

# Getting the **MOST** out of **life** (expectancy)

By Gerard Mullins

Anyone reading the analysis by J Whealy in *Simpson v Diamond*<sup>1</sup> about the life expectancy of Calandre Simpson would understand the complexity involved in projecting an individual's life expectancy. At the ATLA summer convention in Boston last year, Michael Kessler, an attorney from Rosenblum, Roman, Kessler and Sarachan<sup>2</sup> presented an incisive paper that addressed many of the issues a lawyer needs to consider when calculating life expectancy for a catastrophically injured person. The paper that follows is an outline of a more comprehensive paper on the shortened life expectancy defence previously published by Michael.<sup>3</sup> Michael tells me that the unabridged version is available by email request.



## THE FLAWS IN THE PREMISE OF A SHORTENED LIFE EXPECTANCY

What are the flaws in the premise of a shortened life expectancy? It may be argued that a catastrophic brain or spinal cord injury shortens life expectancy, because, it is claimed, such persons are more subject to health risks – for example, skin breakdown, urinary tract infections and respiratory infections or aspiration in the general population. There are significant problems in extending this general premise to a claim that the particular plaintiff in question will not live to a 'normal' life expectancy.

There are three common flaws in the shortened life expectancy argument:

1. Use of inappropriate mortality tables;
2. Failure to account health and morality characteristics of the plaintiff; and
3. Misuse of the literature relating to life expectancy of disabled individuals.

In order to address these flaws, the plaintiff must:

1. individualise the plaintiff and bring out the specific factors that enhance longevity;
2. address the methodological flaws in the reduced life expectancy argument; and
3. most importantly, establish the unpalatable practical consequences of a damages finding premised on 'shortened' life expectancy – that is, that without an adequate recovery the plaintiff will not get the care that is required and a shortened life span will be a self-fulfilling prophecy.

## INDIVIDUALISING THE PLAINTIFF

The theoretical risks listed above are not applicable to every significantly impaired person, so it is critical to evaluate the plaintiff as an individual. For example, the plaintiff may not have a neurogenic bladder and is therefore not subject to an increased risk of a urinary tract infection.

Excess mortality risks are preventable and are largely a function of the quality and quantity of the care provided. With sufficient resources, quality care will, in addition to improving quality of life, also promote a normal or near normal life expectancy. An individual may have characteristics that offset or overcome any potential adverse mortality risk from brain injury sequelae. For example, the plaintiff may not smoke, have low cholesterol, low blood pressure and a favourable family history. The severely

disabled person may not be able to engage in high-risk behaviour. There will also be closer monitoring of health needs, thereby enabling early intervention to address treatable conditions.

### UNDERSTANDING LIFE EXPECTANCY AND MORTALITY TABLES

A mortality table is a compilation of data that reflects the probability of death at a particular age. Life expectancy is the average number of years lived, computed by dividing the total number of years lived by all persons in the mortality table by the number of persons. About half of the people will die before that point and half will die after. It is impossible to predict when a particular individual will die and no mortality table can properly be used to do so.

'The expectation of life is an average figure, and, as such, cannot be used to determine the life expectancy of a particular individual. Similarly, expectation of life cannot be used by the actuary in his calculations of premium rate reserves and other values.'<sup>4</sup>

In contrast to these 'underwriting' tables created by the life insurance industry and regulators to calculate premiums and assure adequate reserves, the US government, for example, publishes general statistics that represent 'life expectancy' data for the population as a whole. The differences between these two types of tables are significant, and the misuse of general government life tables can have a significant adverse impact on life expectancy.

The US government tables that have traditionally been used by the courts do not take into account individual characteristics that are critical in determining mortality risks (for example, whether a person is a smoker). Using these tables therefore artificially shortens life expectancy. General tables are appropriate for assessing the mortality risk of someone for whom there is no data, but not for persons whose particular mortality risks can be assessed.

