IN THE COURT OF APPEAL OF THE REPUBLIC OF SINGAPORE

[2019] SGCA 75

Civil Appeal No 70 of 2018

Between

ARMSTRONG CAROL ANN (EXECUTRIX OF THE ESTATE OF TRAYNOR PETER, DECEASED AND ON BEHALF OF THE DEPENDENTS OF TRAYNOR PETER, DECEASED

… *Appellant*

And

(1) QUEST LABORATORIES PTE LTD
(2) TAN HONG WUI

… *Respondents*

Civil Appeal No 71 of 2018

Between

TAN HONG WUI

… *Appellant*

And

ARMSTRONG CAROL ANN (EXECUTRIX OF THE ESTATE OF TRAYNOR PETER, DECEASED AND ON BEHALF OF THE DEPENDENTS OF TRAYNOR PETER, DECEASED

… *Respondent*

Civil Appeal No 72 of 2018

Between

QUEST LABORATORIES PTE LTD

… *Appellant*

And

ARMSTRONG CAROL ANN (EXECUTRIX OF THE ESTATE OF TRAYNOR PETER, DECEASED AND ON BEHALF OF THE DEPENDENTS OF TRAYNOR PETER, DECEASED

… *Respondent*

In the matter of Suit No 82 of 2015

Between

ARMSTRONG CAROL ANN (EXECUTRIX OF THE ESTATE OF TRAYNOR PETER, DECEASED AND ON BEHALF OF THE DEPENDENTS OF TRAYNOR PETER, DECEASED

… *Plaintiff*

And

(1) QUEST LABORATORIES PTE LTD
(2) TAN HONG WUI

… *Defendants*

JUDGMENT

[Tort] — [Negligence] — [Duty of care]— [Breach of duty]
[Tort] — [Negligence] — [Causation] — [Tests for causation]
[Evidence] — [Interpretation] — [Statistical and probabilistic evidence]
[Civil Procedure] — [Experts] — [Presentation tools]
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[2019] SGCA 75

Court of Appeal — Civil Appeals Nos 70, 71 and 72 of 2018
Sundaresh Menon CJ, Andrew Phang Boon Leong JA, Judith Prakash JA, Tay Yong Kwang JA and Belinda Ang Saw Ean J
21 January 2019

26 November 2019 Judgment reserved.

Andrew Phang Boon Leong JA (delivering the judgment of the court):

Introduction

1 In a case we heard barely two years ago, *ACB v Thomson Medical* [2017] 1 SLR 918 ("*Thomson Medical*"), we were concerned with assisted reproduction and medicine's ability to help bring life into the world. In these appeals, we are concerned with medicine's ability to detect cancer, and which the appellant ("the Appellant") contends would have averted death. Scientific advances can ameliorate illness and even extend life when it was heretofore impossible, but by that same token medicine's promise of health and healing can amount to nought if we fail to capitalise on it. As has been aptly observed: "The paradox at the heart of [modern] medical care is that it works so well, and

yet never well enough" (see Dr Atul Gawande, *Better: A Surgeon's Notes on Performance* (Picador, 2007), at p 105).

2 These cross-appeals are brought against the decision of the High Court judge ("the Judge") in *Armstrong, Carol Ann (executrix of the estate of Peter Traynor, deceased and on behalf of the dependents of Peter Traynor , deceased) v Quest Laboratories Pte Ltd and another* [2018] SGHC 66 ("the Judgment"). The Appellant, Ms Carol Ann Armstrong, as executrix of the estate of her husband, Mr Peter Traynor ("Mr Traynor") and his dependents, has sued the respondents, Quest Laboratories Pte Ltd ("Quest") and Dr Tan Hong Wui ("Dr Tan") (collectively, "the Respondents"), in the tort of negligence, alleging a misdiagnosis of Mr Traynor, who ultimately died from melanoma. The next issue which arises is whether such negligence *caused* damage to Mr Traynor.

3 As to this last mentioned issue of causation, the Judge appeared to rely on the minority's decision in *Gregg v Scott* [2005] 2 AC 176 ("*Gregg v Scott*"), where the House of Lords by a majority of three to two held that a claim for damages in clinical negligence would be resolved on a balance of probabilities that the defendant's breach was not the cause of the adverse consequences. Conversely, the minority of Law Lords were prepared to have recourse to the "loss of a chance" doctrine, and to hold that the alleged negligence resulted in the reduced prospects for treatment.

4 The Appellant has two legal strings to her bow. The first (and primary) string is that she is entitled to damages because the alleged negligence of the doctor resulted (on a balance of probabilities) in the loss of a *complete cure* for Mr Traynor. This resulted in his death. Her position was also that since Mr Traynor's initial prospects had been reduced from 77 per cent (above 50 per cent) to effectively zero, this should be regarded on a balance of

probabilities as amounting to a complete cure, thus justifying a *full* award. The Appellant's second (and fall-back) position is that the alleged negligence resulted in the *reduced prospects* of a cure. The Appellant sought a proportionate award of this reduction in prospects. The Respondents, on the other hand, submitted that a reduction in prospects is not a recognisable head of damage in the law of negligence.

Brief overview

5 In September 2009, Mr Traynor discovered a bloodstain on his shirt while changing. Mr Traynor consulted his general practitioner, who undertook a shave biopsy of a mole on Mr Traynor's back. The specimen was sent to the Respondents who returned a pathological report indicating that this was an "[u]lcerated intradermal naevus" and concluding that "[t]here is no malignancy". It transpired that the mole on Mr Traynor's back was, in fact, a malignant melanoma. Shortly after Christmas in 2011, Mr Traynor discovered a lump under his right armpit while getting dressed. A biopsy of his lymph nodes under his right armpit (*ie*, his axillary lymph nodes) revealed metastatic melanoma. Despite repeated medical procedures and multiple rounds of chemotherapy, Mr Traynor passed away from metastatic melanoma in December 2013 at the age of 49. Mr Traynor left behind his wife, the Appellant, Ms Armstrong, and their daughters, Kate and Emily, who were aged 10 and 12, respectively, at the time of their father's death.

The parties' cases and the decision below

6 The Appellant claims that the Respondents had breached their respective duties of care in misdiagnosing her husband's malignant melanoma in September 2009 ("the Breach Question"). The Appellant further claims that the Respondents' alleged breach ultimately caused Mr Traynor to pass away from

metastatic cancer at the age of 49, when he would have otherwise lived to the age of 82 ("the Causation Question").

7 The Judge considered the answer to the Breach Question "straightforward and obvious". He was unquestioningly of the view that the Respondents had breached their respective duties of care. The Judge held that the Respondents had simply been negligent in sending a pathology report indicating a clean bill of health to Mr Traynor when the circumstances required at least further examination on their part (see the Judgment at [8]).

8 However, the Judge's answer to the Causation Question was more complex. The Respondents claimed that even prior to September 2009, Mr Traynor's fate was "biologically determined" as melanoma had already seeded into his distant organs via his bloodstream. The Judge rejected the Respondents' explanation, which explanation was, however (and as we shall see), pursued vigorously in the appeal before this court.

9 On the other hand, the Appellant suggested that Mr Traynor would have availed of surgical treatment that would have cured him. In the alternative, she presented statistical evidence suggesting that at the point of the Respondents' alleged misdiagnosis in September 2009, Mr Traynor's melanoma would have been what is known in the large scale studies as "Stage IIIB". The Appellant contended that patients with Stage IIIB melanoma would have a 77 per cent chance of surviving ten years, which she claimed the law should treat as "equivalent to a cure". In this regard, the Judge appears to have rejected the Appellant's claim for a cure. As the Judge put it, Mr Traynor "might have been among the minority in the data. In other words, no one can be sure that Peter Traynor was not the black swan of melanoma" (see the Judgment at [15]).

10 The Judge declined to follow the majority's ruling in *Gregg v Scott* and held that "if this case should indeed turn on the law", he was emphatically on the side of the minority Law Lords in *Gregg v Scott* (comprising Lord Hope of Craighead and Lord Nicholls of Birkenhead) and that he would "leap an evidentiary gap when overall fairness plainly so requires" (see the Judgment at [16]).

11 Although he was of the view that the Respondents' alleged breach had caused Mr Traynor to "lose a fighting chance", the Judge declined to accept statistical evidence that Mr Traynor would have an at least 68 per cent chance of surviving 10 years. Instead, following from the minority's judgment in *Gregg v Scott*, he opted to "leap where Lord Nicholls had leapt" and estimated that if not for the said breach, Mr Traynor would have lived for four more years from 2013. In so doing, the Judge remarked that the present case had a stronger claim based on the "lost years" argument as presented in *Gregg v Scott*. The Judge considered that the "lost years" were four years' worth of Mr Traynor's life expectancy (see the Judgment at [19]). At this juncture, we would note that even though the Judge had recourse to the reasoning of Lord Nicholls and Lord Hope in *Gregg v Scott*, the award that he had made was couched in terms of the number of years lost (*ie*, four years of Mr Traynor's life expectancy). It is therefore, with respect, not entirely clear to us if the basis of the Judge's award as to these "lost years" was predicated on the loss of a chance doctrine, or on a claim for a loss of expectation of life (as a matter of loss of income) under section 11 of the Civil Law Act (Cap 43, 1999 Rev Ed).

12 Having considered that causation was established in the manner set out above, the Judge proceeded to consider the amount of the award ("the Damages Question"). The Appellant had claimed under a Dependency Claim for benefits the dependents would have received from Mr Traynor, a Loss of Inheritance

Claim for the sums she would have inherited from Mr Traynor, a Loss of Appreciation Claim for the decline in value to the Traynor family's home, and the Estate Claim for medical, funerary, out of pocket, grant of probate expenses as well as damages for bereavement, pain and suffering. The Appellant suggested that Mr Traynor's annual income would have been $450,000.

13 Conversely, the Respondents had submitted that if causation was proved, there should be a discount rate applied to the multiplier-multiplicand. They also submitted, among other things, that the Dependency Claim and Inheritance Claim should be calculated together, and that Mr Traynor's annual income would not have been $450,000.

14 The Judge rejected the Respondents' submissions that the multiplier-multiplicand for the Dependency and Inheritance Claims should be determined together, and that Mr Traynor's annual income would have been lower than $450,000 (see the Judgment at [23] and [35]). He also held that as Mr Traynor would not have lived to his full life expectancy, but would instead have lived four more years, this would have brought the claim exactly to the date of trial. As such, it was not necessary to make a finding on the multiplier-multiplicand and he also dismissed the Loss of Appreciation and the Estate Claims.

15 In so far as the Dependency and the Loss of Inheritance Claims were concerned, the Judge accepted the amounts claimed by the Appellant up to four years' worth for each Claim, but held that the Appellant had failed to prove that the value of the benefits to herself and her daughters out of the Traynor family's annual expenses were of the conventional percentages laid down in precedents and therefore removed this amount from the Dependency Claim, awarding Mr Traynor's dependents $346,677 (see the Judgment at [24]–[26]). The Appellant was also awarded $894,657 for the Loss of Inheritance Claim (see the

Judgment at [32]–[38]).

16 Before us, the Appellant appeals against the Judge's findings on the Causation and Damages Questions, as follows.

17 First, the Appellant claims that if not for the Respondents' misdiagnosis, Mr Traynor would have availed himself of the appropriate medical procedures such that he would have been "cured" or effectively cured. In the court below, the Appellant had initially also claimed in the alternative for "loss of a chance", but in her closing submissions she stated that it was no longer necessary for her to rely on the loss of a chance claim, as it was her view that Mr Traynor's 77 per cent "chance of survival" under the law was tantamount to a cure.

18 During the hearing, Mr Edmund Kronenburg ("Mr Kronenburg"), counsel for the Appellant, confirmed that although his primary position was that Mr Traynor would have been cured, his secondary position was that, according to the statistical evidence, the Appellant should nevertheless succeed on her claim for the loss of a better medical outcome leading to a proportionate award.

19 Second, it was the Appellant's case on the Damages Question that, following from her submission on a "cure", damages should have been awarded for Mr Traynor's full life expectancy up until the age of 82. Accordingly, the Loss of Appreciation and Estate Claims should be reinstated, while the Dependency and Loss of Inheritance Claims should have been calculated according to Mr Traynor's full life expectancy. It was also her case that the Judge had erred in not awarding the full amount in relation to the Dependency Claim.

20 In contrast, the Respondents submitted that the Judge had erred in finding them liable for a breach of duty (see [7] above). It was also the Respondents' case that even if they had been in breach, there was no causation established inasmuch as there had not been a loss of an early opportunity for treatment. In the further alternative, the Respondents submitted that if they were found liable in negligence, damages should nevertheless be calibrated downward as the Dependency and Loss of Inheritance Claims should be computed collectively and awarded as a single award, and that damages in relation to Mr Traynor's estimated income should be reduced.

Background facts

21 On 24 December 2008, Mr Traynor consulted his general practitioner, Dr Christopher Huang Chia Yung ("Dr Huang"), about a mole on his back. Dr Huang's clinical notes indicated that the mole had no change for years.

22 Sometime in September 2009, Mr Traynor noticed a bloodstain on his shirt while he was changing. On 12 September 2009, Mr Traynor consulted Dr Huang again. This time, a procedure known as a "shave biopsy" was performed on the mole, which removed the portion of the mole on the skin. The biopsied specimen was sent to the 1st Respondent, Quest, for an examination and preparation of a pathology report. It is undisputed that this mole was the "primary tumour" (*ie*, where all the melanoma originated from).

23 It is this specimen from September 2009 that was the critical focus in the trial below. The 2nd Respondent, Dr Tan, a consultant pathologist from Quest, testified that the practice would have been to embed the specimen into a paraffin block. The block would be thinly sliced into cross sections and placed onto a single glass slide. On 14 September 2009, Dr Tan was given four thinly

sliced and stained tissue sections of the specimen in a glass slide ("the original slide") for examination under microscopy. The original slide was accompanied by a clinical request form from Dr Huang.

24 After examining the original slide, Dr Tan issued a pathology report ("the 2009 pathology report"). In his pathology report, Dr Tan described the relevant findings as follows:

> MICROSCOPIC DESCRIPTION
>
> The specimen is a piece of skin with nests of naevus cells in the dermis. There is overlying ulceration. The naevus cells exhibit benign polarity and are devoid of junctional activity, atypia or mitotic activity. The naevus cells reach the resection margin. **There is no malignancy**.
>
> DIAGNOSIS
>
> SKIN LESION, BACK
>
> Ulcerated intradermal naevus.
>
> [emphasis added in bold; underlining in original]

25 The 2009 pathology report was sent to Dr Huang on 16 September 2009. The Appellant stated that Mr Traynor had received a copy of the report, and was advised on its contents by Dr Huang. They understood the 2009 pathology report to mean that the mole was not cancerous. It does not appear that any further action was taken by Mr Traynor.

Facts pertaining to the Causation Question

26 Some two years later, around Christmas in 2011, Mr Traynor discovered a lump under his right armpit while getting dressed. Mr Traynor consulted another general practitioner, and was recommended to undergo a biopsy. On 6 January 2012, Mr Traynor underwent a Computed Tomography ("CT") scan, a core biopsy, and a Positron Emission Tomography ("PET") scan. The biopsy

revealed that the lymph nodes under Mr Traynor's armpits had metastatic melanoma. The CT scan showed adenopathy (*ie*, swelling) under Mr Traynor's right and left armpits, which was confirmed by the PET scan. However, the PET scan showed no definite evidence of distal metastasis (*ie*, cancer in the distant organs). Mr Traynor was placed on four rounds of chemotherapy, starting on 16 January 2012.

27 On 9 April 2012, PET and CT scans continued to show stable lymphadenopathy (disease of the lymph nodes) and that distal metastasis was not detected. On 19 April 2012, Mr Traynor underwent a "bilateral axillary clearance", *ie*, the removal of the right and left lymph nodes under the armpit. The removed lymph nodes were examined by a pathologist, Dr Fong Chee Meng ("Dr Fong"). Dr Fong noted as follows:

(a) Four of the right lymph nodes contained metastatic melanoma. "[O]ne [was] completely replaced by tumour while the remaining three show[ed] focal melanoma cells". The largest right lymph node measured 6cm x 4.5cm x 3.5cm; and

(b) One of the left lymph nodes was "completely replaced by metastatic melanoma with epithelioid and spindle morphology" and measured 5cm x 3.5cm x 2cm.

28 It is undisputed that the bilateral axillary clearance on 19 April 2012 had removed the lymph nodes and the melanoma there. Also on 19 April 2012, Mr Traynor underwent a "wide excision" of the primary site of the tumour, *ie*, a removal of the skin where the mole was to remove any residual disease there. The wide excision showed there was no residual tumour in the primary site.

29 We pause to note that, at the trial, it was eventually undisputed that the shave biopsy in 2009 had removed the primary tumour from the primary site. Dr Nigel Kirkham ("Dr Kirkham"), the expert pathologist for the Appellant, had confirmed that if there had been some primary tumour left, this would have continued growing in the nodule. However, since the 2012 wide excision showed no residual tumour, this must have meant that in 2009 all of the primary tumour had been removed.

30 After the wide excision and bilateral axillary clearance procedures on 19 April 2012, Mr Traynor underwent adjuvant chemotherapy. CT and PET scans were performed for subsequent monitoring on 25 June and 8 November 2012, both of which showed no detectable melanoma. In April 2013, there was "some suggestion that the cancer had relapse[d]. [But], this was not definite".

31 On 30 August 2013, the PET and CT scans showed that there were nodule growths in Mr Traynor's body suspicious of metastatic deposits. On 2 September 2013, Mr Traynor was restarted on chemotherapy. On 14 October 2013, the PET and CT scans confirmed that distal metastasis had grown relative to the August 2013 scans in some regions.

32 Mr Traynor subsequently passed away on 6 December 2013. The Appellant's expert oncologist, Professor William McCarthy ("Prof McCarthy"), testified that when Mr Traynor passed away, he had about 30 metastatic nodules about 3mm in size throughout his body.

Facts pertaining to the Breach Question

33 Concurrently, a number of events were occurring which were relevant to the Breach Question. When the core biopsy on 6 January 2012 revealed

metastatic melanoma in Mr Traynor's right axilla lymph node, the original slide from 2009 was recalled.

