
Proof of causation: A new approach in cancer cases

Gordon C Wishart¹ and Andrew Axon²

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Abstract

This paper considers the judgments in *JD v MELANIE MATHER* [2012] EWHC 3063 (QB) and *LORETTA OLIVER v GARY WILLIAMS* [2013] EWHC 600 (QB) and how new prognostic models for breast cancer survival can be used by litigants to overcome the perceived injustices created by common law principles of causation established in *Gregg v Scott* [2005] UKHL 2. We consider how the use of epidemiological data in breast cancer cases permits the lawyer to pose the question of how a delay in diagnosis reduces life expectancy and how, in an increasingly high number of cases, that is preferable to the traditional approach of addressing only survival. By applying new statistical data to establish the effect of delay upon life expectancy, the court will be able to avoid apparent injustice without straining yet further established principles of common law causation. More importantly, in many cases for which redress is currently not available, it will better reflect the duty of the treating doctor and the expectations of the patient, something the common law should strive to achieve. This approach was applied in *JD v MELANIE MATHER* [2012] EWHC 3063 (QB) and considered in *LORETTA OLIVER v GARY WILLIAMS* [2013] EWHC 600 (QB).

Keywords

Liability, causation, cancer, life-expectancy

Introduction

The treatment of those suffering from breast cancer has improved dramatically over the last three decades. Consequently, the risk of mortality has fallen and thankfully the majority of patients survive beyond 10 years. As well as improving the efficacy of treatment, advances in medical understanding permit the medico-legal expert to adduce evidence better able to predict the outcome for patients following optimal treatment. It also enables careful analysis of the consequences of sub-optimal treatment caused by delayed diagnosis. This paper considers the value of new prognostic models for breast cancer survival and how these may be used by litigants to address the perceived injustices imposed by common law principles of causation.

Early diagnosis of breast cancer improves the prospects of a favourable outcome. Tumour size and lymph node status are time-dependent factors. One might reasonably assume that any negligent delay in diagnosis, resulting in increased tumour size and nodal involvement constitutes an injury which diminishes the prospects of a good outcome and should therefore sound in damages. Lord Nicholls,

in his dissenting judgment in *Gregg v Scott* [2005] UKHL 2, *paragraph 25*, emphasised this very point:

...If negligent diagnosis or treatment diminishes a patient's prospects of recovery, a law which does recognise this as a wrong calling for redress would be seriously deficient today...

Unfortunately, for many of those involved in cases of delayed diagnosis of breast cancer, redress is not available. This is despite the fact that negligent diagnosis or treatment has reduced the patient's prospects of recovery. Furthermore, a defendant may be fixed with liability for 100% of damages in circumstances where the negligence has only marginally increased the prospect of a poor outcome.

¹Faculty of Health, Social Care & Education, Anglia Ruskin University, Cambridge, UK

²Parklane Plowden Chambers, Leeds, UK

Corresponding author:

Andrew Axon, Parklane Plowden Chambers, 19 Westgate, Leeds LS12RD, UK.

Email: andrew.axon@parklaneplowden.co.uk

This paper is aimed at both medical experts and lawyers. It highlights the use of epidemiological data in breast cancer cases and whether such evidence permits the lawyer to pose a different question, namely one of 'life expectancy'. It also considers the tactical considerations that arise in this type of case.

In circumstances where delay in commencing optimal treatment has reduced the prospects of survival from above 50% to below 50%, the conventional question of 'survivorship' may lead to a better outcome in terms of damages. However, this all or nothing approach carries with it the potential for increased litigation risk and excludes those claimants who never had a better than 50% chances of survival, or more commonly, have a better than 50% chance of survival despite delay.

Can those claimants whose prospects of survival have been reduced from 45% to 25% or from 90% to 70% now seek the redress called for by Lord Nicholls? With advances in the understanding of the pathology of breast cancer and the extent to which delayed treatment may affect an individual's prognosis, the better question to put is, whether a delay in diagnosis has affected life expectancy and/or the need for adjuvant therapy and if so, by how much. This was the approach adopted by Mr Justice Bean in *JD v MELANIE MATHER* [2012] EWHC 3063 (QB).

