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SJC-10051

ANTHONY RENZI, administrator,[1] vs. SANTIAGO PAREDES & another.[2]

Essex. March 4, 2008. - July 23, 2008.

Present: Marshall, C.J., Greaney, Ireland, Spina, Cowin, Cordy, & Botsford, JJ.

Negligence, Doctor, Medical malpractice, Wrongful death, Loss of chance. Medical Malpractice, Complaint. Wrongful Death. Damages, Wrongful death, Loss of chance, Apportionment. Evidence, Photograph, Best and secondary. Practice, Civil, Instructions to jury. Joint and Several Obligation.

Civil action commenced in the Superior Court Department on May 3, 2001.

The case was tried before Patrick J. Riley, J.

The Supreme Judicial Court granted an application for direct appellate review.

Tory A. Weigand (Peter C. Knight & William J. Davenport with him) for the defendants.
Annette M. Gonthier Kiely (Maura L. Sheehan with her) for the plaintiff.
John J. Barter, for Professional Liability Foundation,

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[1] Of the estate of Mary Jane Renzi.

[2] Associated Radiologists of Boston, Inc. Paredes died in November, 1999. Although his death preceded the filing of the complaint, Paredes and not his estate was named as the defendant, a convention that the parties have continued throughout the litigation.

amicus curiae, submitted a brief.

Paul F. Leavis, Michael J. Harris, & J. Michael Conley, for Massachusetts Academy of Trial Attorneys, amicus curiae, submitted a brief.

MARSHALL, C.J. Today we recognize loss of chance of survival as a theory of injury in a wrongful death action predicated on medical negligence, where the decedent's chances of survival were less than even prior to the physician's negligence. See Matsuyama v. Birnbaum, ante (2008) (Matsuyama). See also G. L. c. 229, § 2. In this case, we principally consider whether loss of chance damages are recoverable where the physicians' negligence reduced the decedent's chances of survival from a better than even chance to one less than even, and where the jury found the defendant physicians not liable for causing the decedent's wrongful death. We conclude that the rationale for adopting the loss of chance doctrine is no less compelling here, where the physician's negligence reduced a better than even chance of survival to a less than even chance, than it was in Matsuyama, where the decedent's prenegligence chance of survival was never better than even. However, because of errors in the special verdict questions, which we describe below, we are constrained to remand this case for a new trial, limited to the issue of damages. On all other matters appealed by the defendants, we affirm.

1. Background. The jury could have found as follows: In

[3] In this wrongful death action, we use the terms "loss of chance of survival" and "loss of chance of a more favorable medical outcome" synonymously. See Matsuyama v. Birnbaum, ante (2008) (Matsuyama).

1993, Mary Jane Renzi was a forty-eight year old tenured teacher in the Saugus public school system. She was married and a mother of two children, for one of whom, a daughter who was profoundly deaf and had mobility impairments, she was the principal advocate and caretaker. In December, 1993, Renzi saw Dr. Lavonne Veatch, an internal medicine physician, for an annual physical examination. Veatch's notes of the examination described both of Renzi's breasts as "multinodular." Those notes also included a drawing of Renzi's breasts, on which the physician placed a black dot on the left breast, and a smaller dot on the right breast. Veatch ordered no further testing or examination of Renzi's breasts, although, as she testified, she was aware at that time that the highest percentage of "malignant regions" in right-handed women such as Renzi was in the area noted on Renzi's left breast. Renzi's routine screening mammogram in January, 1994, was read as normal.

In December, 1994, Renzi returned to Veatch's office, where she was diagnosed with hidradenitis (inflammation of sweat glands in the armpit) and prescribed a course of antibiotic treatment. Veatch's records show no breast examination during that visit.

In January, 1995, Dr. Santiago Paredes, a radiologist, performed a mammogram on Renzi. On Paredes's "radiologic consultation" form was the handwritten note "Consult." The

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[4] Renzi had been going for annual mammography screenings since at least 1990.

report documented that Renzi reported feeling a lump in her breast, and that Veatch's office had reported a clinical history of "large [increase] in [left breast] tissue at 12:00." Paredes performed a routine screening mammogram, and not a diagnostic mammogram, which would have focused on the areas indicated as problematic. He compared the mammogram to the mammogram performed in 1994. His report, which he forwarded to Veatch, read: "No changes are observed when compared with study done one year ago. No suspicious lesions observed in either breast." Veatch took no action in response to the report.