34 On 30 January 2012, Dr Fong examined this original slide and issued the following findings ("Dr Fong's pathology report"):

> …
>
> MICROSCOPY
>
> The slide shows ulcerated skin with a tumour composed of atypical spindled and epithelioid cells which have vasicular oval to irregular nuclecii, distinct nuclecii and pale eosinophilic cytoplasm. These atypical naevus cells are arranged in sheets and tightly packed clusters or nests. Mitoses are present. There are a few cells with fine brown pigment. A junctional component is identified. The tumour is transacted at the base. Tumour thickness to transacted base is 1.0mm.
>
> DIAGNOSIS
>
> Submitted Slide, Skin Biopsy:
>
> **Malignant melanoma with ulceration**. Breslow thickness at least 1.0mm.
>
> …
>
> [emphasis added in bold]

35 Dr Tan stated that in February 2012, he learnt that Dr Huang had recalled the original slide from 2009. Upon hearing this, Dr Tan requested another slide containing deeper levels of the specimen from the paraffin block. Then, on 13 February 2012, Dr Tan issued a supplementary report ("the 2012 supplementary report") stating as follows:

> …
>
> DIAGNOSIS
>
> SKIN LESION, BACK
>
> **Ulcerated atypical melanocytic lesion, suggestive of a melanoma**…

> [emphasis added in bold; underlining in original]

36 Dr Tan claimed that this 2012 diagnosis indicating "suggestive of a melanoma" was only apparent on hindsight and with the knowledge that Mr Traynor had had a recurrence.

37 On 22 March 2012, a third opinion was sought from Professor Lee Yoke Sun ("Prof Lee") and Associate Professor Tan Hong Bing ("A/Prof Tan"). They reviewed the original slide from 2009 in their report ("Prof Lee and A/Prof Tan's pathology report") and commented as follows:

> …
>
> DIAGNOSIS
>
> Skin lesion (back), shave biopsy:
>
> - **Atypical Spitz Tumour** (please see comments)
>
> Comments
>
> The features of the lesion are those of an atypical Spitz naevus/tumour. **In this case, the adult age-group of the patient, presence of ulceration, asymmetry, increased cellularity, blunted maturation and dermal mitoses, are considered high risk features for aggressive behaviour, for this atypical Spitz tumor category** … Complete excision of the lesion is recommended. … **Close clinical correlation is required**.
>
> …
>
> [emphasis added in bold; underlining in original]

38 The Appellant's expert pathologist, Dr Kirkham, was of the view that the specimen was "consistent with an invasive melanoma in vertical growth phase". In his view, the Respondents' 2009 diagnosis that "[t]here [was] **no malignancy**" [emphasis added] was ***incorrect***: "[N]o competent pathologist would have taken the view that the skin biopsy showed an unequivocally benign

lesion. At the very least suspicion of possible malignancy should have been raised and a further expert opinion sought".

39 Even Dr Tan's own 2012 supplementary report, after he had obtained deeper levels of the same specimen from 2009, had diagnosed an "[u]lcerated atypical melanocytic lesion, suggestive of a melanoma". It was Dr Kirkham's view that it was only this *later report* that correctly recognised the specimen was an ulcerated melanocytic lesion. Prof McCarthy similarly considered Dr Tan's 2012 supplementary report to be "so different [from the 2009 pathology report] that the reports are virtually incompatible". Prof McCarthy was of the view that the later report where Dr Tan indicated the specimen was in fact an atypical melanocytic lesion was an acknowledgment by Dr Tan that his original 2009 pathology report was both inadequate and inaccurate.

40 In contrast, the Respondents relied on the evidence of their expert pathologist, Dr Lee Siong See Joyce ("Dr Joyce Lee"), that Dr Tan had performed a proper examination of the specimen in 2009. She considered that his diagnosis of "no malignancy" was "an interpretation that Dr Tan made in his professional judgment based on the combination of histopathological features that he saw … favouring a benign melanocytic nevus".

41 Dr Joyce Lee acknowledged that the correct finding was one of malignant melanoma with ulceration. But she nevertheless claimed that a "good proportion of reasonable pathologists would fail to arrive at the correct findings of malignant melanoma" because of the specimen's intrinsic limitations as a shave biopsy. Dr Joyce Lee claimed that the shave biopsy which had been performed in September 2009 was a "sub-optimal" biopsy (as compared to a more complete wide excision). She claimed that "further interpretation was hindered by a "lack of full visualisation" of the specimen".

42 Dr Kirkham and Prof Joyce Lee issued a joint report ("the joint report") which stated that "[u]lceration was extensive with only a small amount of residual epidermis present at the edge of the extensive ulcer", "[s]ome of [the] cells appeared to be maturing towards the base of the lesion", "some mild atypia was present" and "increased cellularity" was observed.

The Judge's findings on the Breach Question

43 The Judge rejected the Respondents' explanation that the original slide in 2009 could have indicated a benign Spitz naevus. He was persuaded by Dr Kirkham's evidence that this should have raised alarm bells as Mr Traynor was "a 47-year old man. Spitz neavi are benign neavi seen in children" (see the Judgment at [6]). We pause here to note that Mr Traynor was in fact 45 years old when he was first diagnosed by the Respondents, but this does not affect the essential point that the Judge was making, and that such information pertaining to Mr Traynor's age was in fact available to the Respondents in the accompanying information to the specimen sent to them in 2009.

44 The Judge considered that, even accepting Dr Joyce Lee's evidence that the original slide in 2009 had insufficient features to indicate melanoma, it was clear that the slide did not present a normal, healthy cell. In this regard, Dr Tan himself had acknowledged in cross-examination that he *had noticed* ulceration and a lack of epidermis. The Judge was of the view that Dr Tan ought to have investigated further and that the Respondents had "deeper, clearer portions [of the specimen] with [them] at the time". Once a further check was done, the Respondents would have reached the accurate diagnosis that the specimen was suggestive of melanoma, and which Dr Tan did in fact reach in 2012 (see the Judgment at [6]).

45 The learned Judge stated that "no clever twisting and turning around" the tests in *Bolam v Friern Hospital Management Committee* [1957] 1 WLR 582 ("*Bolam*") and *Bolitho v City and Hackney Health Authority* [1998] 1 AC 232 ("*Bolitho*") was "of any use" (see the Judgment at [8]). He went on to hold (see the Judgment at [8]):

> The circumstances in this case are straightforward and obvious. One need only bite on the undisputed facts, and if he finds a taste of sourness then that would be it. If a name must be given to that judicial exercise, one can, perhaps, call it the balsamic test, but we should wean ourselves of the obsession to name everything that appears new, especially when it is just plain, old common sense … Dr Tan was negligent in law in sending a report indicating a clean bill of health when the circumstances required, at the very least, further examination on his part …

The Breach Question

The parties' case on the Breach Question on appeal

46 Before us, Ms Kuah Boon Teng SC ("Ms Kuah"), counsel for the Respondents, launched a root and branch attack on the Judge's findings in relation to the Breach Question.

47 First, Ms Kuah relied on Dr Joyce Lee's testimony that this was a "diagnostically challenging" case. Dr Joyce Lee suggested that the features on the 2009 original slide favouring a benign naevus compared to a malignant melanoma were balanced on a "see-saw" and that Dr Tan had simply accorded the same observable features a different diagnostic weight as the Appellant's experts. This led Dr Tan to a different (and incorrect), but nevertheless reasonable and professionally defensible, diagnosis.

48 Second, Ms Kuah claimed that this was a case with a reasonable variance in interpretation as the experts had arrived at different diagnoses. In

her oral submissions, Ms Kuah sought to draw a parallel between Dr Tan's erroneous diagnosis in 2009 with Prof Lee and A/Prof Tan's diagnosis of an "Atypical Spitz Tumour". Ms Kuah submitted that there were other experts who had not reached a firm finding of malignant melanoma. In the alternative, Ms Kuah submitted that the diagnosis of all the other experts, and even Dr Tan (when he corrected himself in 2012) had been made with the benefit of hindsight.

49 Third, Ms Kuah relied on Dr Joyce Lee's evidence that this was a superficial shave biopsy where the features could not be completely visualised. She submitted that Dr Tan only had the deeper clearer portions of the sample in 2012, and that none of the other experts had opined that Dr Tan should have obtained deeper cuts of the specimen in 2009 when he first viewed the sample.

50 Fourth, Ms Kuah submitted that the Judge had erred in law by eschewing the test in *Bolam* and *Bolitho* ("the *Bolam-Bolitho* test") in favour of his "newly minted "*balsamic test*"" [emphasis in original].

51 Mr Kronenburg, counsel for the Appellant, focused on the Respondents' 2009 pathology report, which had unequivocally stated there "[t]here [was] no malignancy". This was to be contrasted with several pathologists who had reviewed the original slide from 2009 and concluded that the specimen had malignant potential. Dr Fong's diagnosis was "Malignant melanoma with ulceration". Prof Lee and A/Prof Tan had also reached a diagnosis of "Atypical Spitz Tumour" and "high risk features for aggressive behaviour". Although Dr Kirkham did not fully agree with Prof Lee and A/Prof Tan's diagnosis, he stated that the "clinical implication [of their report was] the same as [Dr Fong's] report", which was that the original slide showed a "lesion with a significant potential to progress and metastasise to other sites in the body".

52 Mr Kronenburg submitted that the original slide was not sub-optimal and that all the other pathologists were able to reach relatively consistent conclusions on the features they had observed. In the alternative, Mr Kronenburg defended the Judge's findings that Dr Tan had access to the entire specimen and that the option to prepare a further slide with a deeper and clearer cut of the specimen was always available to the Respondents since 2009.

Our analysis on the Breach Question

53 We agree with the Judge that this was a straightforward case. The standard required of Dr Tan was that of a reasonable and competent pathologist. It required Dr Tan to have diagnosed Mr Traynor in a way that "at least some responsible body" of pathologists would have done. The *Bolitho* addendum is engaged where it is clear that there is a "*genuine* difference of opinion … within the medical community" as to what that medical practitioner ought to have done (see the decision of this court in *Hii Chii Kok v Ooi Peng Jin London Lucien and another* [2017] 2 SLR 492 ("*Hii Chii Kok*") at [109] [emphasis in original]).

54 In our view, the *Bolitho* addendum has not even been engaged to begin with. There does not appear to have been an actual material difference in opinion between *any* of the pathologists or experts. Regardless of whether there was a variance in opinion, ***none*** of the pathologists and experts (even Dr Tan in his 2012 supplementary report) was prepared to ***conclusively*** state that the original slide displayed a *benign* tumour. And yet this was exactly what Dr Tan had done in his 2009 pathology report by stating that "[t]here is no malignancy". Even if we accept Ms Kuah's claim that the diagnosis of benignity and malignancy was balanced on a "see-saw", this is very different from the firm and incorrect diagnosis that the Respondents had provided to Mr Traynor and the Appellant.

The original slide was at least suggestive of malignant melanoma

55 In our judgment, a reasonable and competent pathologist would *at least* have reached the conclusion that this was an atypical melanocytic lesion suggestive of melanoma, if not one that was straightforwardly a malignant melanoma. It will be recalled that this was in fact Dr Tan's own view in 2012. Upon viewing the deeper levels of the specimen in 2012, Dr Tan revised his diagnosis from stating there was "no malignancy" to diagnosing an "[u]lcerated atypical melanocytic lesion" that was "suggestive of a melanoma". We agree with the Judge that this latter diagnosis from 2012 should have been the diagnosis provided to the Appellant and Mr Traynor in 2009 (see the Judgment at [6]).

56 The Judge's finding is supported by the diagnoses of the other pathologists and experts who had examined the original slide from 2009. Examining this slide, Dr Kirkham diagnosed the specimen as an "invasive malignant melanoma with epithelioid and spindle cell histology". Dr Fong's diagnosis was similarly one of "[m]alignant melanoma with ulceration". Even though Prof Lee and A/Prof Tan did not diagnose malignant melanoma, they opined that this was an atypical Spitz naevus/tumour with "high risk features for aggressive behaviour" requiring "[c]lose clinical correlation".

57 We are not persuaded by Ms Kuah's contention that the later diagnoses of the original slide by Dr Kirkham, Dr Fong, Prof Lee, and A/Prof Tan were made because they had already known of the eventual diagnosis of malignant melanoma (*ie*, it was made with the benefit of hindsight). Nor are we persuaded that Dr Tan's own diagnosis in 2012 was due to his receiving additional information. The assertion that the later diagnoses were made with the benefit of hindsight of the eventual diagnosis was not put to Dr Kirkham in cross-

examination, nor to Dr Fong, Prof Lee and A/Prof Tan (who were not called to the stand). We note that the Respondents' own expert, Dr Joyce Lee, testified that looking at the original slide *without the benefit of hindsight* she would not have said that it was a benign specimen, and would have instead diagnosed it as an atypical melanocytic lesion.

58 Even putting to one side the differences in diagnoses, we are not fully persuaded that the correct diagnosis could have been an equivocal one. In fact, several of the *observable* features in the original slide were indicative of malignancy. In this regard, as a starting point, it is necessary to determine what could have been observed, which is a pure finding of fact and a *precursor* inquiry without recourse to the *Bolam* test (see the recent observations of this court in *Noor Azlin bte Abdul Rahman v Changi General Hospital Pte Ltd and others* [2019] 1 SLR 834 ("*Noor Azlin*") at [63]). Here, Dr Tan accepted that he had observed features such as ulceration and spindled naevus cells. In the joint report, Dr Kirkham and Dr Joyce Lee agreed that ulceration was clearly present and extensive, that spindled cells were present, and that there was "increased cellularity". Hence, crucial features of the slide were in fact *unequivocally observable*.

59 As for whether the Respondents' interpretation of the original slide was reasonable, this was an inquiry subject to the *Bolam* standard (see *Noor Azlin* at [64]). In this regard, both Dr Kirkham and Dr Joyce Lee agreed that "[n]aevoid cells of the kind to be expected to be seen in a benign banal melanocytic naevus were not present". Dr Joyce Lee accepted that the fact the specimen was in a vertical growth phase and ulcerated would increase the risk of it being "highly aggressive". She also accepted that if there was an extensively ulcerated lesion with increased cellularity one could not say the specimen was benign. In our view, all of these observable features and the subsequent interpretation of those

features all support Dr Kirkham's and Dr Fong's diagnoses that the 2009 slide showed an *unequivocally* malignant melanoma (see [56] above), or if equivocal, at the very least one suggestive of melanoma.

The original slide could not have shown "no malignancy"

60 In any event, the Respondents' attempt to cast this as an equivocal case is ultimately irrelevant. It must be recalled that Dr Tan's 2009 pathology report was not at all an equivocal diagnosis, but a firm one of "no malignancy". It was clear that whatever the original slide might have indicated, it *could not* have indicated a firm finding of no malignancy. Dr Joyce Lee accepted that, as a responsible and competent pathologist, she would have sent the sample to someone else to have another look. She further accepted that it would be completely wrong to rule out a malignancy.

61 We also find Ms Kuah's equation during her oral submissions of the Respondents' diagnosis of "[u]lcerated intradermal naevus" with that of Prof Lee and A/Prof Tan's diagnosis of "atypical Spitz naevus/tumour" to be unhelpful. If anything, Prof Lee and A/Prof Tan were quite clear in their report that even if the specimen indicated an *atypical* Spitz naevus, several of the features in the original slide such as ulceration, asymmetry, increased cellularity and blunted maturation, were all "***high risk features for aggressive behaviour***" [emphasis added]. In addition, Prof Lee and A/Prof Tan noted the "adult age-group" of Mr Traynor was another high risk factor. We note that Mr Traynor's age was information on the clinical request form that had accompanied the specimen that had been sent to the Respondents. It was clear to us that even if Dr Tan had not reached the same conclusion that the other pathologists had, ***at the very least***, the circumstances warranted further examination on his part (see

also the Judgment at [8]). These were steps which the Respondents had neglected to perform.

The Respondents had deeper and clearer cross-sections available in 2009

62 We find Ms Kuah's suggestion that the Respondents did not have deeper and clearer cross-sections available to them in 2009 to be patently unsustainable. When the specimen was sent to the Respondents, it was placed in a paraffin block from which the original slide was prepared (see [23] above). It was undeniable that the paraffin block containing the rest of the specimen had been with the Respondents throughout. There was simply no other way in which Dr Tan could have prepared his 2012 supplementary report, when he requested for deeper cross-sections *from the same specimen* ***from Quest***.

63 Ms Kuah then submitted that even if the Respondents had such deeper and clearer cross-sections with them in 2009, none of the pathologists and experts had opined that Dr Tan should have obtained deeper cuts of the paraffin block in 2009. We do not accept this submission. On the contrary, Dr Kirkham had testified that "[o]ne of the first things to do would be to cut some further sections … to get a clearer view". Dr Kirkham's recommendation for a deeper cross-section was supported by Prof Lee and A/Prof Tan's recommendation for a complete excision of the lesion. Hence, even if Dr Joyce Lee was correct that the view in the original slide was obstructed due to the "superficial nature of the shaved biopsy", she also accepted complete excision was probably mandatory. In this regard, we would note that it is irrelevant that the wide excision in 2012 showed no further traces of melanoma in the primary site. Rather, it seems to us that the experts' recommendation for a wide excision was in part to get a more accurate look at the specimen. This was in fact already possible without a wide

excision, as the Respondents already had deeper levels of the specimen with them at that time.

64 Most significantly, far from testifying that the Respondents did not have deeper cross-sections available then, it was *Dr Tan's own testimony* that in 2009 (before he wrote the pathology report) ***he had decided*** that deeper cross-sections were not required for examination because he had deemed the levels of the specimen to be sufficient for him to make a diagnosis. Hence, on the Respondents' own evidence, they clearly could have made a further check, but in the event, erroneously and unreasonably ***chose*** *not* to do so.

The Respondents' breach was straightforward and obvious

65 We would also observe that Dr Tan had candidly admitted in cross-examination that he had interpreted the original slide as showing a benign lesion. Dr Tan had in fact *intended* that his 2009 pathology report reflect precisely this diagnosis of a *benign* lesion. Leaving aside Dr Kirkham's, Dr Fong's, and Dr Tan's 2012 pathology reports which all alluded to melanoma, Dr Tan's 2009 pathology report with its firm diagnosis that "[t]here is no malignancy" was a very far cry from those pathology reports diagnosing *malignant* melanoma. Indeed, as Dr Kirkham observed in relation to Dr Tan's 2009 pathology report, there was "no suggestion of doubt, uncertainty, equivocation, or malignancy in that report". *Even Dr Joyce Lee, who was the Respondents' expert, accepted that no competent pathologist would have taken the view that the skin biopsy showed an unequivocally benign lesion*, and that in atypical cases the approach taken should be to give "a preferred diagnosis, acknowledging the degree of uncertainty". In the circumstances (and as we have already noted above at [54]), the *Bolitho* addendum is not even engaged since

the tenor of the Respondents' evidence does not even begin to contradict the Appellant's case.

66 Dr Kirkham testified that the effect of the Respondents' unequivocal diagnosis (in the 2009 pathology report) was to lead any general practitioner to "pat the patient on the back" and tell the patient that the biopsy showed benignity. ***Misled*** by the Respondents, Mr Traynor ***did not seek further medical treatment*** when, in fact, the mole on his back was ***a cancerous melanoma***.

67 It is difficult to understate the significance of the Respondents' breach. As Dr Joyce Lee accepted, lives depend upon accurate diagnoses by pathologists, and diagnoses had therefore to be undertaken with due diligence. This does not mean that pathologists are expected to get it right all the time, but, *at a minimum* (a point which Dr Joyce Lee also accepted), if a pathologist could not rule out the worst-case scenario, they should have stated so in their report. In the present case, Dr Tan not only failed to state that he could not rule out melanoma, he also delivered a report indicating ***the exact opposite*** – that there was no malignancy. Put simply, Dr Tan intended to convey, and did convey, that the lesion was benign.