By addressing the question of life expectancy, the court will be able to avoid apparent injustice without straining yet further established principles of common law causation. It will better reflect the duty of the treating doctor and the expectations of the patient, something the common law should strive to achieve.

In cases of breast cancer, medical science is now well equipped to address, with precision, these issues.

Legal synopsis

In *Gregg v Scott* [2005] UKHL 2, the House of Lords was faced with a case involving certain complexities. Dr Scott negligently diagnosed as innocuous a lump under the left arm of the claimant, Malcolm Gregg. It was in fact cancerous and there followed a nine-month delay in receiving treatment.

During the course of the litigation, the goalposts changed. As originally pleaded, the Claimant suffered non-Hodgkin's lymphoma disease which, if diagnosed nine months earlier, would have been susceptible to treatment with a very high likelihood of cure. Prior to trial, it was discovered that Mr Gregg in fact had a rare type of cancer with a less favourable prognosis such that his chance of recovery with non-negligent treatment was never greater than 42%. The delay in treatment had reduced the prospects of survival further to 25% as assessed at the date of trial.

Accordingly, Mr Gregg advanced his claim on an alternative basis to reflect the reduction/loss of the chance of a favourable outcome. The House of Lords found for the defendant on a 3–2 majority. The 'loss of chance' argument was dealt with definitively by Lord Hoffmann. He accepted well-established principles that past facts are determined on the balance of probabilities while also accepting that when quantifying future loss, the Court will take into account possibilities, even though they do not amount to the balance of probabilities (*Mallett v McMonagle* [1970] AC 166, 167 – *Hoffmann para.67*). However, Lord Hoffmann pointed out that this principle only applies to damage which it is proved will be attributable to the wrongful act. For example, should a claimant suffer an intra-articular fracture which has a 25% risk of degeneration, the claimant will be entitled to 25% of the value of degeneration/surgery occurring. In this example, there can be no doubt that the subsequent degeneration and need for treatment (should they occur) are, on the balance of probabilities, attributable to the original tortious act. Similar principles apply to the recovery of provisional damages. The difficulty for Malcolm Gregg was that, should the adverse event occur (death) it could still not be proved that this was attributable to the defendant's wrongful act.

The difficulty in *Gregg* was that the courts were tasked with determining survival at a specific date as opposed to life expectancy. The question that was posed was whether or not, absent of the negligence of Dr Scott; would Malcolm Gregg have survived to 10 years? That question, answered on the balance of probabilities, was no. For the reasons stated above, this presented Malcolm Gregg with an insurmountable problem. The only possible solution was to couch the claims in terms of a 'loss of chance'. The House of Lords was not willing to adopt a rule which involved abandoning long-standing authority in particular *Wilsher v Essex Area Health Authority* [1988] AC 1074 and *Hotson v East Berkshire Area Health Authority* [1987] AC 750.

Baroness Hale decided with the majority. However, she considered the question of 'life expectancy' as opposed to 'survivorship'. In so doing, she stated as follows:

...there is also a distinct possibility that the delay reduced his life expectancy in the following sense. It is possible that had he been treated when he should have been treated, his median life expectancy then would have been X years, whereas given the delay in treatment his median life expectancy from then is X – Y. This argument requires that the assessment of loss of life expectancy be based on median survival rates: i.e. those to be expected of half the relevant population

at the particular time. If half the men with Mr Gregg's condition would have survived for X years or over with prompt treatment, and half would have survived for less than X years, then X is the median life expectancy of the group. If the same calculation of life expectancy from when he should have been treated is done in the light of the delay in treatment, the median life expectancy may have fallen. There might therefore be a modest claim in respect of 'lost years'...but none of this appears to have been explored before the Judge. This was presumably because the focus before him had been on establishing that the claimant would otherwise have achieved a complete cure. Ignoring for the moment the particular definition of cure adopted in the medical evidence, this would have entitled the claimant to far more in the way of loss of earnings and cost of care than would a claim for a modest reduction in median life expectancy.... (Reference paragraphs 207 and 208)

Some degree of caution needs to be exercised with regard to the use of statistics and in particular how life expectancy is determined. If, for example, medical science restricts us to two outcomes: death within five years or long-term survival, any assessment of a selected individual's life expectancy is artificial. Earlier treatment may increase the likelihood of placing a patient in the latter category but will not provide an indication of life expectancy. In short, we will face precisely those difficulties illustrated by *Gregg v Scott*.