In July and August, 1995, Veatch continued to treat Renzi for hidradenitis in her left armpit, but noted a continued tenderness in Renzi's left breast, which the physician characterized in her August notes as "worrisome." That month, Veatch ordered a diagnostic mammogram. After a needle biopsy, Renzi was diagnosed with Stage 3B inflammatory breast cancer (IBC) (infiltrating ductal carcinoma with lymph node involvement), with a ten-centimeter mass in her left breast. She underwent chemotherapy, bone marrow transplant, radical mastectomy, radiation, and hormone therapy. Despite this treatment she developed further metastatic disease in the bone and brain. Renzi died at age fifty-four in November, 1999, of metastatic breast cancer.

This action was brought by Renzi's husband, Anthony Renzi, as administrator of her estate (plaintiff), on his amended complaint against Veatch, Paredes, and Associated Radiologists of

Boston, Inc. (Associated Radiologists), jointly and severally, for wrongful death, conscious pain and suffering, and gross negligence. A jury trial commenced in March, 2005. Both parties called a number of expert witnesses. Here we summarize only the expert testimony germane to this appeal.

Dr. Yolanda Adler, a radiologist, testified for the plaintiff that Paredes deviated from the standard of care by, among other things, not referring to Renzi's clinical history when he read her mammogram, conducting a screening rather than a diagnostic mammogram, failing to notice an "obvious spectacular change" from the 1994 to 1995 mammogram films, and mischaracterizing the 1995 mammogram as "normal." She further opined that, had an ultrasound been ordered in January, 1995, as medically indicated, it would likely have been positive and led to a biopsy revealing the cancer.

Another plaintiff's expert, Dr. John Glick, an oncologist, testified that Veatch deviated from the standard of care by failing to follow up within six months of the initial December, 1993, examination on the nodule on Renzi's left breast that she had described as "dominant" and noted in her own records; by failing to conduct an adequate physical examination or breast examination in December, 1994; and in January, 1995, by failing to contact the patient and order further tests in response to Paredes's radiology report indicating that Renzi felt a lump in her left breast.

Glick also told the jury that the "prognosis of breast

cancer is very complex" and that it is characterized by a system of "staging," or grading, the severity of the cancer to determine the appropriate treatment. See Matsuyama, supra at . He testified that the lower the stage at diagnosis, the higher the chances of survival, and opined that Renzi's cancer was "diagnosable" in December, 1993, and June, 1994. Had the cancer been detected at that time, he testified, Renzi "would be alive and with her family today." He testified to a reasonable degree of medical certainty that, had Renzi's cancer been detected in June, 1994, it would have been either stage 1 or stage 2A breast cancer, and that if the cancer had been stage 1, Renzi's chance of "ten year disease free survival" would have been 88% to 90%; if the cancer had been stage 2A, her ten-year survival rate would have been 73%. Had the cancer been diagnosed in January, 1995, he stated, Renzi's cancer would have been either stage 2B or stage 3A, which would have given Renzi a 58% chance of ten-year survival. He also told the jury that in August, 1995, when Renzi's cancer actually was detected, she was stage 3B, with a 30% chance of ten-year survival, a decrease of twenty-eight percentage points.

For the defense, Dr. Ferris M. Hall, a specialist in

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[5] Glick testified that, after ten years free of cancer, a breast cancer patient is considered "cured," although in "extraordinarily rare" cases cancer might recur in this population. He noted that the "universal staging system" for breast cancer was developed by the American Joint Commission on Cancer and is widely used by internists, gynecologists, and other medical professionals.