68 We agree with the Judge that the Respondents' misdiagnosis was a straightforward breach. We accept that if Mr Traynor had been informed that the mole was not benign, this "would have resulted in a completely different course of action for both physician and patient" (see the Judgment at [8]). At the very least, it was Dr Joyce Lee and Dr Kirkham's evidence that they would have sought a second opinion. In her oral submissions, Ms Kuah conceded that if Mr Traynor had been told the mole was not benign, at the very least there would have been a follow-up. In our view, even a follow-up would almost

certainly have led to a diagnosis of "malignant melanoma" or one "suggestive of melanoma".

69 Ms Kuah argued that the Judge had "failed to apply the *Bolam-Bolitho* test" and instead "substituted his own brand of "*plain old common sense*" to disregard the expert evidence in favour of "his newly minted "*balsamic test*"" [emphasis in original]. We disagree. The Judge was clearly aware of the *Bolam* and *Bolitho* tests and had clear regard and recourse to them. Rather, it was the Judge's view that the Respondents were so obviously in breach that no twisting and turning of *Bolam* or *Bolitho* could prevent a finding against them (see the Judgment at [8]; see also [45] above). For the reasons set out above, we are similarly unimpressed with Ms Kuah's argument and are also of the view that the Respondents had clearly breached their respective duties of care.

The Causation Question

70 Having rejected the Respondents' case on the Breach Question, we turn to the Causation Question. An essential element of the tort of negligence is that of causation. It is not sufficient to show that there has been a breach; the Appellant must also show that there was a necessary link based on the "but for" test between the Respondents' wrongful conduct and the damage to Mr Traynor (see the decision of this court in *Sunny Metal & Engineering Pte Ltd v Ng Khim Ming Eric* [2007] 3 SLR(R) 782 ("*Sunny Metal*") at [64]; see also Winfield and Jolowicz, *Tort* (Edwin Peel and James Goudkamp gen ed) (Sweet & Maxwell, 19th Ed, 2014) ("*Winfield and Jolowicz on Tort*"), at para 7–024).

71 We must stress that in most cases of medical negligence – as in the present case – many of the questions of causation are not questions of statistical

evidence, but are, strictly speaking, simple determinations based on the "but for" test, to be answered on a balance of probabilities.

72 The following questions are in fact determinations to be resolved on the balance of probabilities and can be conceptualised chronologically and sequentially:

(a) Was the Respondents' negligence, in allowing the melanoma in Mr Traynor's lymph nodes to grow from 2009 to 2012, likely to have caused Mr Traynor's eventual death in 2013 (independent of any pre-existing condition)?

(b) If the answer in (a) is in the affirmative, was Mr Traynor's fate already conclusively biologically determined in September 2009 when the Respondents had misdiagnosed him?

(c) If the answer in (b) is in the negative, were there available treatments that would have prevented Mr Traynor from dying in the way that he did?

(d) If the answer in (c) is in the affirmative, would Mr Traynor have availed himself of these treatments?

(e) If the answer in (d) is in the affirmative, would Mr Traynor have been "cured" and would he have lived to his full life expectancy if he had availed himself of the said treatments?

Preliminary observations on the Causation Question

73 Before we resolve these factual difficulties, we elucidate several *conceptual* points which are of particular significance to the facts of this case.

The Bolam-Bolitho *test is not applicable in the causation context*

74 Ms Kuah submitted that the Judge should not have held the Respondents liable in causation. She argued that, in preferring Prof McCarthy's evidence over the Respondents' expert, A/Prof John Chia Whay Kuang's ("Prof Chia") evidence, the Judge had erred in "failing to apply the *Bolam-Bolitho* test when determining causation".

75 With respect, Ms Kuah appears to have gotten the legal position the other way around. There is in fact no basis in the law of medical negligence for the *Bolam-Bolitho* test to be applied to the concept of ***causation***; instead the test has historically been regarded as relevant only in assessing the question of ***breach*** (see *Winfield and Jolowicz on Tort*, at para 6-034). As this court had explained in *Hii Chii Kok* at [2], [54] and [76(b)], the *Bolam-Bolitho* test is concerned with whether "the general professional standard has been *met*" [emphasis added]. The *Bolam-Bolitho* test is therefore concerned with a potential diversity of views as to *the standard of care* when a person exercises a special skill (a quasi-***normative question***), and not with a diversity of views as to causation, which is about what had actually happened (a purely ***descriptive question***).

76 In *Hii Chii Kok* at [56], this court had elaborated that the *Bolam-Bolitho* test was an attempt to strike a balance between "the need to respect the diversity of views within a profession and the need to hold members of that profession responsible for their acts". This was because of the potential difficulties of attempting to identify a single professional consensus on the correct course that ought to have been taken, and if there was genuine controversy about those *professional standards* that the experts were unable to resolve, whether it would be fair to hold the practitioner liable for that deviation (at [55] and [56]).

77 Causation, on the other hand, is a matter of ***evidence*** and while there may be a role to be played by expert opinion, at this stage of the inquiry the court is not concerned with what the defendant practitioner ought to have done, but whether the defendant's action or omission was or was not a necessary condition for the plaintiff's loss under the "but-for" test (factual causation) and whether we should attribute responsibility for the consequences to that cause (see Peter Cane, *Atiyah's Accidents, Compensation and the Law* (Butterworths, 6th Ed,1999) ("*Atiyah on Compensation*") at pp 92 and 99).

78 It has been occasionally observed that the different stages of the inquiry do not necessarily matter in terms of duty of care, breach, or causation: see the English Court of Appeal's comments in *Vellino v Chief Constable of the Greater Manchester Police* [2001] 3 All ER 78 at [59] in the context of dismissing a claim based on the turpitude doctrine. It is also true that the limits of liability are ultimately a question of policy (see the observations of this court in *Thomson Medical* at [1]). However, we echo the views of the learned commentators in *Winfield and Jolowicz on Tort* (at para 5-005) that it remains useful that the test of negligence is organised into its constituent elements (*ie*, duty of care, breach, causation, and the appropriate remedy). These provide judges with sequential frames of analyses. We also note the comments by Kirby J in the High Court of Australia's decision in *Neindorf v Junkovic* (2005) 222 ALR 631 at [55], that the stages of analysis also help to *narrow* the respective inquires:

> 55 … Generally speaking, each of the constituent elements of the tort of negligence – duty, breach and damage – considered *seriatim*, progressively increases the specificity of the inquiry into how the incident occurred and the way in which damage was sustained. The broadest and most general level of analysis occurs at the duty stage. Here, the inquiry is primarily concerned with whether injury to the plaintiff or to a class of persons to whom the plaintiff belongs, was reasonably foreseeable. With respect to the breach element, the inquiry is

> directed, in part, to whether a reasonable person in the defendant's position would have foreseen the risk of injury to the plaintiff. Finally, the damage element is most specific. The issue here is whether the damage sustained as a result of the breach of duty was of a kind which was reasonably foreseeable. …

79 Most importantly, we are of the view that the elements are organised sequentially and separately as a matter of *principle*, because the different stages may have different policy considerations underpinning them. As to when the *Bolam-Bolitho* test should apply, it seems to us that the policy considerations underpinning breach and causation present subtle but important differences.

80 In *Hii Chii Kok* at [79], this court had observed that one powerful criticism of the *Bolam* test is that it is said to have reduced negligence to an exercise of doctors judging doctors. Negligent doctors would, when sued, look for sympathetic experts, and the combination of such evidence from partial experts and the possibility of judicial deference inherent in the *Bolam* test might confer near immunity on the medical profession. However, in *Hii Chii Kok*, this court had at [81] contemplated that a wholesale rejection of the *Bolam* test might be "unnecessarily radical" and held that the considerations inherent in the *Bolam* test remained valid in the context of diagnosis and treatment (at [100]).

81 The retention of the *Bolam-Bolitho* test is a matter of principle, because it would be unfair to impute liability on a medical practitioner for holding a medical opinion which others in his profession quite reasonably held (see *Hii Chii Kok* at [56]). This court also noted the practice of defensive medicine might be a concern that the courts should be mindful of, *only in so far* as it would have an impact on whether the proposed standard would fortify or hinder the medical profession's fulfilment of its duties to its patients (at [85]). In other words, the

Bolam-Bolitho test remained of relevance in the context of ***breach*** – which was a matter of professional standards.

82 Nevertheless, the foregoing considerations of what the practitioner ought to have done, and concerns over defensive medicine, are *fundamentally* irrelevant in the context of causation. What the general *professional* standard(s) are have nothing to do with whether or not the defendant has or has not caused damage to a particular patient. For example, consider a doctor, who had prescribed highly toxic chemotherapy to a patient, which ends up killing the patient in the effort to save him from his underlying cancer. That doctor could be said to have *caused* the patient's death. However, if there was wide consensus within the profession that this was the appropriate mode of treatment, and this was indeed a logical consensus, the toxic treatment would ***not*** constitute a *breach* of that doctor's duty of care, and he or she would be free of liability.

83 Similarly, the argument of defensive medicine has very little to do with the question of causation. Doctors, we believe, do not practise medicine with an eye to whether they might *cause* some potential loss to the patient. That is because causation (as we will discuss in a moment) is often a *retrospective* analysis. Arguments of ***causation*** often arise ***only after*** a practitioner has breached his or her duties of care, and when he or she seeks to escape liability. At this particular moment, the law of negligence asks whether, *despite* having breached professional standards, a practitioner should not be found liable because the damage was ultimately not caused by him or her, or would have otherwise occurred despite his or her breach.

84 Even more significantly, *defensive medicine, if at all practised, goes toward the issue of* ***breach*** *and not* ***causation*** because a breach is the *antecedent* stage in the analysis (and the precondition) for a practitioner to be liable for

negligence in the first place. If a practitioner has complied with professionally reasonable standards, it would not matter whether the treatment he or she has or has not prescribed led to the patient concerned suffering loss. The doctor has not breached her professional duties and would not be held liable. It is for these reasons that the spectre of defensive medicine, which is often raised when a defendant is held liable in medical negligence, is simply a ***red herring***. We cannot emphasise enough that as long as a practitioner takes reasonable care – a standard which the medical profession laudably adheres to – he or she has nothing to fear even if her actions may have ultimately caused a patient damage. By that same token, the considerations underpinning the *Bolam-Bolitho* test (which are to do with matters of professional standards and breach) ought not apply to the question of causation.

Causation in fact, in law, and as a matter of expert evidence

85 We turn to the "but for" test, which we have just considered at [70] above. The "but for" test is a means of establishing the inquiry of *causation in fact*, which is "the question of whether the relation between the defendant's breach of duty and the claimant's damage is one of cause and effect in accordance with scientific or objective notions of physical sequence" (see *Sunny Metal* at [52]). This aspect of the inquiry is about the *physical connection* between the defendant's actions and the damage suffered by the plaintiff.

86 The question of *factual* causation has long exercised philosophers. Many events in the natural world may be a factual "cause" of any particular effect as long as they are "precedent and contiguous" to each other (see David Hume, *A Treatise of Human Nature* (Lewis Amherst Selby-Bigge gen ed) (Oxford: Clarendon Press, 1896) at p 170). Hence, for practical purposes, the courts generally apply "but-for" causation to *narrow* down the possible causes of an

event to only the *necessary* conditions, or the *causa sine qua non* (see *Winfield and Jolowicz on Tort*, at para 7-007). We should emphasise that "but for" causation is not the *only* test in causation, as the common law contemplates at least six different causation tests (see Kumaralingam Amirthalingam, "Causation, Risk and Damage" (2010) 126 LQR 162 at p 164).

87 The "but for" test only serves as a first filter to *exclude* irrelevant causes. As H L A Hart and Tony Honoré have observed, there remains a potentially infinite number of necessary conditions fanning back in time (see *Causation in the Law* (Oxford University Press, 2nd Ed, 1985) at p 69; see also *Sunny Metal* at [53]). For instance, a necessary condition for a driver to have caused injury to a pedestrian would be the asphalt laid on the road some years back. But it would be absurd to hold the asphalt layer liable for the driver's negligence. To resolve these difficulties, the courts undertake inquiries into *causation* ***in law***, which is an attributive question as to whether the defendant should be made responsible for the consequences of his actions that have befallen the plaintiff. Put another way, ***legal*** *causation* consists of picking out one or more necessary conditions (*ie*, the *causa causans* as opposed to the *causa sine qua non*) which are in a sense "more important" than the mass of conditions that makes up the background of the causal picture (see *Atiyah on Compensation* at pp 98–99).

88 In the present case, in arriving at his findings on causation, the learned Judge "accept[ed] Prof McCarthy's assessment, but with some caution". This led the Judge to decline the Appellant's submission that he should find that Mr Traynor would have survived outright. Instead, the Judge estimated that but for the Respondents' negligence, Mr Traynor would have survived for only another four years (see the Judgment at [19]). The Judge's finding came under heavy attack from *both* Mr Kronenburg for the Appellant, *and* Ms Kuah for the Respondents. Counsel for both parties argued that the Judge should not have

substituted his view for those of the experts. Ms Kuah, in particular, forcefully submitted that the Judge "should defer to the opinion of either of the experts". In other words, the parties were urging us to adopt the *entirety* of the opinions of their respective experts as to the factual findings on causation.

89 Although we ultimately respectfully disagree with the Judge's findings of fact on causation, we are not persuaded by the parties' submissions that a judge must *inexorably* make a finding that accepts the *entirety* of an expert's opinion. Both parties cited the decision of the British Columbia Supreme Court in *McLean v Weir* [1977] BCJ No 935 ("*McLean*") at [28] (which was cited in part in the decision of this court in *Muhammad Jefrry v Public Prosecutor* [1996] 2 SLR(R) 738 ("*Muhammad Jefrry*") at [98]) that the court was bound to accept one or the other medical theory advanced. However, it is useful to set out more fully Gould J's observation in *McLean* at [28] as follows:

> 28 *…It is true that the court may accept [in] whole or in part or reject in whole or in part the evidence of any witness on the respective grounds of credibility or plausibility, or a combination of both. But in technical matters, unlike in lay matters within the traditional intellectual competence of the court, it cannot substitute its own medical opinion for that of qualified experts. The court has no status whatsoever to come to a medical conclusion contrary to unanimous medical evidence before it even if it wanted to, which is not the situation in this case.* If the medical evidence is equivocal, the court may elect which of the theories advanced it accepts. If only two medical theories are advanced, the court may elect between the two or reject them both; it cannot adopt a third theory of its own, no matter how plausible such might be to the court. …
>
> [emphasis added]

The emphasised portions of *McLean* were not cited in this court's observations in *Muhammed Jefrry*. When appreciated in the proper context, Gould J was ***not*** stating that a court *must* be forced to undertake a *binary* choice wherever medical evidence is proffered, and certainly not a binary choice as to the *entirety*

of an expert's evidence. Rather, he was suggesting that if there was no contrary evidential basis (particularly in the case of a *unanimous* medical opinion), a judge should not adopt an alternative theory unfounded on the evidence.

90 This much is also obvious when one considers this court's observations in *Saeng-Un Udom v Public Prosecutor* [2001] 2 SLR(R) 1 ("*Saeng-Un Udom*") at [26] (which was also cited to us by the parties):

> 26 The duties of a judge in dealing with expert opinion are succinctly stated in *Halsbury's Laws of Singapore* vol 10 (Butterworths, 2000) at para 120. 257:
>
> > As to reception of the evidence, the court may, if there is no definite expert evidence to the contrary, agree with the expert (*Official Administrator Federated Malay States v State of Selangor* [1939] MLJ 226) but it must not blindly accept the evidence merely because there is no definite opinion to the contrary (*Re Choo Eng Choon, decd* (1908) 12 SSLR 120). Apart, however, from that duty, the duty of the court is largely negative. Ex hypothesi, the evidence is outside the learning of the court. Therefore, the role of the court is restricted to electing or choosing between conflicting expert evidence or accepting or rejecting the proffered expert evidence, though none else is offered (*Muhammad Jefrry bin Safii v PP* [1997] 1 SLR 197). *The court should not, when confronted with expert evidence which is unopposed and appears not to be obviously lacking in defensibility, reject it nevertheless and prefer to draw its own inferences. While the court is not obliged to accept expert evidence by reason only that it is unchallenged (Sek Kim Wah v PP* [1987] SLR 107*),* ***if the court finds that the evidence is based on sound grounds and supported by the basic facts, it can do little else than to accept the evidence****.*
>
> [emphasis in italics in original; emphasis added in bold italics]

As this court had observed in *Saeng-Un Udom*, a court is not bound to accept an expert's opinion merely because it is uncontroverted. However, a court may find that it should accept uncontroverted expert evidence *if the opinion was grounded on a sound basis*. Hence, it appears to us that the question of whether

to accept or reject an expert's evidence is ultimately not a question of whether and how the evidence is controverted, but whether any eventual view arrived at is supportable in logic and evidence. The court's determination as to whether it should accept parts of an expert's evidence (and if so which parts) is guided by considerations of consistency, logic, and coherence (see *Sakthivel Punithavathi v Public Prosecutor* [2007] 2 SLR(R) 983 at [75]–[76]). This requires a scrutiny of the expert's methodology and the *objective facts* he had based his opinion upon (see the High Court decision of *Public Prosecutor v Choo Peng Kuen* [2018] SGHC 230 at [64]).

91 It has also not escaped our attention that several of the observations that parties cited to us about the court's purported binary selection of expert evidence were in the context of breach (see *McLean* at [3], and *Khoo James and another v Gunapathy d/o Muniandy and another appeal* [2002] 1 SLR(R) 1024 ("*Gunapathy*") at [3]). However, as we have made clear at [75]–[84] above, the same considerations that attenuate the court's view of expert evidence as to *professional standards* are not always applicable to questions of causation. Indeed, in *Gunapathy*, this court had observed at [70] as follows:

> 70 The second and final comment we would make relates to the right of the trial judge to make a finding of fact ***preliminary*** to the application of the *Bolam* test. It is a well-settled principle that a **question of fact, as opposed to a question of the standards of medical practice, does not fall within the province of the *Bolam* test**. **Questions of fact are therefore rightly capable of adjudication by the judge.** …
>
> [emphasis added]

Those observations were echoed recently by this court in *Noor Azlin* at [63]. If questions of fact *prior* to the application of the *Bolam-Bolitho* test remain within the province of the judge, then the judge would, *a fortiori*, retain the ultimate

discretion to determine questions of fact *subsequent* to breach (*ie*, in the area of causation).

92 Drawing the threads of the foregoing analysis together, a judge is not invariably bound to make findings of fact, but where he or she does so, it need not be an invariable election between competing expert opinions. Certainly, the judge is not bound to accept any opinion in its *entirety*. The ultimate consideration in deciding whether to reject or accept expert evidence, and whether to do so in part or in whole is driven by, among other things, considerations of consistency, logic, and coherence, and with a powerful focus on the objective evidence before the court.