If however, the epidemiological evidence points to a slowing of the progression of the disease or lengthening of remission by the early detection and treatment, a prediction of how long any individual may survive with the benefit of such treatment can be determined. Under these circumstances, the claim can be couched in terms of lost life expectancy, thereby avoiding those problems imposed by the constraints of common law principles.

JD v MELANIE MATHER [2012] EWHC 3063 QBD (Liverpool) (Bean J) 01/11/2012

The Claimant consulted Dr Mather in March 2006 concerning a growth in his groin. Dr Mather wrongly diagnosed a seborrhoeic wart and told the Claimant that there was no reason to worry. The Claimant returned to the surgery more than seven months later and was examined by a different doctor who, realising that the lesion was probably malignant, removed it. It was subsequently discovered that the cancer had spread and the prognosis was now poor. Causation was denied on the established principles of *Gregg v Scott*.

The Claimant's case was that if Dr Mather had made a correct diagnosis, he would have had the tumour

excised within two weeks. Having regard to the predictive factors: the Breslow thickness of tumour; whether the primary tumour was ulcerated; the extent of lymph node involvement and metastatic spread, surgery would have carried a likelihood of cure and survival. Importantly, his alternative case was that excision and treatment in March 2006 would have given him a longer life expectancy.

Mr Justice Bean determined, on the evidence, the tumour was likely to have been 3–4mm thick in March 2006, had already spread to one lymph node and was already ulcerated at this time. That being so, the Claimant's chance of survival (beyond 10 years) when seen in March 2006 was already less than 50%. Although the staging of the cancer had changed for IIIB to IIIC, he never had a better than 50% prospect of cure and his principal claim therefore failed.

However, considering the Claimant's alternative case, taking into consideration the American Joint Committee on Cancer's survival curve table for patients with stage III melanomas, Dr Mather's failure to diagnose the tumour in March 2006 had caused a reduction in the Claimant's life expectancy. The median time for survival at stage IIIB being 7.5 years and stage IIIC being four years. Having regard to the expert evidence, Mr Justice Bean found that the Claimant's life expectancy had been reduced by three years and judgment was entered with damages to be assessed.

LORETTA OLIVER v GARY WILLIAMS [2013] EWHC 600 (QB).

The Claimant suffered from ovarian cancer. She attended her doctor with symptoms of stomach cramps, bloating and diarrhoea. An urgent referral to hospital for further investigations was arranged. The system of referral broke down resulting in a five-and-a-half-month delay before undergoing surgery.

The Claimant argued that more abnormal tissue was left following surgery in July than would have been the case five-and-a-half months earlier in February and that this translated into a diminution in life expectancy. The Judge (Simeon Maskrey Q.C.) found that, on the balance of probabilities, less volume of cancerous tissue would have been left after earlier surgery. However, the Claimant failed to prove a measurable difference in life expectancy. *JD v MATHER* was distinguished because in that case, staging of the melanoma had changed as a consequence of the delay and there was good quality statistical evidence available.

Medical synopsis

Breast cancer is the commonest female cancer with 49,961 new cases in 2010 in the UK.¹ Although the incidence has been rising since the early 1980s, the mortality from breast cancer has been falling since the late

1980s as a result of increased breast cancer awareness, the introduction of specialised breast cancer units, better targeted treatment and the introduction of breast screening.