radiology and internal medicine, testified that Paredes did not commit a breach of the standard of care with regard to his conduct and interpretation of the January, 1995, mammogram. Dr. Michael Stone, a surgical oncologist, also testified for the defense. He opined that Renzi's cancer was of such sudden and virulent nature that no harm or loss of survival could be attributed to Paredes's actions. He testified that Renzi's particular type of breast cancer was of such "very bad biology" that "by the time we see it and make the diagnosis, it's already exploded throughout the breast." Even had it been detected in January, 1995, Stone told the jury, Renzi's cancer would have been "the worst category of Stage 3A breast cancer which has an annual mortality rate "of 20%," or essentially the same survival rate of Renzi's stage 3B cancer detected in August, 1995. Over the plaintiff's objection, Stone also averred that, while staging

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[6] For example, this exchange occurred during Stone's testimony:

The judge: "All right. So the type of cancer that she did have was fatal, notwithstanding anything Dr. Paredes did or didn't do? Is that correct?"

The witness: "I think that is."

[7] Stone agreed with the testimony of Glick that breast cancer prognosis was expressed as a series of stages from 1 through 4, that lower stages indicate greater likelihood of cure, and that Renzi's cancer was stage 3B when it was detected in August, 1995.

[8] In somewhat different terms, Stone also testified that the form of Renzi's cancer in August, 1995, "is almost always fatal, but approximately 10 to 20% of patients will, 20% perhaps, will survive ten years, 35% will be alive at 5 years."

is a predictor for breast cancer, outcome is largely determined by individual factors, including genetics.

The plaintiff's forensic economist was Dr. Allan S. McCausland. He testified as to the value of Renzi's lost income and the value of her services, under the assumption that Renzi's normal life expectancy was eighty-two years and four months, that she would have retired from public school teaching at age sixty-one, and that (based on representations from her husband) she would have taught in a private school until age sixty-five. McCausland derived a net present value of economic loss from Renzi's premature death of $1,019,936.

Prior to the verdict, Veatch settled the plaintiff's case against her for $1.5 million. On special questions, the jury found Veatch not negligent in her treatment of Renzi in June, 1994, but negligent in her treatment in December, 1994 through January, 1995. They found that the negligence was not "a substantial contributing factor in causing" Renzi's death but that it was a "substantial contributing factor in causing [Renzi] the loss of a substantial chance to survive."

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[9] This amount is the sum of $1,298,431 for the present value of Renzi's lost earning capacity from her public school employment ($386,030), the present value of Renzi's lost earning capacity from her private school employment ($147,405), the present value of lost private school fringe benefits ($29,127), the present value of net lost public retirement pension benefits ($365,418), and the present value of lost imputed earning capacity ($370,451), minus $ 278,495, for the discounted present value of the money Renzi would have spent for her own consumption.

[10] In Matsuyama, supra at n.47, we noted the criticism of the "substantial contributing factor" language in loss of

The jury found Paredes negligent in his reading and reporting of Renzi's 1995 mammogram. They found that Paredes's negligence was not "a substantial contributing factor in causing" Renzi's death, but that it was a "substantial contributing factor in causing [Renzi] the loss of a substantial chance to survive." Because neither defendant's negligence was found to have caused Renzi's death, no wrongful death damages were awarded. The jury awarded other damages in response to special verdict questions, which we discuss in detail below. We conclude that a new trial is required on the issue of damages because of errors in the special verdict questions and the judge's instructions.

The judge ruled that Paredes and Associated Radiologists (together, the defendants) were jointly and severally liable for all damages and entered judgment against them in the total amount of $2.8 million, plus interests and costs, with Veatch's settlement amount credited against the judgment. Posttrial motions for judgment notwithstanding the verdict and a new trial were denied. We granted the defendants' joint application for direct appellate review. We now turn to the merits.

2. Loss of chance. In Matsuyama, supra at , we recognized loss of chance as a theory of injury in a medical

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the "substantial contributing factor" language in loss of chance claims involving only one cause. Such criticism has no bearing here, where there are two alleged tortfeasors.