Fact probability, belief probability, and statistical outcomes

93 Our third preliminary observation relates to a tendency in medical negligence cases (and indeed in the present case) to focus overwhelmingly on the statistical evidence presented. A careful appreciation of what statistical evidence *means* and how it should be *applied* is necessary, and we hope to provide some guidance in this regard.

(1) The distinction between fact probability and belief probability

94 In the trial below, the Respondents' expert on oncology, Prof Chia, and the Appellant's experts, Prof McCarthy and Prof Kirkham, adduced several large scale studies to assist their respective cases. Many of these studies involved cohorts of melanoma sufferers, and their survival outcomes. On appeal, Ms Kuah relied heavily on Prof Chia's evidence and the studies to suggest that since the course of Mr Traynor's melanoma would have portended a negative outcome anyway, the Respondents ought not to be held liable.

95 Without pre-empting our deliberations on the matter, we think it useful to consider the observations of Prof Steve Gold in his article, "Causation in Toxic Torts: Burdens of Proof, Standards of Persuasion, and Statistical Evidence" (1986) 96 Yale LJ 376 ("*Gold on Statistical Evidence*"), cited by the UK Supreme Court in *Sienkiewicz v Greif (UK) Ltd* [2011] UKSC 10 ("*Sienkiewicz*") at [217].

96 Prof Gold's work was subsequently elaborated on by Prof David W Barnes in "Too Many Probabilities: Statistical Evidence of Tort Causation" (2001) 64 Law and Contemporary Problems 192 ("*Barnes on Statistical Evidence*") and Prof Claire McIvor, "The 'Doubles the Risk' Test for Causation and Other Related Judicial Misconceptions about Epidemiology" in Ch 8 of Stephen GA Pitel, Jason W Nyers and Erika Chamberlain (gen eds), *Tort Law: Challenging Orthodoxy* (Hart Publishing, 2013) ("*McIvor on Causation*").

97 The learned commentators illustrate a helpful conceptual framework:

(a) "Fact probability" is a piece of probabilistic evidence that speaks to the existence (or non-existence) of a causal connection between the defendant's actions (or omissions) and the pleaded damage. For example, a statistical study showing that 64 per cent of employees contracted mesothelioma at a defendant's work site might speak in favour of the existence of "but for" connection between the plaintiff employee's mesothelioma and the defendant's negligence in exposing the plaintiff employee to asbestos.

(b) "Belief probability" is the degree of overall strength and credibility attributed *by the decision-maker* to the fact probability

evidence (*ie*, the statistical study). A court may look at, among other things, the credibility of the study, its authors, and the reliability of the study.

(c) "Sampling error probability" refers to indicators of scientific reliability such as p-values and confidence intervals. These measure the degree of variation in the results against the sample size. They indicate the likelihood that the results produced by the study is due to the unrepresentativeness of the sample rather than a biological association. A sampling error probability is just one factor that is relevant to determining a court's belief probability in a piece of statistical evidence.

98 Courts often collapse *the fact* to be proven (the burden) with the *amount* of credence which must be given to that fact in order to support a finding (the standard). The resulting shorthand "more likely than not" is a ***conflation***, because it is in truth directed to belief probability (*ie*, the standard of balance of probabilities) and not toward the fact probability (see *Gold on Statistical Evidence* at pp 385–386). This problem arises from describing the balance of probabilities as requiring above 50 per cent of proof (with anything above 50 per cent equated to 100 per cent proof and anything below equated to zero per cent) and then mapping the figure of 51 per cent (or more) *directly* on to the relevant piece of statistical evidence (see *McIvor on Causation* at pp 222–223).

99 It should be understood that ***statistical evidence is really just fact probability***: just because a statistical study shows a 64 per cent likelihood that the pleaded damage was caused by the defendant's conduct does *not automatically* mean that the test for causation is satisfied. The statistical value of 64 per cent holds no intrinsic legal significance, and depends entirely on the belief probability (*ie*, the level of confidence the courts holds in it) (see *McIvor*

on Causation at p 223). Hence, while a court ***could*** place its belief in the reliability and appropriateness of that piece of fact probability (the statistical evidence), it need not invariably do so. Statistical evidence is but one factor to be weighed in the overall mix (see *McIvor on Causation* at p 225).

(2) Statistical evidence and epidemiological studies

100 As we noted above, several of the studies alluded to by the parties were cohort studies. As Prof Gold has observed, such studies are concerned with populations rather than individuals. Hence, although proper scientific interpretation may mean that the correlations within the studies might lend weight to an inference of causation, they cannot in the individual case conclusively prove causation (see *Gold on Statistical Evidence* at p 380).

101 The matter can be illustrated with the case of *Gregg v Scott*, which we have cited at the outset of this Judgment at [3] above. In *Gregg v Scott*, the claimant, Mr Gregg, who suffered from non-Hodgkin's lymphoma, was unable to prove on the balance of probabilities that the defendant's misdiagnosis had prevented an outright *cure*. This is unsurprising, since as Prof Gold notes, in these situations the usual form of fact probability (direct observation of the patient) may provide little or no evidence of causation (see *Gold on Statistical Evidence* at p 379). Rather, Mr Gregg pointed to statistical evidence suggesting that 42 per cent of the patients with his symptoms (at that stage of cancer) at the time of the misdiagnosis (and when treatment should have been commenced) would survive to the 10-year interval. By the time he had been accurately diagnosed, the tumour under Mr Gregg's left arm had grown and invaded the neighbouring tissues in the left side of his chest. The statistical evidence showed that patients in Mr Gregg's position (at this progressed stage of cancer) would by then only have a survival rate of 25 per cent.

102 For present purposes, we focus on just one aspect of the majority's reasoning in *Gregg v Scott*. Both Lord Hoffmann (at [64]–[65]) and Baroness Hale of Richmond (at [204]–[205]) alluded to the trial judge's findings that the statistical evidence showed that Mr Gregg's initial condition was, on the balance of probabilities, not susceptible to treatment, or would have produced a relapse. This led Lord Hoffmann (at [71]) to affirm that "it was likely that [Mr Gregg's] life would have been shortened to less than ten years anyway". Lady Hale similarly concluded (at [205]) that even if Mr Gregg were treated in time, the relapses would have happened anyway.

103 As can be seen, the focus of the House of Lords in *Gregg v Scott* was on determining what was the relevant damage. It is trite that damage is the gist of negligence (see Jane Stapleton, "The Gist of Negligence" (1988) 104 LQR 213, at p 214). To locate that damage, a court ***compares*** the ***initial state*** of the plaintiff with his ***post-breach*** *state*. It appears to us that it is this exercise of comparison that led the House of Lords in *Gregg v Scott* to differing answers – although, as we shall see in a moment, the majority did *not*, in *substance*, distinguish between the initial state of the plaintiff and his post-breach state.

104 The majority accepted it was not possible to tell for certain what the patient's initial state was at the time of misdiagnosis. However, it decided that the ***statistics should be applied*** to find that *he would have died* ***in any event***. This came across most strongly in Lord Hoffmann's judgment (at [71] and [80]), but was also alluded to by Lady Hale (at [198] and [203]). Since the patient's initial state was ***assumed*** to be the *same* as the post-breach state (as, in *both* cases, he would have died), the majority reasoned that the patient *had not actually lost anything* (Lord Phillips of Worth Matravers MR took a slightly different tack, declining to allow Mr Gregg's appeal on the basis that the adverse

outcome had not materialised since the patient had not actually died yet (at [189])).

105 The majority accepted that there had been a breach causing a delay in treatment and that there was a physical injury in the form of the growth of Mr Gregg's tumour. However, the tumour *might have grown anyway* due to a pre-existing condition (Lord Hoffmann at [80]), or even with remission the cancer *might have relapsed* in any event (Lady Hale at [205]). As the majority saw it, if the cancerous outcome would *still* occur because of *some other reason* despite timely treatment, then it could not be said that, but for the defendant's breach, Mr Gregg would have survived. There was in effect ***no damage***. It is this aspect of the majority's reasoning that leads to all patients whose characteristics appear to correspond to survival outcomes that are below 50 per cent to be left without any compensation, whereas those with characteristics corresponding to survival rates above 50 per cent are given a full award.

106 We do ***not*** think it is correct for the statistics to have been applied by the majority (at [104]–[105] above) in the way that they did. There are two reasons why this is so. First, the fallacy lies in the ***comparison***. To decide (using the balance of probabilities test) what Mr Gregg's initial state was, the majority ***reasoned backwards***, looking at how many persons with similar characteristics perished 10 years from that initial state. Since more of them died (58 per cent) than survived (42 per cent), the majority decided it was likely Mr Gregg was initially doomed anyway. But this misses the point. Mr Gregg ***never*** got to the 10-year mark and hence could not have been the appropriate subject of such an approach. This is because the defendant's breach interrupted the usual course of events. With great respect, the error by the majority in *Gregg v Scott* lies in ***transposing*** the ***endpoints*** of *other* patients to Mr Gregg's ***initial state***. The

outcomes of the other patients' cancers at the 10-year mark depend on the patients *never having experienced a negligent delay in treatment*. But that is, without more, not determinative of the course of *Mr Gregg's* cancer. By definition, Mr Gregg's post-breach state cannot be the same as those of the other patients at the 10-year mark. At best, the statistical outcome was a proxy for ***what might have been***; it did not reflect what ***actually happened***, as the breach precluded timely treatment from ever occurring. The fallacy in the reasoning can also be viewed in light of how this piece of statistical evidence is to be construed *as a piece of fact probability* (see [99] above). Given that the large scale study *cannot* be determinative of what had actually happened (the fact probability), a court must consider whether, and to what extent they can rely on this information (the belief probability) to make findings on causation.

107 Second, and in any event, we do not think it is correct for the statistical proxy to be applied in the manner in which the majority in *Gregg v Scott* did. With great respect, the majority appears to have conflated the ***tools of analysis*** (the statistics and the balance of probabilities test) with the ***object of analysis*** (the damage). Mr Gregg had in his initial state the *same characteristics* as the 58 per cent who did *not* survive, but as Lord Hoffmann observed (at [64]), Mr Gregg also had a ***similar condition*** as the 42 per cent who *did* survive. The mere fact of these percentages tells us nothing about which group Mr Gregg would have (as a matter of relapse), or had already (as a matter of pre-existing latent condition) fallen into. It is true that if events were allowed to run their course, 42 per cent of patients with Mr Gregg's initial state would survive, whereas 58 per cent would not. However, as we have already pointed out (at [106] above), the events were ***prevented*** from running their course. Moreover, the course of ***Mr Gregg's cancer*** **specific** to him was an event ***independent*** of the statistical outcomes. As we respectfully see it, the error in the majority's

reasoning was its use of this piece of fact probability (the 42 per cent figure) to substitute for the *standard* in question, which was really *the degree* to which the court was *convinced* on the balance of probabilities.

108 The upshot of the foregoing analysis is that judges must be cognisant that statistical evidence is but *one piece* of the factual probability puzzle. The ultimate inquiry lies in the overall assessment of the plaintiff and defendant's respective cases. Of course, as Lord Dyson JSC notes in *Sienkiewicz* at [222], although in certain situations the statistical evidence may be so compelling that the court may be able to infer belief probability from fact probability, it must nevertheless be mindful of the distinction between the two. Similarly, we do not rule out situations where the relevant statistical evidence might be used as a proxy for other tasks such as quantification of remedies. However, it cannot be overemphasised that ***all depends on the circumstances***, and the court cannot abdicate its fact-finding function by mere dint of the statistical evidence.

109 With these preliminary observations, we now turn to consider the facts.

The parties' primary cases on whether Mr Traynor's fate was "biologically determined"

Lymphatic spread and haematological spread

110 The Appellant's case is that the misdiagnosis in September 2009 ultimately led to Mr Traynor's death from metastatic melanoma. In essence, her case is that the Respondents' misdiagnosis delayed accurate diagnosis until 2012, allowing the melanoma to grow in Mr Traynor's lymph nodes undetected. It was this unchecked growth that led to the melanoma metastasising (*ie*, spreading) from the lymph nodes and into Mr Traynor's distant organs and, ultimately, his death.

111 Testifying on behalf of the Appellant, Prof McCarthy considered that in September 2009, Mr Traynor's melanoma was essentially nodal. The Appellant's case is that the melanoma had first metastasised in the lymph nodes and then spread into the blood stream, in a process known as "haematological spread". According to Prof McCarthy, from the blood stream, some of the tumour would then grow elsewhere in the body (*ie*, distal metastasis).

112 On the other hand, the Respondents relied on the evidence of their expert on oncology, Prof Chia, that Mr Traynor's fate was already "biologically determined" when he had been misdiagnosed in September 2009. Prof Chia was of the view that Mr Traynor was suffering from an aggressive form of malignant melanoma. By 2009, the melanoma from the primary tumour had already spread through his blood stream into his distant organs, and/or through the lymphatic system and Mr Traynor's blood stream into the distant organs.

Causation Question (a): Was the Respondents' negligence likely to kill Mr Traynor independent of any pre-existing condition?

113 It appears to us that the Respondents do not seriously contest that the unchecked growth of the lymph nodes after 2009 could have led to the melanoma growing and escaping into the bloodstream, ultimately killing Mr Traynor. Rather, the Respondents relied on Prof Chia's evidence that by September 2009, lymphatic *and* haematological spread had already occurred *simultaneously*. The Respondents' case is therefore that since haematological spread had already occurred in 2009, *even if* they had breached their duties of care, Mr Traynor's fate had already been sealed.

114 Although this was not seriously contested, we are satisfied on a balance of probabilities that independent of any pre-existing haematological spread before 2009, *after September 2009*, the growth of the melanoma in the lymph

nodes would have been a source of fatal melanoma. In this regard, it is apposite to note that when Mr Traynor's lymph nodes were removed in 2012, there were ***five*** infected lymph nodes.

115 In this regard, Prof McCarthy testified that the two years of delay from September 2009 to January 2011 allowed Mr Traynor to develop a "massive tumour of 5[cm]… four tumours, a large massive tumour in the axillae, so all that time he was developing melanoma in his lymph nodes, right in contact with blood vessels, and the lymph nodes in fact drain eventually into the blood vessels". We note that by April 2012, two of his lymph nodes were "completely replaced" by tumour while "the remaining three show[ed] focal melanoma cells". Prof McCarthy also testified that out of the hundreds of sentinel lymph node biopsies he had seen, he had never seen a patient with five infected sentinel nodes.

116 The large amount of melanoma in Mr Traynor's lymph nodes in 2012 suggests to us that the unbridled growth of the melanoma in the lymph nodes from 2009 to 2012 would likely have caused haematological spread during this period, seeding fatal melanoma in Mr Traynor's distant organs and causing his eventual death in 2013. Hence, on the balance of probabilities the Appellant had proven a straightforward causative link between the Respondents' negligence (and the ensuing delay) and Mr Traynor's death.

117 *However*, this is only the *beginning* of the inquiry. It must be recalled that the Respondents' case is that there was another, *simultaneous*, cause of fatal melanoma originating from the primary tumour *before* 2009 that would *also* cause Mr Traynor to die. In other words, even if the Appellant could show a straightforward causative link she had not yet shown that "but for" the

Respondents' negligence Mr Traynor would not have perished, and it is to this question that we turn.

Causation Question (b): Was Mr Traynor's fate already biologically determined by the time of the Respondents' negligence in September 2009?

Dormancy

118 To meet the Respondents' argument, a key feature of the Appellant's case is that in September 2009, haematological spread had *not yet occurred* and that the malignant melanoma was only confined to the lymph nodes under Mr Traynor's armpits. In this regard, the Judge agreed with the Appellant, finding that the cancer was "growing and developing but only in the lymph nodes under the armpits" (see the Judgment at [19]).

119 The Appellant disputed the Respondents' claim that haematological spread had already occurred by September 2009. She relied on Prof McCarthy's evidence that for years (*ie*, even up until April 2012), when Mr Traynor had his lymph nodes removed, the CT and PET scans did not show any evidence of metastatic disease (see [27] above). It was only in August 2013 that the CT and PET scans definitively began to show metastasis in Mr Traynor's distant organs.

120 In response, Prof Chia, on behalf of the Respondents, explained that when haematological spread through the body occurs, melanoma cells are able to take root as tiny clusters of tumours in the other organs. In the event that melanoma cells do take root in the distant organs, it is possible for these melanoma cells to be in a state of immune equilibrium where they do not grow as yet, but where they are also not eliminated by the immune system or by adjuvant chemotherapy. This state is known as "dormancy". However, when the

patient's immune system is temporarily impaired, or when the melanoma cells undergo further mutation, the tumour cells will then escape from the immune system and start to grow. Distal metastasis will then become detectable.

121 Prof Chia suggested that melanoma had already taken root in Mr Traynor's distant organs in September 2009, but was not detectable until 2013 (after he was re-diagnosed) because Mr Traynor's melanoma had been in a period of dormancy even prior to September 2009. In this regard, Prof McCarthy accepted that microscopic metastasis of a dormant nature might not be caught on a CT or PET scan. It is the Respondents' case that Mr Traynor suffered from exactly such dormant tumours even before September 2009. In other words, *the Respondents' case is that there was another* ***hidden*** *cause of Mr Traynor's death that* ***existed even before*** *their negligence*. Causation was not established because, even if Mr Traynor had availed himself of timely treatment, chemotherapy would not have been capable of eliminating the melanoma that had already been lodged in his distant organs.

The parties' respective cases on haematological spread and dormancy

122 It is helpful for us to set out the key aspects of the parties' cases. The Appellant's primary case is that *before* September 2009, Mr Traynor's melanoma was confined to his lymph nodes. She argued that the fatal melanoma had originated from the enlarged lymph nodes under Mr Traynor's armpits ***after*** September 2009 and relied on the following to refute the Respondents' assertion of pre-2009 haematological spread and dormancy:

(a) Prof Chia's "theory of [tumour] dormancy was not supported by the facts" and the Judge had rightly found that "though it is possible for [Mr Traynor's] cancer to be dormant, the evidence suggests more likely that it was not" (see the Judgment at [19]);

(b) Prof McCarthy's evidence was that Mr Traynor's immune system was unlikely to be keeping haematologically-spread melanoma dormant. This was because the melanoma in his lymph nodes continued to develop apace "as though the immune system was doing nothing during that period";

(c) Prof McCarthy testified that Mr Traynor's primary tumour was thin. Given that the less melanoma there was, the less likely distal metastasis was to occur from the primary tumour, this reduced the likelihood of the Respondents' case; and

(d) Prof McCarthy accepted the tumour dormancy could occur, but pointed out that the likelihood of a tumour remaining dormant for a period of longer than three years was "very, very rare".