The 10-year relative survival is now close to 80% in England, but this does not necessarily represent cure from breast cancer as the survival continues to fall beyond 10 years. As a result, the vast majority of patients now survive for 10 years following initial diagnosis and treatment and this can be subdivided into six different prognostic groups according to the Nottingham Prognostic Index which is based on tumour grade, lymph node status and tumour size.² Using audit data from the Cambridge Breast Unit (Figure 1), the top three prognostic groups (Excellent Prognosis Group, Good Prognosis Group, Moderate Prognosis Group 1) have a 10-year survival of close to 90%. Even with a delay in diagnosis, patients in these prognostic groups are unlikely to ever fall below the 50% threshold. The next two groups (Moderate Prognosis Group 2 and Poor Prognosis Group) have 10-year survival of 74% and 65%, respectively, and any delay in diagnosis and treatment could result in these cases falling below the 50% threshold.

However, using the same Cambridge data, together these two intermediate prognosis groups account for only 36.4% of all cases (Table 1) and this effectively excludes the vast majority of cases from ever proving causation using the *balance of probability* principle.

The next issue to be addressed relates to whether 10-year survival is an appropriate time point to determine 'long-term' survival in patients with breast cancer. Unlike many other cancers where significant mortality occurs by five or 10 years after treatment, breast cancer is a relatively slow growing cancer and approximately 65% of patients now survive for 20 years following breast cancer treatment. As a result, there is little evidence to support the choice of 10 years as the most appropriate time point to prove a loss of cure in cases of breast cancer delay. Furthermore, as breast cancer survival continues to increase, more and more patients move further away from the 50% survival threshold and, with continuing developments in breast cancer

Table 1. Distribution of cases by NPI group.

NPI group	Number of cases	Percentage
Excellent	198	11.5
Good	377	21.9
Moderate 1	437	25.4
Moderate 2	389	22.6
Poor	238	13.8
Very poor	84	4.9

NPI: Nottingham Prognostic Index.

Cox survival function for breast cancer (ICD10:C50, excluding Paget's disease and sarcomas) diagnosed at the Cambridge Breast Unit September 1998 - December 2007, adjusted for age at diagnosis

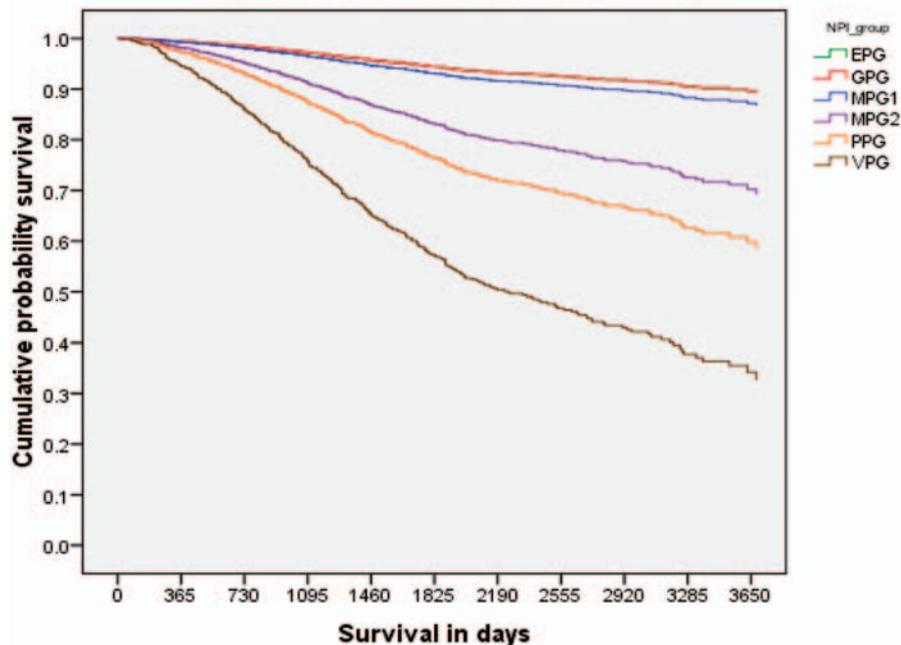


Figure 1. Ten-year overall survival by NPI group.

research and treatment, the proportion who would fail to prove causation on the all or nothing principle will also increase.