[11] See discussion of joint and several liability, part 4.c, infra.

malpractice wrongful death action where the patient's chance of survival immediately preceding the malpractice was less than 50%. To the extent that Matsuyama anticipates and responds to the defendants' objections to the recognition of the loss of chance doctrine in Massachusetts, we respond by reference to the earlier case. To the extent that the defendants here appear to be arguing that loss of chance recovery is inappropriate any time the patient's prenegligence chance of survival is better than even, and drops to less than even as a result of the negligence, we conclude that such a rule would be arbitrary and inappropriate in light of the contemporary realities of medical practice. See id. at . As we noted in Matsuyama, regardless whether the patient's prenegligence chance of survival was 51% or 49%, if the physician's breach of duty destroyed or diminished that chance, as established by credible expert testimony, then the physician has deprived the patient of something of value for which

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[12] The defendants in this case argue that the loss of chance doctrine is not recognized in Massachusetts, is a matter solely for the Legislature to enact, is incompatible with our wrongful death statutes, G. L. c. 229, §§ 2 and 6, would radically alter established law, creates a new category of legal harm that is "metaphysical, speculative and inchoate," and will vastly increase the "theoretical and practical complexities" of medical malpractice trials, all issues addressed in Matsuyama, supra at .

[13] It has been suggested that the correct term for loss of chance of survival where the prenegligence chance of survival was more than 50% is "loss of a likelihood of survival." See, e.g., J. Lockhart, Cause of Action for Medical Malpractice Based on Loss of Chance of Cure, 4 Causes of Action 2d § 1 (2007). We view the distinction as unnecessarily technical and do not employ it.

compensation is required. Id. at . "Where credible evidence establishes that the plaintiff or decedent's probability of survival is 49%, that conclusion is no more speculative than a conclusion, based on similarly credible evidence, that the probability of survival is 51%." Id. at . It would defy logic, to say nothing of fairness, to absolve a physician from liability when his or her malpractice reduces a plaintiff's chances of survival from greater than even to less than even.

The defendants claim that loss of chance damages are "unsupportable" where the jury otherwise found no wrongful death. In Matsuyama, we held that "claims for loss of chance of survival are sufficiently akin to wrongful death claims as to be cognizable under the wrongful death statute, which governs the procedural requisites for such claims." Id. at . Nonetheless, the claim that a defendant caused the decedent's death is not the same as the claim that the defendant caused her a loss of chance to survive. The two theories of injury are distinct. They entail different damages calculations. Where the evidence could support either a theory that the defendant's conduct caused the decedent's death (making full wrongful death damages appropriate) or a theory that the defendant's conduct caused the decedent a loss of chance of survival (making proportional damages appropriate), the judge should make it clear to the jury that only one kind of damages or the other may be awarded. A jury may find the defendant liable either for causing the patient's wrongful death, or for causing the patient's loss

of a chance to survive, but not for both.

3. Jury instructions. The defendants argue that the damages awarded by the jury cannot stand because they are the product of jury instructions and special verdict questions that, over the defendants' repeated objections, failed to employ the proportionate method of damages for loss of chance of survival. Because we agree with the defendants that the judge's instructions and the special verdict questions conflated loss of chance damages with the damages available in a standard wrongful death case, a new trial limited to the issue of damages is required.

In Matsuyama, supra at , we concluded that the proportional method was the appropriate method to determine loss of chance damages, and we laid out the following calculations for determining damages:

> "(1) The fact finder must first calculate the total amount of damages allowable for the death under the wrongful death statute, G. L. c. 229, § 2, or, in the case of medical malpractice not resulting in death, the full amount of damages allowable for the injury. This is the amount to which the decedent would be entitled if the case were not a loss of chance case: the full amount of compensation for the decedent's death or injury [emphasis in original].
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> "(2) The fact finder must next calculate the patient's chance of survival or cure immediately preceding ('but for') the medical malpractice.

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[14] We reject the defendants' contention that insufficient evidence supported the jury's finding of liability. The testimony of Adler and Glick alone, if believed by the jury, would have furnished adequate grounds for such a finding. See, e.g., Leibovich v. Antonellis, 410 Mass. 568, 573 (1991) (soundness and credibility of expert testimony is for jury to decide).

> "(3) The fact finder must then calculate the chance of survival or cure that the patient had as a result of the medical malpractice.
>
> "(4) The fact finder must then subtract the amount derived in step 3 from the amount derived in step 2.
>
> "(5) The fact finder must then multiply the amount determined in step 1 by the percentage calculated in step 4 to derive the proportional damages award for loss of chance."