123 Conversely, the Respondents claim that ***before*** September 2009, Mr Traynor's melanoma had already undergone haematological spread from the primary tumour (*ie*, the mole on Mr Traynor's back) or lymph nodes and had lain dormant. They rely on the following pieces of evidence to support the contention that pre-2009 haematological spread and dormancy was likely:

(a) Prof McCarthy accepted that microscopic dormant tumours were not detectable by PET or CT scans. In this regard, it was pointed out that Mr Traynor's initial PET scans did not detect distal metastasis. However, Mr Traynor did eventually perish from distal metastasis, which shows that tumour dormancy was present in this case;

(b) Mr Traynor's primary tumour was ulcerated. The Respondents argue that the presence of ulceration shows a significantly higher risk of distant metastasis;

(c) Prof Chia refuted Prof McCarthy's assertion that the immune system had to act to cause tumours to be dormant in some areas and not others. Prof Chia suggested that there could be a difference in the rates of growth of tumours in different areas of the body, as tumours could grow heterogeneously due to different molecular characteristics; and

(d) Prof Chia also relied on several epidemiological and statistical studies to suggest that tumour dormancy could occur over a long period of time.

Our survey of the evidence on haematological spread and dormancy

(1) The existence of dormancy and haematological spread

124 We first address the Appellant's reliance on the Judge's finding at Judgment at [19] that dormancy had not occurred. Because an essential feature of the Respondents' case is that the haematologically-spread tumours were dormant throughout, if dormancy could be disproved, this would in turn conclusively disprove the Respondents' defence.

125 We do not take the Judge's finding to mean that Mr Traynor's cancer had *never* entered into a period of dormancy. However, it seems to us that *at best* all the Respondents could establish was a *mere possibility* of dormancy. We say so for several reasons.

126 First, what the Respondents have in their favour is that in January 2012, the CT and PET scans did not show evidence of metastatic disease in Mr Traynor's distal organs. Hints of metastatic disease only showed up in April 2013 and was confirmed in August 2013 (see [26] and [31] above). However, this period of *non-detection* did not necessarily mean that there was dormancy.

127 According to Prof Chia, dormancy means that melanoma cells in the distant organs are suppressed by the immune system, are unable to be eliminated, but are also unable to grow or be detected clinically. As we see it, the fact that the distal metastasis was not *detected* from January 2012 to August 2013 did not mean that dormancy was present (*ie*, the immune system was suppressing the melanoma). Other possibilities were present, including the possibility that the melanoma had set in *after* September 2009 but before April 2012 and was growing at a rate that was not yet clinically discernible.

128 Second, Prof McCarthy claimed that dormancy prior to September 2009 could not have happened as this required Mr Traynor's immune system to *not* suppress the lymphatic spread of melanoma, whilst *simultaneously* suppressing the haematological spread during this period. Conversely, Prof Chia claimed that there was no evidence that the immune system had to work in the same way across the entire body. Prof Chia stated that, instead, immune systems worked locally, and could suppress the melanoma in some organs but not in others.

129 In this regard, we note there is no objective evidence to support either of the experts' assertions. But all this means is that the Appellant cannot conclusively disprove the fact of dormancy, it does not go so far as to suggest that dormancy had in fact occurred (which the Respondents must necessarily show in order to prove that haematological spread had occurred prior to their negligence in September 2009).

130 Third, even if dormancy was present between January 2012 to August 2013, this fact alone does not mean that the Respondents have shown (even on the balance of probabilities) that haematological spread had occurred *before* 2009 and had stayed dormant since. The relevant question remains whether the

seeding of the malignant melanoma and dormancy occurred prior to September 2009 (the Respondents' case) ***or*** only prior to April 2012 (the Appellant's case).

131 It is important to note that the nature of dormancy, which the Respondents' case depends upon, would portend a *lack of detection* of melanoma spread to the distant organs on the CT and PET scans. An ***absence of clinical signs*** on the PET scan in 2012 might mean dormancy was occurring all the way back in 2009, but it could also mean it had only started in 2011. It could even mean (as we pointed out at [127] above) that there was no dormancy, but that the melanoma had spread *just* before the scan in January 2012 and was not yet clinically detectable. All of this tells us that dormancy in 2009 is logically possible, but does *not* tell us what the degree of likelihood is in so far as *the starting-date* of the dormancy is concerned (*ie*, whether the dormancy started before 2009 ***or*** whether it started after 2009 instead) – which, as we have already noted, is ***the crucial issue*** in the context of the present case. In other words, even if we accept that dormancy and haematological seeding had occurred at some point, this *cannot*, without more, *specifically* show that melanoma had infected Mr Traynor's organs before the Respondents' negligence in 2009.

(2) The characteristics of Mr Traynor's primary tumour

132 It will be recalled that Mr Traynor's primary tumour (*ie*, the mole on his back) was only about 1.0mm thick, but was ulcerated. Prof McCarthy's evidence was that the thinness of the primary tumour portended a lower likelihood of distal metastasis, though he accepted that the fact of ulceration would also make it "a little more likely to have spread".

133 Focusing on the fact of ulceration, Prof Chia alluded to a study, Kelly M McMasters *et al*, "Ulceration as a Predictive Marker for Response to Adjuvant Interferon Therapy in Melanoma" (2010) 252 Annals of Surgery 3 ("the Sunbelt study"). Prof Chia extracted several graphed curves from the study, purporting to show a marked decrease in non-relapse and survival rates for patients with ulcerated tumours. Ms Kuah also emphasised the findings of the Sunbelt study in her oral submissions. The Respondents also relied on another study, Charles M Balch *et al*, "Long-Term Results of a Multi-Institutional Randomized Trial Comparing Prognostic Factors and Surgical Results for Intermediate Thickness Melanomas (1.0 to 4.0mm)" (2000) 7(2) Annals of Surgical Oncology 87 ("the Balch study"). Prof Chia relied on the Balch study in stating that "ulceration was the key determining factor" for lack of survivability from melanoma. The Respondents suggest that since Mr Traynor's primary tumour was ulcerated, he faced a poor prognosis from the outset (prior to September 2009).

134 We find the Respondents' and Prof Chia's use of the Sunbelt and Balch studies to be not probative in this regard. First, while it is undisputed by Prof McCarthy that the ulceration of a primary tumour does portend a decrease in survival rates for melanoma sufferers *overall*, neither the Sunbelt study nor the Balch study shows that ulceration markedly increases the chance of direct distal metastasis occurring from the primary tumour *and staying dormant* (the Respondents' case) as compared to metastasis from the lymph nodes (the Appellant's case). The absence of this characteristic of dormancy means that the studies are not helpful to either party's case.

135 Second, in so far as ulceration would increase the likelihood of distal metastasis prior to September 2009, this has to be weighed against the fact that Mr Traynor's primary tumour was fairly thin and the amount of melanoma in

his lymph nodes in September 2009 must have been less than when they were removed in April 2012 (as Mr Traynor's right armpit was only palpable in December 2011).

136 Third, Prof Chia's reference to the Balch study was only to state that nodal biopsy (a type of treatment) might not be beneficial to patients who had ulcerated tumours, while his reference to the Sunbelt study was to show that ulceration "portends to a much worse prognosis" due to high rates of recurrence after treatment. While Prof Chia's evidence might potentially be illuminating as to *treatment outcomes depending on the ulcerated nature of the melanoma*, it tells us very little about whether haematological spread is more or less likely to result from an ulcerated primary tumour and to stay dormant throughout.

(3) The duration of dormancy

137 On the Respondents' case, the fatal melanoma would have had to haematologically spread prior to September 2009 and remained dormant until April 2013 (when there were some signs of relapse) or August 2013 (when distal metastasis was definitive on the results of a PET scan) (see [30]–[31] above). This would imply that the melanoma had remained dormant in Mr Traynor's distant organs for *longer than* ***43 months***.

138 In contrast, on the Appellant's case, the fatal melanoma had haematologically spread after September 2009. Mr Traynor's first PET scan, which took place in January 2012, showed no detectable distal metastasis. Hence, even if dormancy was present, dormancy on her case would only have to last from before January 2012 to April 2013 (***15 months*** to as long as 43 months), which was the period that the distal metastasis was undetectable on the CT and PET scans. This would necessarily be a *shorter* period of time than

the over 43 months of dormancy the Respondents' case entails (since haematological spread on the Respondents' case would have had to have happened *before* September 2009).

139 To support the longer period of dormancy their case entails, the Respondents relied on Prof Chia's reference to a paper, Mark B Faries *et al*, "Late Recurrence in Melanoma: Clinical Implications of Lost Dormancy" (2013) 217 Journal of the American College of Surgeons 27 ("the late recurrence paper"). In a presentation slide, Prof Chia cited statistics from the late recurrence paper showing that 6.9 per cent of patients after 10 years of non-relapse would have a recurrence of melanoma. Prof Chia further pointed out that if the group of patients who had relapsed *prior* to the 10 year interval (*eg*, relapse at the six-year interval) were to be taken into account, the percentage of patients experiencing a relapse would further increase.

140 Moreover, Prof Chia alluded to a study on organ transplants from sufferers who had undergone surgery to remove the detectable melanoma. However, despite being purportedly melanoma-free, their donated organs resulted in donees contracting melanoma (see Rona M Mackie *et al*, "Fatal Melanoma Transferred in a Donated Kidney 16 Years after Melanoma Surgery" (2003) 348 The New England Journal of Medicine 6 ("the kidney transplant study")). Prof Chia pointed out that the kidney transplant study itself showed dormancy for as long as 16 years. The study referred to 13 other reports where organs were transplanted six months to eight years after melanoma surgery where melanoma developed in 21 out of 26 cases. Prof Chia averred that these suggested that dormancy of long periods was clearly a possibility.

141 We would pause here to note that even taking into account Prof Chia's evidence that a substantial portion of melanoma sufferers would relapse after

six years or longer after initial diagnosis, there was no information about whether these "late recurrences" in the study were relapses at the primary site, in the lymph nodes, or in the patients' distant organs. In other words, it is not at all clear if these late recurrences occurred in the same way that the Respondents are attempting to suggest had happened to Mr Traynor, which is that microscopic tumours had haematologically spread to a patient's distant organs and had remained dormant. As for the kidney transplant study, we note that the organs referred to in the 13 other reports were transplanted between "*six months* to eight years" [emphasis added] after the melanoma surgery. Hence, it was not clear from these cases whether the typical period of dormancy was short or long. In any event, the small sample size (21 cases) also does not tell us how likely it was that such dormancy would feature in melanoma sufferers overall.

142 The upshot of the late recurrence paper and the kidney transplant study is that they showed that a long period of dormancy is a possibility. But this does not ultimately prove the Respondents' case, which is that a longer period of dormancy (more than 43 months) is *more likely* than a shorter period of dormancy (between 15 months to 43 months).

Our analysis as to whether haematological spread had occurred prior to September 2009 or after September 2009

143 The foregoing survey shows that the Respondents could only *allude to a possibility* that haematological spread had occurred before their misdiagnosis in 2009 and stayed hidden throughout. Conversely, in our judgment, the Appellant was able to show on the balance of probabilities that haematological spread had only occurred ***after*** September 2009 for three reasons.

144 First, Prof McCarthy's evidence was that "the probability that a tumour will … not [be] able to be discerned for a period of longer than three years …

is very, very rare." Although Prof Chia attempted to refute the rarity of long periods of dormancy, all the Respondents could really show is that it is *possible* for haematological spread to occur, and that it is *possible* for dormancy to have set in. However, none of the scientific literature adduced by the Respondents specifically supports Prof Chia's views as to the likelihood of dormancy occurring, or lasting, as the case may be, for such a long period of time.

145 Second, and relatedly, it is true that Prof McCarthy had not adduced scientific literature to support his assertions. However, his evidence was situated in the context of his *vast* experience of the melanoma sufferers he had treated. In this regard, while we have no doubt that Prof Chia is eminent and competent in his field, we note that he has had comparatively less experience in treating melanoma, attending to perhaps only 20 to 30 cases in his career. In contrast, Prof McCarthy had treated 9,000 melanoma sufferers, and was a founding member of the Sydney Melanoma Unit (currently named the Melanoma Institute Australia). The Unit had treated 23,000 patients with melanoma and was a major contributor to worldwide studies on melanoma management. In the circumstances, we found Prof McCarthy's experience to count towards his testimony about the relative rarity of long dormant melanomas.

146 Third, we are also persuaded that as a matter of common sense, the comparatively longer time (*more than* 43 months as compared to *less than* 43 months) the fatal melanoma would have had to seed in Mr Traynor's distant organs and then remain dormant throughout means that the Respondents' case is, on the balance of probabilities, less likely than the Appellant's case. In the final analysis, we agree with Prof McCarthy's opinion that the scenario presented by the Respondents was simply a less feasible one as it portended a *longer* period of dormancy (and especially in a situation in which the existence of dormancy had not been established on the facts).

147 We therefore reject the Respondents' defence that melanoma had migrated from Mr Traynor's primary tumour or lymph nodes to his distant organs *before* they had misdiagnosed Mr Traynor in 2009.

Causation Question (c): Whether the treatment would have been effective

148 We agree with the Judge's finding that since there was no haematological seeding, only Mr Traynor's lymph nodes had become involved with melanoma as of September 2009. The Respondents' negligence had caused a delay in treatment, thus allowing the lymph nodes to fester and grow with fatal melanoma.

149 Dr Kirkham's evidence was that the first lymph node to become infected is known as the "sentinel lymph node", so called because it guards the entrance to the lymph nodal basin. Both Prof McCarthy and Dr Kirkham testified that as the melanoma cells grew in the sentinel lymph node, it would grow bigger and begin to release melanoma cells into the tissue fluid channels around it. Hence, nodal metastasis was a sequential process, moving from the infected sentinel lymph node to the non-sentinel lymph nodes.

150 We are satisfied that the *specific* fatal melanoma that eventually spread into Mr Traynor's blood stream would more likely than not have been in, or originated from, the sentinel lymph nodes, which were the first to become infected with melanoma. This would have been the state of Mr Traynor's cancer as at September 2009.

151 The Respondents suggested that none of the treatments available at the time would have had any therapeutic effect. This was targeted at the Judge's finding that "[a]t the very least, there was a loss of an early opportunity for treatment" and that the Respondents' breach had caused Mr Traynor to "lose a

fighting chance" (see the Judgment at [8] and [19]). The Judge did not specify the nature of the treatment, but the Respondents claim that there was no evidence that Mr Traynor would have been offered chemotherapy.

152 The Appellant accepted that her case on treatment was not about chemotherapy or immunotherapy. Rather, her case is that Mr Traynor would have availed himself of surgical procedures. The first was sentinel lymph node biopsy ("SLNB"), which Prof McCarthy stated would have "revealed the microscopic melanoma metastasis in the lymph node[s]". Thereafter, completion lymph node dissection ("completion dissection") would have been undertaken, which would have removed all the remaining lymph nodes.

153 Prof Chia agreed that in Mr Traynor's case, SLNB would have entailed injecting radioactive tracer chemicals into or around the bilateral auxiliary lymph node basin. This would also allow the sentinel lymph node to be found, and then removed and examined. Prof Chia agreed that in 2009, the usual procedure if the sentinel node was found positive for melanoma would have been to undertake completion dissection, whereby the entire lymph node basin would have been cleared. This would include the removal of even the non-infected regional lymph nodes.

154 However, Prof Chia disagreed with Prof McCarthy that clearing the lymph nodes would have provided a therapeutic benefit. Ms Kuah relied on Prof Chia's evidence that:

> The consensus so far is that sentinel lymph node [biopsy] gives information on staging and prognosis which is important. *There's no therapeutic benefit, it doesn't reduce melanoma-specific deaths*. If you don't dissect the lymph node and you do what we call nodal observation, there is a higher risk of recurrence in the lymph nodes, without increasing the risk of distant metastasis. [emphasis added]

155 Prof Chia's view that SLNB had no therapeutic effect was based upon the clinical data from the Multicentre Selective Lymphadenectomy Trial studies, namely D L Morton *et al*, "Final Trial Report of Sentinel-Node Biopsy versus Nodal Observation in Melanoma" (2014) 370 The New England Journal of Medicine 599 ("the MSLT I study") and M B Faries *et al*, "Completion Dissection or Observation for Sentinel-Node Metastasis in Melanoma" (2017) 376 The New England Journal of Medicine 23 ("the MSLT II study") (collectively, "the MSLT studies").

156 According to Prof Chia, the MSLT studies showed that there was no difference in ultimate survival rates for patients who underwent a process of immediate completion dissection of the lymph nodes (*ie*, an immediate removal of all the lymph nodes once the sentinel nodes were discovered to be infected) ("immediate completion dissection") and those who were simply placed under observation and who only availed themselves of completion dissection when melanoma recurred in the remaining regional lymph nodes ("delayed completion dissection"). Relying on the MSLT studies, the Respondents claimed that "whether Mr Traynor had immediate lymph node dissection (in 2009) or delayed lymph node dissection (in 2012) following SLNB, there would have been no difference to the eventual outcome".

157 The Respondents also relied on Prof Chia's evidence that the MSLT studies have "convinced perhaps the most diehard surgeons … to actually put down the knife" and a purported conversation between him and the Chief of Surgical Oncology of the Singapore National Cancer Centre, who told Prof Chia that "[s]ometimes if we have a sentinel lymph node, we don't go in to clear … usually we discuss … if it recurs, you can clear it at the time of recurrence; it does not impact survival". Ms Kuah submitted that this showed

that even with SLNB followed by nodal dissection, it was unlikely that the course of Mr Traynor's disease would have been significantly altered.

158 We find this aspect of the Respondents' case to constitute another red herring for the following reasons.

SLNB would have led to the removal of the infected sentinel lymph nodes

159 First, much of the confusion arises because of three different types of surgical procedures involved: SLNB, immediate completion dissection, and delayed completion dissection. If Mr Traynor had been accurately diagnosed, his treatment plan would have been to undergo SLNB and then immediate completion dissection. If ***SLNB*** had been chosen, Mr Traynor's ***metastasised sentinel-nodes would have been removed***. As Prof McCarthy stated, "the sentinel nodes in most patients contain all the melanoma that is in the lymph node field … getting rid of the sentinel nodes is the important part of the therapy". Prof Chia's own evidence was that SLNB involved the ***removal*** and examination of the sentinel lymph node. This is confirmed by the MSLT II study, which states, "in most patients, nodal disease is limited to the sentinel lymph node or nodes and is ***removed by means of biopsy***" [emphasis added]. The MSLT II study makes clear that immediate completion dissection, on the other hand, is the "removal of the ***remaining*** regional lymph nodes ***after sentinel-node excision***" [emphasis added].

160 Specific to Mr Traynor's case, therefore, SLNB would not only have been important for prognostic and staging purposes, but would also have had a therapeutic effect. Since in September 2009, the melanoma was in fact confined to Mr Traynor's sentinel nodes (as there was no haematological spread by then), the SLNB procedure would have led to the removal of the infected sentinel

nodes containing the melanoma that did eventually spread into Mr Traynor's bloodstream and which did eventually kill him through distal metastasis.