Prognostic factors in breast cancer

Known pathological prognostic factors that retain independent significance on multivariate analysis include tumour size, tumour grade and lymph node status. Other prognostic factors, and factors that predict response to therapy, include oestrogen receptor (ER), progesterone receptor (PR) and HER2 status. Tumour size and lymph node status are time-dependent factors and larger breast cancers are more likely to be lymph node positive and have a worse survival. Factors that are related to tumour biology, including tumour grade and receptor status, do not change over time.

Prognostic models

There are two predictive models that can estimate survival following surgery and adjuvant therapy for breast cancer. Adjuvant (www.adjuvantonline.com) is a US web-based prognostication and treatment benefit tool for early breast cancer. The mortality estimates used in Adjuvant are based on 10-year observed overall survival of women aged 36–69 who were diagnosed between 1988 and 1992 and recorded in the Surveillance, Epidemiology and End Results (SEER) registry.³ Predict (www.predict.nhs.uk) is an online prognostication and treatment benefit tool recently developed in the UK by a Cambridge research group, based on 5694 women diagnosed in East Anglia from 1999 to 2003,⁴ which provides five- and 10-year survival estimates with and without treatment benefit predictions that are equivalent to Adjuvant.⁵

The Predict model is based on a proportional hazards model that combines the effect of individual prognostic factors (tumour size, tumour grade, lymph node status, mode of detection, ER status, HER2 status) on breast cancer survival at five and 10 years following surgery. Both Adjuvant and Predict also estimate the benefits of chemotherapy and hormone therapy for individual patients, and survival estimates are within 1.3% and 0.7% of observed survival, respectively.⁵ Adjuvant does not currently include HER2 status, but a new version of Predict that does include HER2 was launched in October 2011.⁶

The Breast Cancer Outcome Calculator (BCOC) is an online oncology tool (www.CancerMath.net) that provides survival and mortality estimates for breast and other cancers.⁷ It is based on observed breast cancer outcomes for US patients treated from 1987 to 2007 and takes into account treatment received but may underestimate the treatment benefit of Herceptin and

modern chemotherapy regimens which only came into routine use around 2005–2006.

CancerMath is a mathematical model of breast cancer mortality based on the SNAP (Size + Nodes + Prognostic markers) method, which can be used to integrate information on tumour size, nodal status and other prognostic factors into an estimate of the risk of cancer death for each patient,^{8–10} presented as the 15-year Kaplan–Meier death rate. These values are then combined with the risk of non-cancer death, based on the U.S. National Vital Statistics Reports,¹¹ to compute the expected cumulative incidence of both cancer and non-cancer death at each of the first 15 years. The model also provides mean life expectancy estimates based on the patient's age and prognostic factors.

The model has been validated in two large datasets, including 453,694 patients in the SEER dataset and 12,327 patients diagnosed at the Massachusetts General and Brigham and Women's Hospitals from 1968 to 2007 and has been shown to provide mortality estimates that are within 2% of actual results.

Example I

To illustrate how the prognostic models work, a fictitious case is presented. A 43-year-old patient presents in March 2007 with a lump in her left breast, and following surgery she is diagnosed with a 37-mm grade three invasive carcinoma that has four positive axillary lymph nodes and is ER positive and HER2 negative. But for a 17-month delay in diagnosis, she would have presented with a screen-detected impalpable 12-mm grade 3 tumour that was node negative, ER positive and HER2 negative at age 42. The 10-year overall survival estimates from Adjuvant and Predict, taking into account the benefit of adjuvant chemotherapy and hormone therapy at both time points, are shown in Table 2. As can be seen, the estimates from both models are very similar and show a significant decrease in 10-year survival as a result of the delay in diagnosis, but neither estimate falls below the 50% threshold.

If the same data is entered into the BCOC, then the 15-year survival is just less than 90% with a breast cancer mortality of 8.4%. This also shows that this cancer shortens the life expectancy of this patient by 2.8 years (from 40.1 to 37.3 years).

This survival estimate can now be compared with the estimate from the later time point. With enlargement of the tumour, and spread to the axillary lymph nodes during the 17-month delay, the 15-year breast cancer mortality has increased to 43.2% with a 15-year survival of just over 50%. In addition, the more advanced cancer now shortens the life expectancy of this patient by 14.2 years (from 39.2 to 25.0 years).