In their trial briefs, proposed jury instructions, and objections to jury instructions, the defendants took the position that, should the judge allow a claim for loss of chance to go forward, the jury instructions and special verdict questions should reflect the "apportionment method" of calculating damages, in order to avoid making the defendants liable for damages for the ultimate injury, Renzi's death. The judge declined these requests. Rather, in his instructions to the jury on damages, he stated, "You will only reach the issue of damages if you find that either or both of the Defendants were negligent and <u>that their negligence was a proximate cause of the decedent's death</u>" (emphasis added). The judge then essentially stated the elements of damages provided by the wrongful death statute, G. L. c. 229, § 2 ("the fair monetary value of the decedent to the persons entitled to receive the damages recovered . . . including but not limited to compensation for the loss of the reasonably expected

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[15] Although this instruction would appear to preclude loss of chance damages, the instructions on causation and the special verdict form indicate that the judge did contemplate loss of chance damages.

net income, services, protection, care, assistance, society, companionship, comfort, guidance, counsel, and advice of the decedent"). The judge offered no specific instructions on how to calculate the portion of these damages that should be awarded if the jury were to find, as they ultimately did find, that the defendants' negligence did not cause Renzi's death, but did cause her a loss of chance of survival. In further specific instructions on loss of consortium, conscious pain and suffering, and the calculation of net income, the judge did not make a distinction between the damages to be awarded for loss of chance of survival and those to be awarded for ordinary wrongful death. In summary, the instructions on damages conflated ordinary wrongful death and loss of chance of survival as theories of injury, and failed to give the jury any guidance on how to calculate damages for loss of chance of survival. This failure may have led the jury to confuse the two theories of injury.

The judge's error was compounded by the special verdict questions, which were duplicative in certain respects and did not adequately distinguish between traditional wrongful death damages and loss of chance of survival damages. After a series of questions on negligence and causation that carefully distinguished between "causing . . . Renzi's death" and "causing" Renzi "the loss of a . . . chance to survive," the special

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[16] The judge's instructions on causation, on the other hand, were carefully crafted to distinguish the two forms of harm.

verdict questions on damages included a section on [ordinary] "Wrongful Death Damages," a section on "Conscious Pain and Suffering Questions," and a section on "Loss of Chance of Survival Claims," followed by a separate section titled "Loss of Consortium" that included a final question, "What are the total economic damages suffered by the Estate of Mary Jane Renzi as a result of the loss of a substantial chance of survival?" While

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[17] During deliberations, the jurors indicated by note to the judge that they were confused about whether questions 10 through 15 (labeled "Wrongful Death Damages" and "Conscious Pain and Suffering Questions") were to be answered if the jury found that the defendants' negligence did not cause Renzi's death, but did cause her a loss of chance of survival. After conferring with counsel, the judge instructed the jury that if those were the findings as to liability, they should skip the "Wrongful Death Damages" questions, but should answer the "Conscious Pain and Suffering Questions" and all remaining questions, which the jury did.

[18] The jury awarded the estate $150,000 for Renzi's conscious pain and suffering, which the judge had instructed should include "any additional treatments she would not have otherwise had to undergo, emotional anguish, apprehension, and fear suffered while alive, as a result of the delay in diagnosis of her breast cancer," as well as "mental pain and suffering . . . due to a delay in diagnosis" that was caused by the defendants' negligence. The jury apportioned 80% of this liability to Veatch and 20% to Paredes. See part 4.c, infra.

[19] The jury awarded the plaintiff $500,000 against Veatch, and $100,000 against Paredes, for "the value of the reduction of [Renzi's] chance of survival."

[20] The jury awarded $650,000 for loss of consortium, apportioning 80% of the liability to Veatch and 20% to Paredes.