The MSLT II study is not relevant to the effectiveness of SLNB

161 Second, the MSLT II study does not appear to be focused on the effectiveness of SLNB. On the contrary, the MSLT II study involved patients who had ***already*** undergone SLNB, and hence had their infected sentinel nodes ***removed***. Patients who tested positive for melanoma were then sorted into two cohorts. In one, they underwent immediate completion dissection, which removed the regional lymph nodes. In the other, patients were placed under close observation, and would only undergo delayed completion dissection when they suffered a recurrence of melanoma. The significance of the MSLT II study was that carrying out immediate completion dissection was not more effective than delaying completion dissection. In ***both cases***, this was ***after SLNB had already been performed***. In other words, the MSLT II study was simply concerned with a comparison of the effectiveness of immediate completion dissection and delayed completion dissection *inter se*. This was an entirely different kettle of fish from whether ***SLNB*** would have been effective in itself. Indeed, under cross-examination, Prof Chia *conceded* that the MSLT II study did *not* show that SLNB was not therapeutic. This was therefore, with respect, a misleading use of the MSLT II study.

162 We agree with Mr Kronenburg that the Respondents have confused ***immediate*** completion dissection with SLNB. Prof Chia's evidence about the remarks by the Chief of Surgical Oncology should be seen in the context of whether the ***remaining*** regional lymph nodes should be removed ***after SLNB had already been performed***. Again, this suggested that SLNB *would* be performed and that the removal of the infected sentinel lymph nodes would be

effective. This comported with Dr Kirkham's evidence that SLNB was intended to obviate the need for the removal of the non-infected regional lymph nodes, minimising the need for more extensive surgery. Nothing in the clinical studies adduced showed that SLNB was ineffective because it would not lead to the removal of the infected sentinel lymph nodes.

163 Accordingly, we affirm the Judge's finding that the Respondents' breach had caused Mr Traynor the loss of an opportunity for treatment. To clarify, it is our view that this loss of opportunity for treatment took the form of SLNB, which entailed the removal of the infected sentinel lymph nodes.

The Respondents' use of clinical data was not appropriate to the present case

164 Before we conclude our analysis on this point, we make an observation on the use of statistical data. At the trial below, the experts had produced reports and presentation slides for the court's consideration and to assist with the court's understanding of the medical and scientific evidence. These reports and slides cited various academic literature in support of the opinions offered by the respective experts. While the use of presentation tools such as reports and slides can facilitate understanding of often complex material, we think it is a matter of good practice for the parties and experts to also adduce the supporting literature. In cases such as these, an expert's opinion is not merely one delivered on the basis of the expert's personal experience, but is often derived from academic literature. It is therefore helpful for the source material to be *made available* and *carefully cited in context* so that the parties and the court can test the accuracy, veracity, methodological rigour, logic, and explanatory force of the expert's opinion.

165 As a case in point, Prof Chia had adduced a graph from the MSLT I paper purporting to show that the upfront removal of lymph nodes would have no effect on the risk of distal metastasis. The Respondents did not adduce the MSLT I paper at the trial below. Prof Chia's slide also did not include the accompanying caption to the graph from the Supplementary Appendix to the MSLT I, which shows that the comparison only applied to patients with ***thick*** (>3.5mm) ***primary melanomas***. Prof Chia would have been aware from his own report that Mr Traynor's primary tumour was about *1.0mm* thick and that this graph was therefore an inappropriate comparator.

166 When it was pointed out to Prof Chia in cross-examination that his use of the MSLT I graph was not applicable to Mr Traynor, Prof Chia disagreed. With respect, we cannot see the basis for his disagreement. In any event, we do not think the use of graphs without their necessary surrounding contextual information (such as their captions) was helpful.

Causation Question (d): Whether Mr Traynor would have availed himself of SLNB

167 It is also the Respondents' case that, even if SLNB would have been an effective treatment, Mr Traynor would have chosen not to avail himself of SLNB in September 2009.

168 The Respondents' submission in this regard is superficially attractive. It relies on the Appellant's own diagram adduced at the trial below, showing that if Mr Traynor had been correctly diagnosed in September 2009, he might instead have availed himself of close observation instead of SLNB. Prof McCarthy also stated that in Australia it was possible that Mr Traynor would not have undergone the SLNB procedure and would have just had a close follow-up. It was suggested that early discovery of Mr Traynor's melanoma

would not have made a difference, since he would only have opted to observe the lymph nodes, rather than carrying out SLNB or completion dissection of the lymph nodes.

169 On balance, we are not persuaded that Mr Traynor would not have availed himself of SLNB or completion dissection. First, it must be recalled that in April 2012, Mr Traynor had chosen to undergo bilateral axillary clearance of all the regional lymph nodes, which was more extensive than the SLNB procedure. Of course, the circumstances were more dire by then, and a biopsy in January 2012 had confirmed that the lymph nodes were infected with melanoma. Nevertheless, we think this is somewhat probative of the fact that Mr Traynor would have been cautious enough to have opted for SLNB.

170 Second, Prof Chia's own report stated that if Mr Traynor had been accurately diagnosed in September 2009, he would have had SLNB *and* completion dissection. Prof Chia also stated in his testimony that if the SLNB procedure found the lymph nodes to be positive for melanoma, the procedure *in about 2008* would have been to clear the lymph node basin. Prof McCarthy's amended report also indicated that while Mr Traynor would definitively have been placed in a "careful follow-up program", he would "probably" have availed himself of SLNB. Hence, it seems to us that the experts were agreed that SLNB would have been the likely treatment course for Mr Traynor.

171 Third, even if Mr Traynor had only availed himself of close observation, it seems to us that the metastasised nodes would still have been detected and SLNB *subsequently performed*. The experts were agreed that close observation entailed, among other things, an ultrasound examination at regular intervals. Prof Chia had adduced the work, *Clinical Practice Guidelines for the Management of Melanoma in Australia and New Zealand* (New Zealand

Guidelines Group, 2008), which stated that an ultrasound examination was capable of accurately detecting "lymph node metastases > 4-5***mm*** in size" [emphasis added]. When Mr Traynor had his PET scan in January 2012, these showed a nodal mass in the right axilla of up to 5 x 3.5***cm*** and the left axilla of 5 x 3.3***cm***. Mr Traynor's CT scan in January 2012 showed masses of similar sizes. It will also be recalled that when completion dissection was undertaken in April 2012, the largest of the infected right lymph nodes measured 6 x 4.5 x 3.5***cm***, while the infected left lymph node measured 5 x 3.5 x 2***cm***. We note that while the infected lymph nodes would not have grown to such large sizes in September 2009, an ultrasound was capable of detecting lymph node metastases of a magnitude of a size smaller. This lends support to Prof McCarthy's report that even if SLNB had not been undertaken in September 2009, an ultrasound examination "would have detected the axillary metastatic disease at an earlier time thus improving the prognosis for [Mr Traynor]". Prof Chia generally agreed that if a malignancy was detected, completion dissection would have been undertaken.

172 In the circumstances, we reject the Respondents' submission on this particular issue. If Mr Traynor had been accurately diagnosed, he would have availed himself of SLNB, which would have removed the infected lymph nodes containing the melanoma that eventually likely killed him. Also, at the very least, close observation would have detected the melanoma in those lymph nodes before it had the opportunity to spread in the way that it did, and they would then have been removed by either SLNB and/or completion dissection.

Causation Question (e): Whether Mr Traynor would have been "cured"

173 However, this is not the end of the inquiry with regard to the Causation Question. It will be recalled that the Appellant's case is that the Respondents'

breach had prevented Mr Traynor from living out his full life expectancy until the age of 82. It is on that basis that she claims damages.

174 Implicit in the Appellant's claim are multiple formulations of causation, including:

(a) That the Respondents' breach had caused Mr Traynor to die in the way that he had in December 2013;

(b) That but for the Respondents' breach, Mr Traynor would not have died in December 2013 at the age of 49; and

(c) That but for the Respondents' breach, Mr Traynor would have gone on to live until the age of 82.

Although the Appellant had proven causation with regard to (a), this did not necessarily entail proving causation with regard to (b) and (c). While the two enquiries seemed very similar, they were not in fact mirror images of each other.

175 In the context of the present case, the Appellant had shown that the Respondents' breach had caused Mr Traynor to die ***in the way he did*** – by allowing the infected lymph nodes to grow during the delay in diagnosis. Malignant melanoma from the swollen lymph nodes haematologically spread and seeded in Mr Traynor's distant organs, eventually leading to his death in December 2013. The Appellant also showed that if Mr Traynor had availed himself of treatment in a timely manner in September 2009, the infected lymph nodes would have been removed and ***this mode of death (ie, lymphatic spread leading to haematological spread) would have been avoided***.

176 However, the Appellant also had to show that ***all the other outcomes of Mr Traynor's melanoma would have been avoided***. In other words, *if* Mr Traynor had availed himself of the SLNB procedure in 2009, he would not have suffered a relapse thereafter and would have lived to his full life expectancy.

177 In order to exclude these other possibilities, the Appellant has to show that Mr Traynor would have been "cured" of the melanoma once timely treatment was administered, or at the very least that a relapse of melanoma was unlikely to have occurred. Indeed, this is the main basis of her appeal before us.

178 The Judge was keenly aware of this aspect of the Causation Question. In a particularly illuminating passage in the Judgment at [13], he observed as follows:

> … We sometimes avoid considering the impact of the possibility of possibilities by creating a refuge that we confidently name 'probability', but that is a vulnerable hideout because probability, by definition, admits other possibilities. Nevertheless, it is the court's duty to evaluate competing possibilities and decide which is the most probable on the evidence before it.

179 While the Judge generally accepted the Appellant's case, he also held that what Mr Traynor had lost was "a fighting chance" and that the Respondents' breach "probably caused him to die years earlier than he would have done". Although he considered the Appellant's claim that if Mr Traynor did not have cancer, he might have gone on to live until his 80s, the Judge declined to award damages based on a purported 68 per cent chance of surviving 10 years, instead awarding the Appellant damages based on four years of Mr Traynor's life expectancy (see the Judgment at [19]).

The parties' cases on whether there was a "cure" for Mr Traynor's melanoma

180 Mr Kronenburg submitted that, if Mr Traynor had been correctly diagnosed, he would have returned to a normal life expectancy of 82 years despite his melanoma. According to the Appellant's accounting expert, Mr Abuthahir Abdul Gafoor ("Mr Abu"), the life expectancy tables provided by Statistics Canada showed that a Canadian male aged 49 in 2013 would be expected to live until 81.7 years of age.

181 Prof McCarthy's report opined that if Mr Traynor had availed himself of SLNB and then completion dissection in 2009, this would have "eliminated the possibility that … subsequent systemic recurrence [would originate] from the axillary node field". If Mr Traynor had had the right diagnosis, it was "highly likely it would have been curative" and that if he did not have systemic dissemination of melanoma, he would have lived until his early 80s, regardless of the melanoma. Mr Kronenburg suggested that the evidence showed all the melanoma in Mr Traynor's body would have been eliminated, "thus curing him and returning him to normal life expectancy".

182 In contrast, the Respondents asserted that the Appellant has failed to show there was a complete cure removing *all* of the melanoma. First, the Respondents submitted there is no evidence provided by the experts as to what constitutes a "cure" in the context of metastatic melanoma or specific to Mr Traynor's case. They pointed to the fact that Prof McCarthy's report indicated that SLNB would only have "increase[d] the chance of survival for nodal metastasis by 20%". In his testimony, Prof McCarthy did not say that "survival" was equated to a cure, but instead claimed that "survival" meant that "the actual risk could be taken out to 20 years". Prof McCarthy went on to

explain that if a 10-year survival rate was used, "the risk or the death rate goes down to around 20 per cent".

183 Second, the Respondents submitted that even if it were to be accepted that haematological spread had not occurred prior to 2009, the Judge was correct in rejecting Prof McCarthy's assessment of Mr Traynor's life expectancy (see the Judgment at [19]). Prof Chia's evidence was that even if haematological spread had not occurred prior to 2009, Mr Traynor would not have had a good prognosis. In this regard, the Respondents relied on:

(a) The Sunbelt study, which Prof Chia relied on to state that close to 60% of patients with Mr Traynor's characteristics (an ulcerated primary tumour and sentinel lymph nodes that tested positive for melanoma) would experience a recurrence of melanoma within five years of diagnosis. Prof Chia had extracted a graphed curve from the Sunbelt study, which he claimed showed that Mr Traynor was similar to the group of patients of which more than 50% had suffered a relapse within five years of diagnosis; and

(b) A study, A M M Eggermont *et al*, "Prolonged Survival in Stage III Melanoma with Ipilimumab Adjuvant Therapy" (2016) 375 The New England Journal of Medicine 19 ("the Ipilimumab study") was also referred to. According to the supplementary statistics to the Ipilimumab study that Prof Chia had extracted, the "risk of recurrence or death" rate at the five-year mark would have been 30.3%. Proceeding on the basis that Mr Traynor had two involved lymph nodes and an ulcerated primary tumour, Prof Chia suggested that the statistics showed a 71% "risk of death" at the five-year interval.

184 Prof Chia also relied on the MSLT II and Balch studies, which showed high rates of relapses. In all these studies, Prof Chia pointed out that the patients identified were optimally managed, which would mean they had their infected sentinel lymph nodes removed by way of surgical procedures. On this basis, Prof Chia suggested that Mr Traynor's chances of survival were still poor regardless of whether his melanoma was optimally managed *and* regardless of haematological spread having not occurred prior to September 2009.

Our analysis on whether the Appellant had shown that Mr Traynor would have been cured

185 In our view, the Appellant has shown that Mr Traynor would be completely cured of his melanoma if he had elected for SLNB. Despite the impressive array of scientific and statistical studies that were cited to us, it is important to bear in mind our preliminary observations at [108] above of the need for careful scrutiny of the *relevance* and *appropriateness* of the evidence to the fact in question.

186 We turn first to Prof Chia's reliance on the Sunbelt study. We are not persuaded that the Sunbelt study is appropriate to Mr Traynor's situation, particularly since the lead author stated in the discussion to the paper that she would, "outside of the clinical trial … caution … reading too much into the results, as it is a small subgroup analysis … and we would consider these hypothesis-generating not hypothesis-testing or definitive data".

187 As for the Ipilimumab study, it tracked *recurrence-free survival*, which is the "risk of recurrence ***or*** death". As Prof Chia conceded, this was not only death from melanoma but *recurrence* ***and*** death. Moreover, such risk of recurrence included "local or regional recurrence" (*eg*, where the melanoma only recurs at the primary site or the lymph nodes) and not simply distal

metastasis, the latter which portended a higher degree of fatality. Hence, while the Ipilimumab study might show that there was a high possibility that a patient with Stage IIIB melanoma might suffer a relapse of their cancer within five years, the Respondents (and Prof Chia) could not draw the conclusion that this was equivalent to a *risk of distal metastasis* or a *risk of death* outright.

188 While we appreciate that the studies cited by Prof Chia suggest that even after SLNB, performing completion dissection and adjuvant therapy might not be effective, it was in cases where SLNB had not removed *all of the melanoma*, whereas we are prepared to find otherwise in Mr Traynor's case. Hence, while reliance on large scale studies may be appropriate in certain cases (as a *piece* of evidence that goes towards a judge's ultimate deliberation), each case must turn on its set of facts. In the present case, it transpires that it is possible to make findings ***specific*** to Mr Traynor's individual situation quite apart from the general outcomes in the large scale studies.

189 We turn to Prof McCarthy's evidence. Prof McCarthy stated that melanoma cells would float through Mr Traynor's tissue fluid into the lymphatic system and through the lymphatic system into the lymph nodes in the draining field. Melanoma cells would then usually go into the sentinel lymph nodes, and it was only when the sentinel nodes grew larger with tumour that they would release melanoma into the tissue fluid channels around them and into the non-sentinel nodes. If untreated, the whole of the nodal field would contain malignant melanoma cells. However, it appears to us if they were taken out early the infected lymph nodes would not have had the chance to multiply.

190 It seems to us that in September 2009, *all* of the melanoma would have been confined to Mr Traynor's lymph nodes, including the fatal melanoma that eventually spread into his bloodstream. Hence, SLNB would have not only

removed the possibility of the haematological spread that *did* kill Mr Traynor, (see [172] above) it would also had removed all possibilities of melanoma remaining and/or recurring in Mr Traynor's lymphatic system.

191 We are of the respectful view that the Judge had erred in finding that Mr Traynor had only lost a "fighting chance" and rejecting the Appellant's case that he would have been cured. Given our finding that SLNB would have removed all the melanoma in Mr Traynor's case, this should be taken to be equivalent to a cure. We therefore allow the Appellant's appeal on the Causation Question, reversing the Judge's finding that Mr Traynor had only lost four years of his life expectancy. Instead, we hold that damages should be calculated on the basis of Mr Traynor's *full* life expectancy.

Summary of our findings on the Causation Question

192 In light of the foregoing, we reverse the Judge's findings in so far as he considered that Mr Traynor would not have survived for 10 years. Indeed, it is our finding that the only cause of Mr Traynor's death was the melanoma that had haematologically spread from his infected lymph nodes after 2009. Hence, but for the Respondents' negligence, Mr Traynor would have been cured of his melanoma through the use of the SLNB procedure. Mr Traynor would have elected to undergo this procedure, and the procedure would have removed *all* of the trace melanoma. The Appellant has succeeded in her primary argument on the Causation Question on the balance of probabilities on the facts. In the circumstances, we do not need to consider the Appellant's alternative arguments or whether the Judge was correct to have had recourse to the minority's reasoning in *Gregg v Scott* pertaining to the loss of a chance doctrine, or to have utilised a "lost years" approach (see the Judgment at [16]–[19]).

193 We are grateful to the learned *amicus curiae*, Prof Gary Chan Kok Yew ("Prof Chan"), who provided detailed and extensive submissions on the Appellant's secondary case, which relied on the "loss of a chance" doctrine. Ultimately, it transpires that the issue does not arise for our determination, but we nevertheless record our gratitude for the admirable analytical rigour and wide-ranging arguments that he put forth for our consideration.

The Damages Question

194 Having assessed that the relevant loss was the loss of Mr Traynor's remaining life expectancy, and reversed the Judge's finding in this regard, we now turn to the appropriate quantum of damages underpinning the award.

195 As to the Damages Question, the Appellant had claimed under the following four categories:

(a) A Dependency Claim for the benefits the Appellant, and their two daughters would have received from Mr Traynor, amounting to $3,274,738.93. These included annual expenses, educational expenses, and household maintenance. It also included non-pecuniary benefits, such as mathematics coaching and driving lessons for their daughters;

(b) A Loss of Inheritance Claim for the sums the Appellant would have received as Mr Traynor had willed the entirety of his property to her. Assuming Mr Traynor would have incurred annual expenses of $243,000, there would have been savings to pass to his wife. These included a pre-trial inheritance component of $894,657 and a post-trial inheritance component of $4,112,790;

(c) A Loss of Appreciation Claim for the decline in the Traynor's family home, purchased on 16 September 2011, and which the Appellant claims would have appreciated $1,500,000 in value; and

(d) An Estate Claim for medical expenses, funeral expenses, out of pocket expenses, fees for filing of grant of probate, bereavement and pain and suffering amounting to $681,399.53.