Table 2. Ten-year survival following surgery, chemotherapy and hormone therapy.

	Adjuvant!	Predict
October 2005	93%	93%
12 mm		
Grade 3		
Node negative		
ER positive & HER2 negative		
Age 42		
March 2007	64%	63%
37 mm		
Grade 3		
4 nodes positive		
ER positive & HER2 negative		
Age 43		

However, loss of 11.4 years of life is likely to be much more relevant to a patient with only 15 years to live as opposed to a patient with 30 years to live. As a result, the lost years of life can be presented as a proportion of the life expectancy for a woman of the same age without breast cancer. In this example, the lost years (11.4 years) would be expressed as a percentage of the life expectancy of a 43-year-old woman without breast cancer (39.2 years) to give a figure of 29%. This means that this patient has lost 29% of her life expectancy as a result of the 17-month delay in diagnosis, and this figure could form the basis of a proportional award in compensation for the negligent act that led to the delay in diagnosis.

Example 2

In the second example, a 40-year-old patient presents with a 40-mm grade 3 invasive carcinoma that has 10 positive axillary lymph nodes and is ER positive and HER2 negative. But for a delay in diagnosis, she would have presented with a 32-mm grade 3 tumour that was eight nodes positive, ER positive and HER2 negative at age 38. The 10-year overall survival estimate from Predict, taking into account the benefit of adjuvant chemotherapy and hormone therapy at both time points, are shown in Table 3. As can be seen from the estimates at both time points, the figures are very similar to Gregg and Scott with a significant decrease in 10-year survival from 46% to 26% as a result of the delay in diagnosis, but both estimates lie below the 50% threshold.

If the data from the earlier time point is entered into the BCOC, it shows that this cancer shortens the life expectancy of this patient by 22.0 years (from 43.9 to 21.9 years). Using data from the actual time of diagnosis shows that the cancer shortens the life expectancy by 23.7 years (from 42.0 to 18.3 years). Therefore, the shortening

Table 3. Ten-year survival following surgery, chemotherapy and hormone therapy.

	Predict 10-year survival	Shortening of life expectancy
40 mm	26%	23.7 years
Grade 3		
10 nodes positive		
ER positive & HER2 negative		
Age 40		
32 mm	46%	22.0 years
Grade 3		
8 nodes positive		
ER positive & HER2 negative		
Age 38		

Table 4. Ten-year survival following surgery, chemotherapy and hormone therapy.

	Predict 10-year survival	Shortening of life expectancy
41 mm	49%	10.6 years
Grade 3		
3 nodes positive		
ER negative & HER2 negative		
Age 55		
35 mm	54%	9.9 years
Grade 3		
3 nodes positive		
ER negative & HER2 negative		
Age 55		

in life expectancy as a result of the delay in diagnosis in this particular example is 1.7 years (23.7–22.0).

In this example, the lost years (1.7 years) could be expressed as a percentage of the life expectancy of a 40-year-old woman without breast cancer (42.0 years) to give a figure of 4%.

Example 3

In the final example, a 40-year-old patient presents with a palpable 41-mm grade 3 invasive carcinoma that has three positive axillary lymph nodes and is ER negative and HER2 negative. But for a delay in diagnosis, she would have presented with a screen-detected 35-mm grade 3 tumour that was three nodes positive, ER negative and HER2 negative at the same age. The 10-year overall survival estimate from Predict, taking into account the benefit of adjuvant chemotherapy and hormone therapy at both time points, are shown in Table 4. As can be seen from the estimates at both

time points, the delay in diagnosis has resulted in a modest reduction in 10-year survival of only 5%, but the survival now lies below the 50% threshold.

Using the same calculations used in the previous examples, if the cancer had been diagnosed at the earlier time then this cancer would shorten the life expectancy by 9.9 years (from 28.3 to 18.4 years), but as a result of the delay in diagnosis, it shortens the life expectancy by 10.6 years (from 28.3 to 17.7 years). Therefore, the shortening in life expectancy as a result of the delay in diagnosis in this particular example is 0.7 years (23.7–22.0) or 2.5% of the average life expectancy for a 55-year-old woman.