[21] The jury answered the question concerning "the total economic damages" as a result of "the loss of a substantial chance of survival" with a figure of $1.4 million. Our remand on the issue of damages makes it unnecessary for us to decide whether, as the defendants urge, the judge improperly doubled the amount the jury intended to award to the plaintiff because the $1.4 million figure on the special verdict form for "total

the judge correctly provided separate questions addressing ordinary wrongful death damages and loss of chance of survival damages, and correctly instructed the jury to answer only one or the other, the additional questions regarding loss of consortium and "total economic damages" were unnecessary and duplicative: these items should already have been accounted for as part of either the ordinary wrongful death damages or the loss of chance of survival damages.

Moreover, nothing on the special verdict forms indicated that, if the jury awarded damages for loss of a chance, those damages should be calculated according to the proportional damages approach. The jury awarded "total economic damages" of $1.4 million, a sum notably in excess of the figure of $1,019,936 derived by the plaintiff's forensic economist as the net economic value of Renzi's full wrongful death damages. The plaintiff correctly points out that a jury are not required to accept any part of an expert's testimony, even where uncontradicted. See, e.g., Charrier v. Charrier, 416 Mass. 105, 112 (1993). Here,

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economic damages" was not a separate award but rather appears to represent the jury's tally of the separate sums awarded for conscious pain and suffering ($150,000), loss of chance of survival ($600,000) and loss of consortium ($650,000), in the preceding questions.

[22] The judge was correct to include a separate question on conscious pain and suffering caused by the defendants' negligence. See note 19, supra. Such pain and suffering is not part of the loss of chance proportional damages calculus. See Matsuyama, supra at n.42.

[23] See note 21, supra.

however, because the jury were not properly focused on the correct method of calculating damages, and the jury instructions and special verdict questions were both incorrect and confusing on the issue, we are confronted with the strong possibility that the jury employed a method other than the proportional method to their findings on damages, and in a manner that overcompensated the plaintiff. Reversal on the issue of damages is thus required. See Ayash v. Dana-Farber Cancer Inst., 443 Mass. 367, 392-393, cert. denied sub nom. Globe Newspaper Co. v. Ayash, 546 U.S. 927 (2005) (remanding for new trial on damages where judge's instructions and undifferentiated damages award made it impossible to ascertain what damages were awarded for which claim).

4. Other matters. Although we are remanding on the limited issue of damages, the remaining issues raised by the defendants must be addressed here.

a. Digital photographs. First, an issue throughout the pretrial, trial, and posttrial phases of this litigation was the question whether the judge erred in rulings and jury instructions concerning digital images of Renzi's mammograms. To resolve this question, some background is necessary.

During direct examination of Adler, an expert for the plaintiff, the plaintiff, over defense counsel's objections, sought and obtained admission in evidence of digital images of Paredes's mammography films that had been scanned into a computer, shown at trial as a "PowerPoint" presentation, and

included in hard copy reproduction in the juror notebooks. Prior to Adler's use of the photographs at trial, on voir dire, she testified, among other things, that the original X-rays, and not the digital reproductions, formed the basis of her expert opinion; that the digital photographs were made by her staff and at her direction specifically for use at trial; that the images were substantial likenesses of the originals and not artificially enhanced; and that they were of the type and quality that she routinely used for scientific presentations. The judge pronounced himself satisfied that the images were substantial likenesses of the originals, and noted that defense counsel would have opportunity to cross-examine the expert about their reliability.

On cross-examination, Adler insisted that the digital images were the "substantial equivalent" of the originals, but also stated that they showed a "substantial difference," a "more startling" difference in the amount of white visible. The use of the photographs and Adler's testimony provoked a motion from the defendants "for judicial response to plaintiff's fraudulent conduct," and a response from the plaintiff's counsel that included an affidavit by the out-of-State technician who created the images and the PowerPoint presentation about his methods for

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[24] We will not venture into the parties' conflicting views on whether or when the photographs were first shown to defense. It is enough to repeat the judge's admonition that all counsel had an obligation to address such matters before trial.

doing so. The defendants' motion was denied on the grounds that the defendants failed to show that the photographs were a distortion or anything other than a substantial likeness of the originals and that the defendants were not prejudiced by their introduction.