Standard or so-called 'select' mortality tables utilised by insurers, start out with healthy specimens who have no inherent additional mortality risks such as obesity. Mortality risks – positive and negative – are then evaluated for each individual. Factors that may impair lifespan may be offset or even overcome by other favourable mortality factors, such as good cholesterol.

Anyone who starts out with the general US government tables and then reduces life expectancy based on the plaintiff's injuries is 'double counting' because such tables already include people like the plaintiff and other unrelated health risks. An assessment of life expectancy must start with healthy specimens and include all mortality factors – both positive and negative.

Life tables give a shorter life expectancy than an annuity table. Evaluating damages in a personal injury case is most akin to an annuity, and therefore annuity tables should be used as a starting point in assessing life expectancy.

### ADJUSTING FOR IMPROVEMENTS IN MORTALITY

Mortality tables always look backwards as they are outdated as soon as they are published. For example, life expectancy

has increased 1.0 to 1.5% per year over the last 25 years.

Two adjustments are required to use a mortality table properly. First, an increase in longevity must be made from the time the mortality data are assembled to the present. And, in addition, an adjustment must be made for future improvements in mortality over the remaining projected lifespan. The longevity of catastrophically injured individuals over the past 25 years has improved even more than the general population and it is likely that this trend will continue.

### MORTALITY TABLES VERSUS COHORTS

Mortality tables report the age at death of a huge number of persons. In contrast, a cohort study, widely used in medical research, attempts to match a group of like subjects and follow them over a short period of time. The number of deaths in the study group is compared with the anticipated mortality of the general population, and the 'excess' or 'reduced' mortality is extrapolated into the future. Cohort studies can be used to assess additional risk of past experience, but not for future extrapolation, much less to create an individual life expectancy. To the extent that cohort analysis compares the cohort group against 'general' mortality, it is 'double counting' for the reasons set out above. The validity of cohort analysis is dependent on the size and compatibility of the cohort group and the period of time studied. Cohort data may be less outdated than a traditional >>

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mortality table, but the sample is inevitably much smaller and much more difficult to compare.

### ACCOUNTING FOR THE RISK OF SUBSTANDARD HEALTH

Insurers have a great deal of experience in evaluating the mortality risk of less than fully healthy (substandard risk) individuals and charging an additional premium to compensate for their health. A medical underwriter assigns a percentage increase to account for the additional risk of dying in each year. High blood pressure might carry an additional risk of 200% excess mortality, for example, up to 1,000% or more for other more serious health risks. There is a recognised medical specialty with board certification in insurance medicine devoted to evaluating these risks. Though 200% increased mortality may seem dramatic, most of the consequences of this increased risk do not occur until many years in the future. Doubling the probability of death in each year does not cut life expectancy in half – it merely pushes the bubble of when deaths in the group will likely occur. For example, if the mortality rate for 19-year-old females doubled, but only goes from 1 in 2,000 dying before age 20 to 1 in 1,000 dying, the big changes do not start happening until the later years. Even at 60, doubling the mortality rate means that instead of 99.3% surviving until the next year, 98.46% will survive. Thus, even a ‘conservative’ estimate of 200% or 300% increased mortality risk resulting from the plaintiff’s injuries does not dramatically decrease life expectancy.

### USE AND MISUSE OF LITERATURE ON THE LIFE EXPECTANCY OF TBI PATIENTS

Access to resources and therefore quality care makes a difference in longevity and quality of life. Conversely, it has been reported that a significant percentage of the deaths of severely disabled individuals are associated with deficiencies in health care. Most of the literature commonly used to justify shortened life expectancy fails to account for the effect of sufficient resources to provide not just minimal but the highest level of care. Typically articles by Grossman and Eyman, and more recently, Strauss and Shavelle, will be relied upon to argue that severe brain or spinal cord injury significantly impairs mobility and other functions will dramatically shorten life. However, the nature of the samples, the methodology used, the failure to adjust for individual health characteristics and the quality of care available makes the application of this literature to predicting life expectancy in litigation open to serious question.<sup>5</sup>