Use of life expectancy in other cancers

Most malignancies have improved survival when detected at an earlier stage, as they are less likely to have metastasised to distant organs, and are therefore more amenable to curative treatment. As with breast cancer, the CancerMath team has developed survival and life expectancy models for carcinoma of the colon, renal cell carcinoma, melanoma and head and neck cancer so that lost years as a result of delay in diagnosis can be calculated. Although the CancerMath models for these tumours are based on cancer and non-cancer mortality rates from the US, they can serve as a useful guide to estimate reductions in survival and life expectancy with any delay in diagnosis. At present, there is no UK-based cancer model that can estimate life expectancy although Predict could be revised to provide this data for breast cancer based on UK cancer and non-cancer mortality rates.

A common misconception is to treat five-year cancer survival rates as ‘cure’ rates. The simple fact is that for the majority of cancers, the survival continues to fall beyond five years from diagnosis. An exception to this rule is testicular cancer, where five-year survival is high for all stages of the disease and does represent a ‘cure’ rate for this particular cancer.

In theory, it should be possible to construct mathematical models for most types of malignancy. In general, however, it is easier to develop outcome models for solid tumours where survival is based on the tumour size, tumour differentiation and lymph node status as well as specific prognostic factors for each tumour. In future, it should therefore be possible to develop further survival and life expectancy models for common malignancies based on UK cancer and non-cancer mortality data.

Practical issues

A number of practical issues fall to be considered by the lawyer instructed by a Claimant in this situation.

The nature and quality of the available statistical information

Careful analysis of the statistical data is required. Although the use of epidemiological statistical data is familiar to the courts to determine reduced life expectancy (ref: Baroness Hale, *Gregg v Scott* [2005] UKHL 2 paragraph 207 and 208; *JD v MELANIE MATHER* [2012] EWHC 3063 (QB), care must be adopted. Historically, small cohorts of patients have been used. Although these studies may provide an indication of a statistical outcome, they do not necessarily translate to a specific outcome for an individual. The validated data, given below, result from a study of many thousands of patients. Its purpose is to predict the outcome in terms of life expectancy of an individual with breast cancer, based on their age and prognostic indicators.

Survivorship or lost years

A tactical decision falls to be made whether or not to approach a case on the basis of survivorship or lost years. This is a theme running through all of the cases discussed in this paper. It should be recognised that damages on an all or nothing basis to reflect a cancer death will inevitably be higher than damages recoverable for lost years. However, for the reasons explained above success or failure will depend upon which side of the 50% chance of cure the Claimant falls before and after culpable delay. As in the case *JD v MATHER*, this can be determined on a question as narrow as whether the lesion was ulcerated at the date of examination or not. The three worked examples in this paper illustrate the difficulties (Table 5).

In the first example, if the question is based on survivorship, it is difficult to see how the Claimant would prove her loss at the date of trial. On the balance of probabilities, she will survive regardless of the negligence. Although the Claimant could argue that *Gregg v Scott* is distinguishable on the basis that her death, should it occur, would on balance be attributable to delay, she will nevertheless have to overcome the policy considerations considered in detail by Baroness

Table 5. Survivorship versus life expectancy.

	10-year survival with optimal treatment (%)	10-year survival without optimal treatment (%)	Reduced life expectancy
Example 1	93	64–63	11.4 years
Example 2	46	26	1.7 years
Example 3	54	49	0.7 years

Hale (*Gregg v Scott* [2005] UKHL 2 paragraph 210 and 226). Resurrecting arguments for recovery of damages based on loss of chance would, at best, be highly speculative. A claim based on lost years is clearly made out and would under these circumstances be preferable. With improving treatment and better outcomes, it is this type of case that will become increasingly common.

In the second example, the claim would fail if presented on the basis of survivorship (*Gregg v Scott*). Although the damages in terms of lost years would be modest, the Claimant would nevertheless succeed.