The matter did not end there. On the judge's order, at trial Adler handed over to defense from her briefcase a compact disc (CD) of the digital images, marked as exhibit "C" for identification. The defense subsequently attempted to call its own expert technical witness, who was subject to voir dire examination. The witness testified on voir dire that the process of creating the digital images shown to the jury "alter[ed] or manipulat[ed]" the contrast in the original. However, it was discovered during his testimony that the CD provided to defense counsel was not the same CD used at trial. At that point, the judge pronounced himself satisfied that Adler had based her opinion on an examination of the original mammogram X-rays, that the digital photographs shown to the jury were substantial likenesses of the originals, and that "[t]o the extent [the digital images] are somewhat different" from the originals, it was "obvious[]" they were "being used in a demonstrative purpose." The defense did not request to see the CD of

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[25] The judge stated, "The fact of the matter is the Court was here and I saw the light coming in from the two big windows off to our left, the screen was some forty feet away from the jury box, obviously it was being used in a demonstrative purpose."

photographs submitted to the jury and did not object at the end of the voir dire. The judge did not permit the defense expert to testify. At the close of evidence, the judge gave a limiting instruction on the use of the digital images.

The essence of the defendants' argument here is that admission of the photographs violated the best evidence rule, was done without proper foundation, and otherwise was highly misleading and prejudicial to their defense. We do not agree.

The use of demonstrative aids, including digital photographs and computer-generated images, is now commonplace in our courts. See generally 2 McCormick, Evidence § 214 (6th ed. 2006). A judge has broad discretion in the admission of such evidence. See Commonwealth v. Noxon, 319 Mass. 495, 536 (1946) (admission of photographs largely in discretion of trial judge). Authentication is a preliminary question of fact for the judge to decide. Id. at 537. The person testifying as to the substantial similarity of the photograph and the original need not be the photographer but may be a person familiar with the details

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[26] In full, the instruction stated: "The original mammogram films are in evidence. You will have them with you in your jury room during deliberations. In addition to the original mammograms, photographs have been placed in evidence and you were shown several screen projections of those mammograms. The photographs and screen projections are not a substitute for the originals, but were allowed [in] evidence to assist you in viewing and comparing the mammograms in question. The Court ruled that they were admissible as substantial likenesses of the originals. You will have the originals and the view boxes with you in the jury room. Although this Court ruled they were admissible, it is up to you to determine their usefulness to you and what weight, in any, you attribute to them."

pictured. See Commonwealth v. Weichell, 390 Mass. 62, 77 (1983), cert. denied, 465 U.S. 1032 (1984) ("the best evidence rule does not apply to photographs"). See generally H.J. Alperin & L.D. Shubow, Summary of Basic Law § 10.151 (4th ed. 2007). When, as here, the demonstrative photograph is generated as a digital image or video image, the judge must determine whether the image fairly and accurately presents what it purports to be, whether it is relevant, and whether its probative value outweighs any prejudice to the other party. See, e.g., Commonwealth v. Leneski, 66 Mass. App. Ct. 291, 294 (2006), quoting Commonwealth v. Harvey, 397 Mass. 351, 359 (1986), and Commonwealth v. Mahoney, 400 Mass. 524, 527 (1987) ("videotapes are 'on balance, a reliable evidentiary resource,' . . . and . . . 'should be admissible as evidence if they are relevant [and] provide a fair representation of that which they purport to depict' . . . digital images placed and stored in a computer hard drive and transferred to a compact disc are subject to the same rules of evidence as videotapes"). See also 2 McCormick, supra (enhanced images within category of demonstrative aids so long as they accurately illustrate what witness has to say). Concerns regarding the completeness or production of the image go to its weight and not its admissibility. See Commonwealth v. Leneski, supra at 295-296.