196 As a result of the reversal of the Judge's finding as to whether Mr Traynor would have been cured, it has become necessary to remit certain issues for the Judge's further consideration. However, before we proceed to consider the Damages Question proper, we must express our view that it would be in the interests of all parties to explore the possibility of arriving at a settlement in relation to this particular issue – both from the perspectives of effecting closure as well as the saving of costs.

Preliminary issues as to the Damages Question

Mr Traynor's full life expectancy

197 We deal first with the preliminary issue of what Mr Traynor's full life expectancy would have been. As we indicated at [180] above, Mr Abu, the Appellant's expert accountant, had given evidence that Mr Traynor would have lived until the age of 82. Because the learned Judge found that Mr Traynor would have only lived for four more years, he rejected the Appellant's claim (see the Judgment at [19]). We have reversed the Judge's finding in this regard inasmuch as the award should be calculated to Mr Traynor's full life expectancy. However, we note that the Judge did not reject Mr Abu's evidence (or avert to the Respondents' submissions in this regard), although we also note that, given his decision, there was no need for him to ultimately make a finding

on what Mr Traynor's full life expectancy would have been. In the circumstances, we remit this matter of Mr Traynor's life expectancy to the Judge for his determination – bearing in mind, however, the fact that the Respondents did not appear to controvert Mr Abu's evidence in the court below.

The multiplier-multiplicand

198 We next turn to three issues that are relevant to both the Dependency and the Loss of Inheritance Claims. The first was the issue concerning how the discount for the multiplier-multiplicand(s) should be calculated.

199 Again, as the Judge was of the view that Mr Traynor would only have lived for four more years, which would have brought the parties to exactly the year of the trial, he did not find a need to apply a multiplier-multiplicand (see the Judgment at [22]). It follows from our holding that the determination of the appropriate multiplier-multiplicand(s) will have to be determined by the Judge, and we accordingly remit this matter for his determination as well.

Mr Traynor's annual income

200 The second was the issue of Mr Traynor's annual income. Mr Abu set out the following information concerning Mr Traynor's income:

Annual Employment Income	2008	2009	2010	2011	2012	2013
Salary	No breakdown available.			$270,999	$264,283	$256,341
Bonus				**$212,866**	$27,277	$25,403
Allowances				-	$59,696	$69,676

Total	**$198,725**	**$249,541**	**$258,176**	**$483,865**	**$343,256**	**$351,420**
Increase/ Decrease	-	25.6%	3.5%	87.4%	-29.1%	2.4%
Employer's CPF contribution	No breakdown available.			$12,297	$13,600	$13,600

201 The parties' experts were agreed that 2011 was an exceptional year. The company, Algorithmics International Incorporated ("Algorithmics"), where Mr Traynor was a senior employee up until 2012, was sold to International Business Machines ("IBM") in 2012. In particular, Mr Abu admitted there was no information from Algorithmics about the nature of the large bonus of $212,866 awarded in 2011. Accordingly, he reduced this figure down to a five-month bonus bringing Mr Traynor's annual income down to $450,000.

202 The Respondents relied on the evidence of their accounting expert, Mr Iain Potter ("Mr Potter"), that there was sound information that this bonus was exceptional because it was related to IBM's acquisition of Algorithmics. The implication was that this was a one-off event, and should not be taken into account. The Respondents submitted that the 2013 figure of $308,386 post-tax income (with a 1.1 month's bonus) should be used instead. In contrast, the Appellant suggested that using the 2011 numbers (adjusted to $450,000) was a more reliable indicator of Mr Traynor's income given that his 2012 and 2013 bonuses would have been depressed by his illness.

203 The Judge considered that because Mr Traynor's income was based on his work, which would have been severely affected by the malignant melanoma, the figures from 2012 and 2013 would not have been reliable. He accepted the

Appellant's submission that Mr Traynor's income should be based on his income of $450,000 in 2011 (see the Judgment at [35]).

204 With respect, we think the Judge might have erred in this regard. First, since it was the Appellant who was submitting that the amount of $450,000 was the figure that should be used, it was incumbent upon her to prove that figure. While we agree with the Judge that Mr Traynor's medical condition in 2012 and 2013 would have affected his work performance, it was nevertheless incumbent on the Appellant to adduce evidence showing *how* and to what *extent* this would have affected Mr Traynor's bonus. She could have done so by asking Algorithmics, or even IBM, as to what their pay policies would have entailed and what Mr Traynor would otherwise have earned. Instead, Mr Kronenburg conceded at trial that they had not sought that information from IBM.

205 Second, we note that the Appellant's own accounting expert, Mr Abu, had stated there was no information forthcoming from Algorithmics on the nature of the large bonus of $212,866 that Mr Traynor received in 2011. Even taking the adjusted figure of $450,000 as his income for 2012, this bonus would amount to 47 per cent of his total annual income for 2012. This figure of $450,000 was also clearly a large increase from Mr Traynor's total income of $258,176 in 2010, when his condition of malignant melanoma had not yet begun to affect his work performance. Hence, even if we were prepared to accept that Mr Traynor's work performance would subsequently have become affected by the malignant melanoma, we are not prepared to use the income of $450,000 as a starting point for what his income would otherwise have been.

206 Third, and inter-relatedly, Mr Traynor would likely also have been receiving bonuses in 2009 and 2010 while working for Algorithmics. There was no evidence that after joining IBM, he would have received a similar bonus as

the large one he received in 2011 (or even as much as the five months' bonus as suggested by Mr Abu). In fact, when measured against the trend of Mr Traynor's pre-tax income from 2008 ($198,725) to 2010 ($258,176), the 2013 pre-tax income of $351,420 was much more in line with the Judge's other finding regarding an annual salary increment of 5 per cent (see the Judgment at [36]). In the circumstances, we are of the view that the 2013 post-tax income of $308,386 was the appropriate figure, and we accordingly reverse the Judge's findings in that regard.

Annual increment of Mr Traynor's salary

207 The Respondents also submitted that the Judge had erred in holding that Mr Traynor's annual salary increment would have been 5 per cent. Ms Kuah submitted that an increment should not be expected as of right as "the Judge had himself pointed out "*there is no evidence that Mr Traynor's salary increment would have outweighed inflation*"" [emphasis in original].

208 With respect, Ms Kuah has plainly mis-cited the Judge's findings (see the Judgment at [36]), which we reproduce as follows:

> The plaintiff claimed that Peter Traynor's annual salary increment would be 5%. This was derived using his previous annual increments, which ranged from 3.5% to 87.4%. **The defendants did not factor any salary increases as they were of the opinion that there was no evidence that Peter Traynor's salary increment would have outweighed inflation.** I find that the evidence of Peter Traynor's previous annual increments leads to the reasonable conclusion that his annual salary increment would be about 5%. [emphasis added]

209 It was obvious that far from the Judge finding that Mr Traynor's annual increment would not have outweighed inflation, he was simply stating the *Respondents'* submissions in the court below and ***rejecting*** them in favour of the Appellant's submission that Mr Traynor's annual increment would have

been 5 per cent. In our judgment, there is no basis for Ms Kuah's submission and we dismiss this aspect of the Respondents' appeal.

210 However, we note that the Judge's findings in this regard were predicated on his overall finding that Mr Traynor would have lived for four more years. Given our holding in this regard, while we affirm his finding on the annual salary increment of 5 per cent for the next four years, we remit the matter as to what Mr Traynor's annual salary increment would have been for the subsequent years (if any) for the Judge's determination.

The Dependency Claim

211 In assessing a dependency claim, the central principle is the dependent's reasonable expectation of pecuniary benefit from the deceased. The simplest method of assessing that pecuniary benefit is to make a direct assessment of the value of the dependent's expectation (see the High Court's decision in *Gul Chandiram Mahtani and another (administrators of the estate of Harbajan Kaur, deceased) v Chain Singh and another* [1998] 2 SLR(R) 801 at [17]–[18]).

212 There are generally two methods for assessing a dependency claim (see the High Court's decision of *Hanson Ingrid Christina and others v Tan Puey Tze and another appeal* [2008] 1 SLR(R) 409 ("*Hanson Ingrid Christina*") at [26]):

> (a) The court can add together the value of the benefits received by the dependents from the deceased ("the traditional method"). Where the traditional method is employed, the dependent must prove the value of the benefit received by him or her from the deceased (see the High Court's decision of *Sulastri bte Achmad v Tan Hee Hang and another* [2017] SGHC 7 ("*Sulastri*") at [33]); or

(b) The court may deduct a percentage from the deceased's net salary consisting of his or her exclusively personal expenditure ("the percentage deduction method"). The "conventional figure" ascribed to the deceased's personal expenditure is 25 per cent in the case of a family with two children (see *Sulastri* at [33]).

The parties' cases on the Dependency Claim in the court below

213 The Appellant divided her Dependency Claim into pre-trial dependency losses (corresponding to the four years of life expectancy the Judge found), and the post-trial dependency losses, which the Judge rejected (see the Judgment at [21]). We focus first on the pre-trial dependency losses, which the Appellant claimed to the tune of $1,154,057.01.

214 The Appellant relied on the traditional method of calculation. This included the following:

(a) Mr Traynor personally coached his daughters, Kate and Emily, in mathematics. The Appellant testified that since his death, she had had to send them for mathematics tuition. The value of Mr Traynor's mathematics coaching amounted to $28,770 for four years;

(b) Mr Traynor paid Kate's and Emily's education expenses. These would have amounted to $308,660 for the four years after Mr Traynor's death; and

(c) Mr Traynor carried out computer and household maintenance, decorations and improvements to their family home. This amounted to $9,247 for the four years.

215 The Judge accepted these claims and awarded her a total of $346,677 (see the Judgment at [26] and [30]). We note that aside from generally contesting an award of damages on the Dependency Claim on the basis of the Breach and Causation Questions, and the number of years involved in the award, the Respondents have not sought to challenge the Judge's findings on the quantification of the mathematics coaching, the education expenses, or the household maintenance sums. Rather, their primary contention was that the Judge should have used the percentage deduction method instead.

216 The Appellant also claimed that the Traynor family's annual expenses amounted to $243,000. However, she conceded in her closing submissions that she was unable to furnish evidence of the exact proportion of the family expenses spent on Mr Traynor, herself and their children. It seems to us that while still relying on *the traditional method* overall, she nevertheless sought to use the conventional percentages within the percentage deduction method for the *family's annual expenses* to claim a 75 per cent portion for the dependents (excluding Mr Traynor's alleged 25 per cent share of the family's annual expenses).

217 The Judge rejected the Appellant's submission in this regard, holding that under the traditional method she was required to prove even this postulated percentage. Although he accepted that Mr Traynor had spent $243,000 annually on expenses, he did not award any proportion of this amount to the dependents. For completeness, he also rejected the Respondents' submission to utilise the percentage deduction method because that would only have been appropriate where "virtually all net earnings are spent on living expenses" (see *Hanson Ingrid Christina* at [26]). In the present case, even on the Respondents' case that Mr Traynor's annual income was only $308,386, this was much more than the $243,000 in living expenses (see the Judgment at [26]–[31] and [37]).

The parties' cases on the Dependency Claim on appeal

218 On appeal, the Appellant argued that the Judge was wrong to have removed the entire benefit of the Traynor family's annual expenses of $243,000. She maintained that the conventional figures under the percentage deduction method could similarly be applied to apportion the family expenses. Mr Kronenburg pointed out that since the Judge had accepted that Mr Traynor's annual expenses were $243,000 for the purposes of the Loss of Inheritance Claim, it was wrong to have removed the benefit of this sum for the Dependency Claim.

219 The Appellant further submitted that even if she could not prove the exact percentage under the traditional method, the dependents should nevertheless be awarded a "reasonable portion" of the family's annual expenses. She relied on *Sulastri*, where the High Court at [57]–[58] rejected the plaintiff's claim for a 90 per cent share of the deceased's income, and instead considered that awarding her a 60 per cent share of his income under the traditional method would not be unreasonable. In this regard, the Appellant submitted that what would be a "reasonable portion" of the annual family expenses would still be 75 per cent.

220 In contrast, the Respondents continued to submit that the percentage deduction method should be used. Their accounting expert, Mr Potter, had estimated that 75 per cent of Mr Traynor's total income (and not only the family expenses) would have been spent on the dependents as long as the daughters were undergoing full-time education. Ms Kuah submitted that the use of the percentage deduction method would support the Dependency Claim and Loss of Inheritance Claim being calculated collectively. She also submitted that the Judge had erred in accepting that the family's annual expenses were $243,000.

Our analysis of the Dependency Claim

221 In our judgment, the Judge had not erred in rejecting the Appellant's use of the conventional figures for the purposes of apportioning a sum from the family's annual expenses. In so far as the Appellant was attempting to *assert* that the percentage of 75 per cent of the $243,000 would have been expended on the dependents, it was incumbent upon her to prove those percentages under the traditional method.

222 Ms Kuah submitted that what the Appellant was trying to do was to "have her cake and eat it". There was some force in the submission. In effect, what the Appellant was doing was relying on the traditional method for the purposes of *portions* of Mr Traynor's expenditure (*eg*, the average of $77,165 of educational expenses per year), and where she could not prove *other portions* (*ie*, the proportions within the family's annual expenses) rely on the conventional percentages available within percentage deduction method.

223 Mr Kronenburg sought to rely on the English Court of Appeal's decision in *Harris v Empress Motors Ltd* [1984] 1 WLR 212 ("*Harris*"), which was cited in *Sulastri* at [33]. In that case, O'Connor LJ explained the conventional percentages used in the percentage deduction method as follows (at 217):

> …In times past the calculation called for a tedious inquiry into how much housekeeping money was paid to the wife, who paid how much for the children's shoes, etc. This has all been swept away and the modern practice is to deduct a percentage from the net income figure to represent what the deceased would have spent exclusively on himself. The percentages have become conventional in the sense that they are used unless there is striking evidence to make the conventional figure inappropriate because there is no departure from the principle that each case must be decided upon its own facts …

224 Mr Kronenburg suggested that the use of the conventional figure was

appropriate because it was unreasonable for a normal family to keep track of the exact apportionment of expenses within the family.

225 We are unable to agree with Mr Kronenburg's suggestion. While it is true that the conventional percentages can in the appropriate case obviate a minute and painstaking inquiry into the proportions spent from *total* net income, Mr Kronenburg's approach was a ***piecemeal*** one applied to only a *portion* of Mr Traynor's net income. Because the Appellant would avail herself of 100 per cent of whatever she could prove under the traditional method, but at least 75 per cent of whatever she could not prove under the percentage deduction method, she would by definition get *more* than the 75 per cent she would have received under the percentage deduction method. In the circumstances, we agree that the Judge was correct to have found that the Appellant had failed to discharge her burden of proof as to the percentages of the family's annual expenses she was seeking for the dependents.

226 We also agree with the Judge that the Respondents' argument in favour of the percentage deduction method should be rejected. It is clear that not all of Mr Traynor's earnings were spent on living expenses.

227 We turn to Mr Kronenburg's other submission that a "reasonable portion" of the family's annual expenses should be awarded. This submission was made for the first time on appeal, and we find ourselves hesitating to adopt this approach as well. In *Sulastri*, which Mr Kronenburg referred to, under the traditional method, the High Court fixed a 60 per cent proportion of the deceased's *income* as opposed to a subset of the income (*ie*, the family's expenses).

228 In the decision of *Zhang Xiao Ling (personal representative of the Estate*

of Chan Tak Man, deceased) v Er Swee Poo and Another [2004] SGHC 21 ("*Er Swee Poo*"), referred to in *Sulastri* at [57], an assistant registrar rejected the plaintiff's estimate of the living expenses spent on her and their children (at [10]). However, she accepted that the deceased was a very frugal man who spent very little on himself and estimated that only 25 per cent was spent on his personal expenditure, and $250 a month on his parents, leaving the rest of his *disposable income* to his dependents (at [21]).

229 Aside from the fact that *Er Swee Poo* and *Sulastri* involved the award of a "reasonable portion" of the total income and *not* a reasonable portion of a proportion of that income, we also note that the High Court in *Sulastri* had reasoned (at [39]) that if the plaintiff was seeking more than the conventional percentage for the dependents (*ie*, 90 per cent), she must furnish evidence to support that claim. We therefore are not inclined towards the Appellant's claim that, even if the dependents were entitled to a "reasonable portion", we should allocate 75 per cent of the family's annual expenses to the dependents.

230 However, we accept that at least ***some proportion*** of the Traynor family's expenses would have been spent on the dependents. We are guided by three reasons.

231 First, the Judge had accepted that $243,000 would have been spent annually by Mr Traynor as part the family's annual expenses (albeit for the purposes of the Loss of Inheritance Claim) (see the Judgment at [27] and [37]). It follows that some amount of this must have been spent on the Appellant, Kate and Emily, since they make up the rest of the family. In making this observation, we do not fault the Judge for deciding not to assign a proportion of those expenses to the dependents. After all, as he correctly noted, the burden of proof was on the Appellant to prove the 75 per cent she was seeking. Moreover, the

"reasonable portion" argument was not raised before him.

232 Second, there is no dispute that this was a single-income family, where Mr Traynor was the sole provider, with the Appellant as a housewife. The Appellant described Mr Traynor as a "responsible and caring husband and father" who "paid for all the household expenses" and "all family holidays". The Respondents candidly agreed that Mr Traynor was the sole source of income for his family and that there was no evidence that Mr Traynor would have incurred expenses on anyone else or on other pursuits. Hence, the facts clearly show that the dependents must have had some form of subsistence. Given the Judge had held that Mr Traynor spent $243,000 on expenses, and there is no evidence of any other source of income to provide for the Appellant, Kate, and Emily's subsistence, it is plain that at least some part of the $243,000 went towards catering for their necessities.

233 Third, it was the *Respondents'* own accounting expert, Mr Potter's, evidence that 75 per cent of Mr Traynor's income would be spent on the dependents. While the Respondents relied on this evidence to support the percentage deduction method (as opposed to the traditional method which the Appellant favoured), even on the Respondents' calculations of Mr Traynor's post-tax income (of $308,386 on the Respondents' case), he would still have expended some $231,239.50 annually, which was more than the amount the Judge had awarded for the Dependency Claim if it was subdivided on an annual basis ($346,677 for four years).

234 As we have alluded to above, in assessing a dependency claim, the central principle is that of the dependent's reasonable expectation of pecuniary benefit. This court has observed that there does not have to be distinct evidence of pecuniary advantage in existence, and it suffices that there is some basis of

fact from which such an inference of such an advantage can be drawn (see *Zhu Xiu Chun (alias Myint Myint Kyi) v Rockwills Trustee Ltd (administrators of the estate of and on behalf of the dependants of Heng Ang Tee Franklin, deceased) and other appeals* [2016] 5 SLR 412 ("*Rockwills*") at [91] and [102]).