### THE STRAUSS-SHAVELLES LITERATURE

Dr Strauss, and his colleague, Dr Shavelle, are statisticians who run the ‘Life Expectancy Project’, which is nominally associated with the University of California at Riverside. Strauss and Shavelle Inc is a separate corporation created for the purpose of providing expert witness services. They also run a website, [www.lifeexpectancy.com](http://www.lifeexpectancy.com), which contains a wealth of material that must be reviewed before analysing the literature. This site also provides a very useful list of cross-examination questions that might be geared to discredit life

expectancy evaluation of severely disabled persons.

The following issues can be raised in respect of the reliability and relevance of the Strauss and Shavelle article, *Long Term Survival of Children and Adolescents after Traumatic Brain Injury*<sup>6</sup> to assessing the life expectancy of the individual at issue in a particular case.

The study involves 946 persons between ages 5 and 21 who had sustained a TBI and all of whom received services from the State of California between 1987 and 1995. Subjects were included if they had either a ‘skull fracture ... or intracranial injury without ... fracture’. There may be significant differences between these conditions. During the study period, 38 subjects died. The survival period was computed from the date of the first evaluation of TBI, even where the survival period after diagnosis of TBI was known to be longer.

The study broke down the total group by levels of mobility, but except for isolated examples, it does not break down the number of deaths in each group. The cause of death is not known in 24 of the 38 deaths reported. It is unknown how many deaths were preventable by good care.

Males were 1.2 times more likely to die than females, and those with no mobility were 3.73 times more likely to die than those with ‘fair’ mobility. Life expectancy for each level of mobility was compared with the 1992 general male population. In addition to double counting, comparison with the male population further exaggerates the difference in life expectancy. Those with ‘fair’ mobility had only a small reduction in remaining life expectancy ranging from 3.5 years less at age 15, to only .3 years at 50.

There are a number of additional considerations that must be evaluated in determining whether the article supports its analysis of life expectancy:

1. The quality of care is not taken into account;
2. With such a small sample and small number of deaths, even one fewer death makes a huge difference in the survival rate, especially when it is extrapolated against the general mortality rate. The number of sub-group deaths is an even smaller sample. Most sub-group data is not presented, but the article does describe the deaths in one sub-group, ‘able to sit unaided’. The group had nine deaths as compared to an ‘expected’ death rate of 4.1 or 2.2 times greater. No methodology or data are presented as to how the expected death rate was determined;
3. Data are presented only for life expectancy to age 50. This could markedly impact ‘life expectancy’ which is an average of the age of death;
4. No data were presented about underlying medical conditions;
5. There is no adjustment for improved mortality either in the past or in the future. The authors concede that the ‘short time span of the study may appear to be a drawback ...’, but then argue that the timeframe makes it more relevant because it involves only more current medical care, ignoring the fact that the subjects go back to the 1960s. The study states that it is useful only as ‘preliminary approximations’.

## ADDRESSING THE SHORTENED LIFE EXPECTANCY ARGUMENT

Without resources for and access to meticulous and expensive care, a shortened life expectancy is a self-fulfilling prophecy and the plaintiff's life will be more restricted and painful. The plaintiff's theme is that care makes a difference, not only in longevity, but in quality of life. In addition to establishing the absence of other risk factors and hopefully good general health, the medical experts should establish the following:

1. Potential conditions that might increase mortality are preventable, treatable or at least manageable, and such management is a direct function of access to high-quality care. Access to high quality care improves both longevity and quality of life. Money, and the access to good care that it makes possible, make a difference;
2. Life expectancy has been increasing and even more so among persons with disability;
3. There is no genetic or other condition present that limits the patient's life expectancy to a particular age;
4. Assuming access to resources to pay for the best medical care, there is no reason why the patient cannot have a normal, or near normal, life expectancy;
5. If the patient does not get enough money to get good care, he/she will have a shortened life expectancy.