In the third example, the claim would succeed on a conventional basis. The Claimant would undoubtedly be best placed adopting a conventional approach. This is a striking example of where the injustice lies for the Defendant. Statistically, the delay has deprived the Claimant of eight months of life expectancy, although the Defendant will be required to meet the value of the claim in full.

Damages for lost years

Although the concept of an award for general damages to reflect reduced life expectancy is recognised (section 1(b) of the Administration of Justice Act 1982), there is a paucity of authority as to the value of such a claim. Much of the reported case law includes damages to reflect the process causing the death, such as mesothelioma. In circumstances where the damages are claimed for lost life expectancy, these comparators are of only limited assistance. It is likely that in this area, a case law will therefore evolve (reference: McGregor on Damages, paragraph 35–268).

Claims for loss of earnings during lost years are also permissible. Most recently, this head of loss was revisited by the courts in *Whipps Cross University v Iqbal* [2007] EWCA Civ 1190 (*Croke v Wiseman and Pickett v British Steel* – considered). Damages are conventionally based upon 50% of net earnings after allowance is made for the Claimant's costs of subsistence.

Fatal Accidents Act claims

In circumstances where a spouse is entitled to a bereavement award and the Claimant has dependants, consideration needs to be given to whether settlement is best delayed or not. Settlement before death precludes a claim brought under the Fatal Accidents Act and a degree of caution is therefore required (Reference: *Thompson v Christine Arnold* [2007] EWQB 1875 Langstaff J). The decision as to the best approach will depend upon the evidence and the attitude of the Claimant. Practical guidance as to the approach to be adopted in circumstances where death is both likely and imminent can be found in *Boden v Crown House*

Maintenance and (2006) QBD (Master Whitaker) 24/05/2006.

Discussion

The arguments presented in this paper provide support for a move from an all or nothing assessment of loss of 10-year survival to a more proportional estimate of injury based on a shortening of life expectancy. While the statistics used in *Gregg and Scott* were very rudimentary, modern prognostic models for breast cancer are based on integrated mathematical models that take into account known prognostic factors.^{3–7} Furthermore, these models have been validated in external datasets and both Adjuvant and Predict provide survival estimates that are within 1.3% and 0.7% of observed survival, respectively. These models can therefore provide more robust and reliable estimates on which loss of survival can be quantified in cases of breast cancer delay.

Currently, the only model that provides loss of years of life expectancy data is the BCOC which is based on US data from the SEER database. Ideally, a breast cancer prognostic model based on contemporary UK data that provides similar statistics to the BCOC could support a move to loss of life expectancy as an actionable injury on which to base breast cancer clinical negligence claims in the UK.

Another past criticism of loss of chance principle is the opening of floodgates and an increase in overall compensation payouts for cases of proven clinical negligence. There are a number of reasons why this criticism can be countered in the specific case of breast cancer. First, breast cancer has led the way in prognostic models to estimate outcome and the authors are not aware of any other cancers that would allow such a paradigm shift in causation and quantification of claims. Second, use of a proportional compensation principle will mean that claimants who previously could prove a fall to below 50% in 10-year survival would receive 100% of the standard compensation for this injury. With a proportional scheme, their compensation would increase pro rata based on lost years of life but is unlikely to reach 100%, thereby reducing the overall level of claims. Of course there is still room for debate about the definition of a significant percentage loss of life expectancy, and it is possible that a lower limit threshold could be set below which no compensation would be paid at all.

Breast cancer often leads the way in defining new pathways for research and treatment and by a collaborative approach between scientists and clinicians, the development of statistical prognostic models that provide highly accurate survival estimates has been a major breakthrough in both prognostication and the selection

of optimal therapy following surgery for breast cancer. As previously discussed, similar models are now available for kidney and colon carcinoma as well as melanoma. There is no reason whatsoever why these same models cannot allow a similar collaboration between clinicians and the legal profession to provide accurate life expectancy estimates for patients who have suffered a delay in breast cancer diagnosis. Such a collaboration could lead to a major paradigm shift in both the way that causation is proven but in quantification of the loss that has been incurred and lead to a new era in the assessment of clinical negligence claims for breast and other cancers.

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Conflict of interest

None declared.

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