235 In the present case, there was an ample basis for the inference to be drawn that Mr Traynor would have provided for the dependents out of the family's annual expenses. Indeed, the Judge had implicitly made such a finding. The difficulty pertained to (and which the Appellant had failed to prove) the ***extent*** of those annual expenses. In our judgment, it would be fair to say that *half* of the $243,000 would have been spent on the dependents. We should stress that our holding here does not relieve a plaintiff under the traditional rule from the duty of proving the benefits that accrue to the dependents. However, assessments of dependency claims ultimately turn on the facts. And given that the Judge had found that there was evidence to support the Traynor's annual family expenses, the reasonable, indeed inexorable, inference was that some proportion of this had to be allocated to his dependents.

236 However, we do not agree that 75 per cent of the $243,000 would have been a reasonable portion of the dependents' expenses. It was the Appellant's own evidence that the family rarely dined out. Mr Abu testified that the big-ticket items were education expenses (which we calculated at [222] above were approximately $77,165 per year). It stands to reason that there were no other big-ticket family expenditure items that could justify as large a sum as 75 per cent of $243,000 going toward the dependents' expenditure.

237 Moreover, according to Mr Abu, the Appellant had told him that for the purposes of calculating the post-retirement expenses for herself and Mr Traynor, their total annual expenses would only amount to $77,910 (with

$25,890 for household expenses). Although these were figures the Appellant had projected for their post-retirement expenses, we do not think they were an entirely far removed indicator of what their current spending would have been. Even after including Kate's and Emily's expenses, we do not think this would approach anywhere near 75 per cent of $243,000.

238 Allocating the Appellant 50 per cent of the Traynor family's annual expenses ($121,500) is, in our view, fair given that after adding the educational expenses the dependents were awarded, this would still be less than the amount the Appellant could avail herself of under the percentage deduction method, and which the Respondents had submitted should be used. Accordingly, we remit this annual sum of $121,500 of the pre-trial dependency claim to the Judge for the appropriate multiplier-multiplicand to be applied. For completeness, we affirm the Judge's findings on the other aspects of the pre-trial dependency claim (at [214] above) *vis-à-vis* Mr Traynor's mathematics coaching, education expenses, and household maintenance. We would add that it is now necessary for the Judge to determine whether these sums (and increments, if any) should be awarded as part of the post-trial dependency claim.

239 The Judge had found it unnecessary to make a finding on the post-trial dependency claim. However, given our holding on the fact that Mr Traynor would have been cured, we also allow the Appellant's appeal on this claim and remit the determination of those sums and the application of the appropriate multiplier-multiplicand to the Judge for his determination.

240 We further remit the question of whether interest should be awarded on the pre-trial dependency claim.

The Loss of Inheritance Claim

241 The Appellant similarly divided the Loss of Inheritance Claim into two amounts, a pre-trial loss of inheritance claim (corresponding to the four years the Judge found Mr Traynor would have survived) and a post-trial loss of inheritance claim, respectively.

The parties' cases on the Loss of Inheritance Claim

242 The Appellant relied on Mr Abu's estimate that Mr Traynor would have earned $450,000 per year. Subtractions were made for the annual expenditure of $243,000, as well as for Kate's and Emily's educational expenses. This left additional sums for savings for each year from 2012 to 2017. This resulted in a pre-trial loss of inheritance claim of $894,657.

243 In so far as the post-trial loss of inheritance claim is concerned, Mr Abu estimated that Mr Traynor would have been employed until the age of 67 and that he would have lived until the age of 82. After factoring an annual income increment of 5 per cent, applying a discount rate of 2.55 per cent, and deducting post-retirement expenses of $77,910 annually, Mr Traynor's total savings would have led to a post-trial inheritance claim of $4,122,790.

244 The Respondents' case before the Judge was substantially similar to their case on appeal. They also adopted similar positions as to the Dependency Claim. First, it was submitted that Mr Traynor's annual income would not have been $450,000, but instead his post-tax income should have been $308,386 (see [202] above). In addition, they argued that Mr Traynor's salary increment would not have been 5 per cent (see [207] above).

245 Second, the Respondents submitted that the family's annual expenses

were not $243,000. Instead, they contended that the percentage deduction method should be used. On appeal, it was contended that the Judge had erred in accepting this figure of $243,000 as Mr Abu had relied upon bank statements which would not have contained full details about whether the expenses were for the family (see [220] above).

246 Third, it was argued that the Loss of Inheritance Claim should be calculated collectively with the Dependency Claim, because any amounts Mr Traynor did not spend on himself or the dependents would have become saved and accumulated as part of the Loss of Inheritance Claim.

247 Fourth, it was submitted that Mr Traynor would have retired at the age of 62.

Our analysis on the Loss of Inheritance Claim

248 We deal first with the pre-trial loss of inheritance claim. It follows from our holdings at [206] and [209] above that we accept the Respondents' submission that Mr Traynor's post-tax income should be $308,386. However, we reject their submission as to Mr Traynor's salary increment, and affirm the Judge's finding that at least four years after his death, it would have increased by 5 per cent per annum.

249 We reject the Respondents' submission that Mr Traynor's annual expenses would have been more than $243,000 (therefore leaving less to his estate for the purposes of inheritance). We agree with the Judge that Mr Abu had carefully listed the expenses in Mr Traynor's bank statements, and had already made reasonable deductions for investments and for educational expenses (see the Judgment at [30]). On appeal, Ms Kuah submitted that the Appellant had not furnished a methodology as to how the expenses were

calculated. She also submitted that after the deductions were made for property and equity investments, and it could not be verified if the remainder were family expenses. However, we disagree with Ms Kuah's submissions. Mr Abu had stated in his report that he had arrived at the figure of $243,000 in family expenses by first taking the *total expenditures* reflected in Mr Traynor's bank statements from 2011 to 2013 and then deducting expenses that should not be included in the annual expenditures as such (*eg*, investments, non-recurring medical fees, home mortgage payments, and educational expenses). He then arrived at an average figure of approximately $243,000 (across 2011 to 2013). The fact that the estimated figures that Mr Abu calculated over the three years was fairly stable (in the range of $218,323 to $278,476) further suggested to us that Mr Abu's calculations were a reasonable indicator that this was the sum Mr Traynor expended annually on the Traynor family.

250 We turn to the Respondents' submission on collectively computing the Loss of Inheritance Claim and the Dependency Claim. Ms Kuah submitted that the heads of claim were inversely related. Given Mr Traynor had a single source of income, the more he spent on the dependents, the less he would have accumulated in savings. She submitted that the Judge had erred when he held that he "[did] not accept that the Dependency Claim and the Loss of Inheritance Claim should be calculated together" (see the Judgment at [23] and [37]).

251 While we see the force of Ms Kuah's submission, we do not take the Judge's holding at [23] and [37] of his Judgment to mean that the court should ignore any overlap in the variables for both Claims. Rather, it seems to us (as shall be seen in a moment) that the Judge's comments were confined to applying different calculations for the *multiplier-multiplicands* of the Dependency and Loss of Inheritance Claims and not to the *variables*.

252 As to the variables, we agree there *may* be an overlap as to the value of the dependency per year, which is the multiplicand for a dependency claim (see *Sulastri* at [20]) and the value of the savings of the deceased per annum, which is the multiplicand for a loss of inheritance claim (see *Rockwills* at [125(a)]). There is therefore a need for caution when assessing both claims. That said, it does not appear to us that the Judge had erred in substance.

253 First, both parties' accounting experts appear to have used essentially the same methodology as to the variables to prevent overlaps between the Claims. To assess Mr Traynor's savings, the Respondents' expert, Mr Potter, deducted the amounts spent on the dependents' maintenance from Mr Traynor's income. The Appellant's expert, Mr Abu, had *similarly* taken Mr Traynor's estimated annual income and made deductions for, among other things, the Traynor family's annual expenses of $243,000 and Kate's and Emily's educational expenses.

254 Second, and on this point, the Judge was nevertheless careful to indicate that certain *exceptional* items such as the one-off medical expenses, or the down payment for the Traynor's family house should not be factored into the calculation of what Mr Traynor's annual savings should have been (see the Judgment at [37]). This seems to us to be a sensible way of determining what Mr Traynor's annual savings would actually have been, and we do not consider the Judge to have erred in this regard.

255 However, it will be clear that given our finding that Mr Traynor's annual post-tax income would have been $308,386 (and not $450,000), after making deductions for annual expenses of $243,000 and the educational expenses as Mr Abu had done, there may not have been substantial sums channelled towards savings for the purposes of the pre-trial loss of inheritance claim, even after

factoring in a 5 per cent annual salary increment. Indeed, any amounts that went toward the Loss of Inheritance Claim may also need to factor in the substantial home mortgage payments of approximately $75,000 per annum that Mr Traynor had been making toward the family home since 2012. Depending on the Judge's findings on the Appellant's Loss of Appreciation Claim, it may be that the mortgage payments should be considered under this Claim (if at all).

256 Accordingly, we reverse the Judge's award of $894,657 with regard to the pre-trial loss of inheritance claim and remit the matter for his determination.

257 We turn to [23] of the Judgment, where the Judge alluded to this court's observations in *Rockwills* as to the use of different multiplier-multiplicands. As we stated earlier, this makes clear that his comments about separate calculations were confined to the multiplier-multiplicands and not the variables. In this regard, we agree with the Judge that the Respondents' submission was incorrect as a matter of law and that the Loss of Inheritance Claim and Dependency Claim should be calculated separately for the purposes of the multiplier-multiplicand.

258 In the context of a dependency claim, the multiplier is the number of years for which a dependent can claim for his or her loss (with a discount for accelerated receipt and the vicissitudes of life), while the multiplicand is the annual value of the dependency. However, in the context of a loss of inheritance claim, the multiplier must also be adjusted to reflect the post-retirement expenses of the deceased (see *Rockwills* at [123]). The multiplicand is the savings of the deceased per annum.

259 Although there are many similarities between the multiplier-multiplicand approaches for the loss of inheritance claim and the dependency claim, it will be obvious that there will be differences, not least in the

adjustments for post-retirement expenses. Moreover, as this court had observed in *Rockwills* at [138], there is also a difference in the discounts to be applied to the Loss of Inheritance Claim in terms of the accelerated receipt rate (since the inheritance would only be received when Mr Traynor lived to his full life expectancy) and the Dependency Claim (which would be received upfront). The Judge was clearly alive to this distinction (see the Judgment at [23]). Accordingly, we reject the Respondents' appeal in this regard.

260 We allow the Appellant's appeal with regard to the post-trial loss of inheritance claim. As we had indicated at [197] and [199] above, this would depend upon the Judge's determination of Mr Traynor's full life expectancy and the appropriate multiplier-multiplicand(s) to be applied. It will also be necessary for the Judge to make determinations on, among other things, Mr Traynor's retirement age, his annual salary increment past the four years subsequent to his death, educational expenses for Kate and Emily past the four years (and increments if any) and his post-retirement expenses and savings. Accordingly, we remit these issues to the Judge for him to reach the appropriate sum for the post-trial loss of inheritance.

The Loss of Appreciation Claim

261 In the court below, the Appellant claimed for the loss of appreciation for their family home. Mr Traynor had purchased their home on 16 September 2011 for $2,300,000. According to Mr Abu's report, Mr Traynor had paid a down payment of $345,106 in cash for the home. He continued to finance the mortgage at approximately $75,000 in 2012 and 2013 until his death. The Appellant had personally financed the mortgage until 13 September 2016, when she was forced to sell it at $2,740,000 as she needed funds to pay for Kate's and Emily's educational expenses, as well as for general living expenses.

262 The Appellant contended that Mr Traynor would have continued financing the mortgage and would had set aside the sum of $7,500 per month for this purpose. If the family had not been forced to sell the house, they would have kept it for 15 more years until Mr Traynor's retirement. She estimated that since the value of the house had appreciated at the rate of approximately $100,000 per annum from 2011 to 2016, the total appreciation in its value would have been $1,500,000. These appeared to have been based on her own projections.

263 As already noted, the Judge had dismissed the Loss of Appreciation Claim because this assumed that Mr Traynor would have lived to his full life expectancy (see the Judgment at [39]). Although we have reservations that the Appellant's claim was supported by the evidence she had adduced, the basis of the Judge's dismissal would require us to remit this claim for his determination. However, we would make the observation that it would also stand to reason that if there was to be an award on the Loss of Appreciation Claim, a substantial proportion of Mr Traynor's annual income would be consistently channelled toward the mortgage payments thereby having implications for the Loss of Inheritance Claim (see [250] above).

The Estate Claim

264 The Appellant also claimed at trial the following sums under the broad heading of the Estate Claim, which she maintained on appeal:

(a) Medical expenses amounting to $579,087.44;

(b) Funeral expenses amounting to $25,347.54;

(c) Out of pocket expenses amounting to $3,964.55;

(d) Grant of probate amounting to $8,000;

(e) Bereavement amounting to $15,000; and

(f) Pain and suffering amounting to $50,000.

265 In total, this amounts to $681,399.53, for which she further claimed 5.33 per cent of interest per annum from date of writ to the date of judgment.

266 The Judge dismissed this claim as it was his view that Mr Traynor would have eventually succumbed to malignant melanoma, albeit four years later. Accordingly, he rejected the Estate Claim (see the Judgment at [40]).

267 At trial, the Respondents conceded that if Mr Traynor was found to live to his full life-expectancy then the following amounts should be paid:

(a) Funeral expenses amounting to $23,000;

(b) Grant of probate amounting to $8,000; and

(c) Pain and suffering amounting to $100,000.

268 On appeal, Ms Kuah submitted that if some degree of causation was found, then the Appellant would only be entitled to $15,000 for bereavement under section 21 of the Civil Law Act.

Our analysis of the Estate Claim

269 In our judgment, the following amounts were conceded by the Respondents and should therefore be awarded in full:

(a) Grant of probate amounting to $8,000;

(b) Pain and suffering for $50,000 (corresponding to the lower amount the Appellant submitted); and

(c) Bereavement damages of $15,000.

270 As for the funerary expenses, medical expenses and out of pocket expenses, we remit these matters to the Judge for his determination. We would make the observation that it appears that Mr Traynor may have incurred similar medical expenses even if his melanoma had been successfully treated in 2009. This would have included procedures such as the wide-excision procedure. Accordingly, the costs of those treatments may have to be excluded. Indeed, the very basis for the Appellant's claim was that he had, or would have availed himself of those procedures (see [172] and [181] above). We also note that the basis for the Appellant primary claim of a cure would necessarily entail Mr Traynor availing himself of SLNB, and as such the cost of such a procedure would also have to be deducted from any eventual award.

Summary of our holdings on the Damages Question

271 In summary, we make the following holdings on the Damages Question:

(a) We reverse the Judge's findings on Mr Traynor's annual income and hold that his post-tax income would have been $308,386;

(b) We affirm the Judge's finding that Mr Traynor's annual salary increment would have been 5 per cent from 2013 to 2017, but remit the matter as to what Mr Traynor's future salary increment (if any) would have been for the Judge's determination;

(c) We remit the determination of the Dependency Claim for the Judge's consideration with the following parameters:

(i) We affirm the Judge's findings on the value of Mr Traynor's mathematics coaching, educational expenses, and household maintenance, and remit the determination of whether such sums (and increments, if any) should be awarded as part of the post-trial dependency claim ;

(ii) We reverse the Judge's findings on the removal of the entirety of the Traynor's family annual expenses amounting to $243,000 to the dependents, and attribute a sum of $121,500 as the dependents' expenditure and $121,500 as Mr Traynor's personal expenditure;

(iii) We remit the determination of the appropriate multiplier-multiplicand(s) to be applied as to the Dependency Claim;

(iv) We remit the determination of whether additional components of the post-trial dependency claim, such as driving lessons, should be awarded; and

(v) We remit the determination of whether pre-judgment interest should be awarded on the pre-trial dependency claim.

(d) We remit the determination of the Loss of Inheritance Claim for the Judge's consideration with the following parameters:

(i) We affirm the Judge's decision to calculate the Loss of Inheritance and Dependency Claims separately for the purposes of the multiplier-multiplicand;

(ii) We affirm the Judge's finding that the Traynor family's annual expenses were $243,000;

(iii) We remit the determination of Mr Traynor's retirement age, post-retirement expenses and full life expectancy for the Judge's consideration; and

(iv) We remit the determination of the appropriate multiplier-multiplicand(s) to be applied to the Loss of Inheritance Claim.

(e) We remit the total sum (if any) to be determined under the Loss of Appreciation Claim.

(f) We remit the determination of the Estate Claim for the Judge's consideration:

(i) We award the full sums for the grant of probate ($8,000), bereavement ($15,000), and pain and suffering ($50,000);

(ii) We remit the determination of the funerary expenses, medical expenses, and out of pocket expenses for the Judge's consideration; and

(iii) We remit the determination of whether pre-judgment interest should be applied to any award on the Estate Claim.

Conclusion

272 In summary:

(a) We allow the Appellant's appeal in Civil Appeal No 70 of 2018 ("CA 70") as to the Causation Question, as well as in part with regard to the Damages Question;

(b) We dismiss the Respondents' appeals in Civil Appeal No 71 of 2018 ("CA 71") and Civil Appeal No 72 of 2018 ("CA 72") with regard to the Breach Question and the Causation Question; and

(c) We allow the Respondents' appeals in CA 71 and CA 72 in part with regard to the Damages Question.

273 We are grateful for the assistance of the learned *amicus curiae*, Prof Chan, whose submissions, painstaking research and compendious survey of the authorities and commentaries we found invaluable in helping us resolve several of the legal and theoretical issues we encountered. However, it has transpired that it is unnecessary for us to determine the controversy surrounding the loss of a chance doctrine, which we reserve for an appropriate case in the future.

274 The Judge had reserved the costs of the trial for determination after the hearing of this appeal. As for the costs of these appeals, the Appellant asked for a total of $98,672.05 (inclusive of disbursements, $5,189.52 of which had been paid by the Respondents), while the Respondents asked for a total of $107,760.02 (inclusive of disbursements).

275 The result of our findings on the Causation Question led to a reversal of several of the Judge's awards in relation to the Damages Question. Here, the Respondents had succeeded in part in CA 71 and CA 72 as to aspects of the Damages Question. This was therefore not an appropriate case for the entirety of the costs to be awarded to the Appellant.

276 In the circumstances, we order the Respondents to pay the Appellant $75,000 for the costs of the appeal (inclusive of disbursements).

Sundaresh Menon Chief Justice	Andrew Phang Boon Leong Judge of Appeal	Judith Prakash Judge of Appeal

Tay Yong Kwang Judge of Appeal	Belinda Ang Saw Ean Judge

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Prof Gary Chan Kok Yew (School of Law, Singapore Management University) as *amicus curiae*.