At any assumed life expectancy, there is a 50% chance that the plaintiff will outlive the projection. In contrast to an insurer who can take the risk of a life expectancy of a particular individual only because it can pool the risk of a large number of similar individuals, the injured plaintiff has only one opportunity to recover and the catastrophically injured plaintiff alone will bear the consequences of that mistake. He/she cannot make it up in the next case, and should get 'the benefit of the doubt' on life expectancy.

## CHECKLIST TO ESTABLISH A NORMAL LIFE EXPECTANCY

1. The primary care physician, supported by medical records and laboratory tests, can establish good general health, non-smoking status, absence of a history of respiratory and pneumonia, infection or urinary tract infection, the absence of skin breakdown, good blood pressure and normal bowel and bladder function;
2. Family members can also establish good overall health and family history and, if possible, the plaintiff can change position and make his/her needs known;
3. A neurologist and/or physical medical doctor can establish:
  - (i) The absence of seizure disorder, normal bladder and bowel function and so on;
  - (ii) There is nothing inherent in the injury or condition that limits lifespan, indeed some issue (for example, diet, freedom from hazardous behaviour) promote longer lifespan;
  - (iii) Medical problems that might affect longevity are preventable by quality care;
  - (iv) The ability of medical care to manage problems of the severely disabled has dramatically improved;

- (v) Assuming significant resources and rigorous appropriate medical care, the plaintiff is expected to have a normal or near normal life expectancy and could live longer than 'average'. Conversely, if the plaintiff does not have the funds for appropriate care and is 'warehoused', he/she will almost certainly die prematurely;
- (vi) A qualified lifecare planner with experience relevant to the individual's condition can establish the care available and the need to co-ordinate and manage care so that all the patients' needs are addressed and timely interventions can be made before life-threatening conditions arise;
- (vii) An actuary, life underwriter or specialist in insurance medicine can assess the particular risks associated with the plaintiff and establish the appropriate methodology, the proper mortality table and appropriate adjustments to make an appropriate evaluation of life expectancy;
- (viii) Be prepared to address the literature, the qualifications and methodology of any expert expressing an opinion on life expectancy;
- (ix) Establish the consequences of a finding of shortened life expectancy (for example, that inadequate care and premature death is a self-fulfilling prophecy). What will happen to this person if he/she does not get the care that is required? He/she will die prematurely and his/her quality of life will be significantly impaired;
- (x) The final question to any expert asserting as shortened life expectancy should be:
  - (a) Isn't it a fact that even with the life expectancy that you project, 50% of the people just like the plaintiff will live longer than that – in some instances, much longer than 'average'?
  - (b) Do you agree that all of the injuries and conditions that you say shortens the plaintiff's life expectancy were caused by the incident that gave rise to this case?
  - (c) If one accepts that the life expectancy is reduced by a certain period, is there not a 50% possibility that the plaintiff will live longer than your assessed life expectancy and, if so, there will be insufficient funds to care for the plaintiff for that period of time? ■

**Notes:** **1** [2001] NSWSC 925. **2** 110 Great Oakes Office Park, Albany, NY, 12203, M. Kessler at rrkslaw.com. **3** In 31(4) *Trial Law Q.* 50.666 (New York State Trial Lawyers Institute, 2002). **4** CM Sternhill, 'Probability, Mortality and Money Concepts' in Gregg, *Life and Health Insurance Handbook*, 118 (2nd ed. Irwin Pub. 1964). **5** The original article includes significant commentary on an article by Eyman-Grossman, 'Life Expectancy of Profoundly Handicapped People with Mental Retardation', 323(9), *New England Journal of Medicine*, 584 (30 August 1990). The abridged version of this article omits the commentary on the Eyman-Grossman article. **6** 79 *Arch., Phys. Med. Rehabil.* 1095 (September 1998).

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