Here, the judge was plainly within the scope of his discretion to rule that Adler's authentication of the digital photographs was sufficient. He was also on sound footing in

ruling that the evidence was admissible for demonstrative purposes. The judge could reasonably assume that the photographs would assist the jury in viewing and understanding the original mammogram X-rays, which were beyond their ability to interpret. He dispelled any possible prejudice to the defendants by giving them wide berth to cross-examine Adler on the photographs, and providing a limiting instruction that would have made it clear to a reasonable juror that the images were merely illustrative, not exact replicas, and no substitute for the originals (which formed the basis of Adler's expert opinion on negligence). His comment on finding the photographs to be "substantial likenesses of the originals" was not, as the defendants claim, an "imprimatur" to give the photographs substantial weight but a statement of the status of the evidence made necessary by the defendants' innuendos of trickery on the part of the plaintiff. There was no error.

b. Paredes's estate. There is no merit in the defendants' assertion that the judge committed reversible error by instructing the jury that "[b]y statutory provisions of probate law in Massachusetts the estate of Dr. Paredes is not responsible for any award of damages that you should consider and you should not consider that issue." The judge made it quite clear in his memorandum of decision on the defendants' motion for judgment notwithstanding the verdict or for a new trial that the instruction "was necessary in this instance given the frequent references to the fact of Dr. Paredes' death and in order to

ensure that the jury would correctly base any decision concerning Dr. Paredes' liability on the evidence." It is well within his discretion to provide such curative instruction.

c. Apportionment. The defendants contend that the judge erred in rejecting the jury's apportionment of damages and holding Veatch and Paredes jointly and severally liable for damages. We do not agree. The special verdict questions permitted the jury to apportion damages, if any, between the physicians for conscious pain and suffering and for loss of consortium. However, as the judge stated in his memorandum of decision and order, he "included a special jury question for apportionment of damages in the sole event that the jury found Dr. Veatch negligent during the June 1994 time period" (emphasis in original). The jury found Veatch not liable for negligence in her treatment of Renzi in June, 1994. They found both Veatch and Paredes negligent in their treatment of Renzi during the period from December, 1994, through January, 1995, when Veatch saw Renzi

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[27] According to the judge's statements in his memorandum of decision and order on the judgment and in his memorandum of decision denying the defendants' motion for judgment notwithstanding the verdict, the instruction on apportionment was requested by Paredes's counsel, the judge worked "extensively" with the parties' counsel to formulate the special verdict questions, and as a result of his work with counsel, the special verdict question on apportionment was included "in the sole event that the jury found Dr. Veatch negligent during the June 1994 time period." The defendants do not refute these statements.

The jury were not specifically instructed that they were to answer the apportionment questions only if they found Veatch liable in June, 1994; they did in fact answer two questions apportioning damages. See notes 18 and 20, supra.

three times and Paredes read her mammogram.

The judge's instructions on shared liability were correct. See O'Connor v. Raymark Indus., Inc., 401 Mass. 586, 591 (1988), quoting Chase v. Roy, 363 Mass. 402, 408, (1973) ("if two or more wrongdoers negligently contribute to the personal injury of another by their several acts, which operate concurrently, so that in effect the damages suffered are rendered inseparable, they are jointly and severally liable"). Considering these instructions, the evidence that each physician negligently failed to provide the other with important information about Renzi that might have led to an earlier diagnosis, and the jury's findings that the physicians' negligence occurred close in time, because Veatch was not negligent in June, 1994, we conclude that the judge did not err in holding the defendants jointly and severally liable.[28]

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[28] Additionally, the judge did not, as the defendants claim, err in instructing the jury to "disregard" any testimony as to the biology or genetics of breast cancer. He did instruct the jury that if an expert offered an opinion on Renzi's cancer based on genetic or biological studies or investigation for which there was no evidence, "you should evaluate the witness's credibility and opinion on only that which was done and not surmise or conjecture." The instruction is proper in its own right. It was particularly so in this case because Stone, testifying for the defense over the plaintiff's objection, asserted that Renzi's breast cancer was of a biological and genetic origin that made it almost invariably fatal. However, in answer to a question posed by the judge, Stone admitted that in 1995 and 1996, medical science did not have the capability to do genetic studies of breast tissue for the diagnosis and staging of cancer. He also testified that to his knowledge no such studies had been done on Renzi and that taking the biology of a tumor was not the state of the art in the relevant time frame. During the trial, the judge told the defendants' counsel that they had not laid any foundation for the admission of testimony about the genetic or

5. Conclusion. For the reasons stated herein, judgment is affirmed as to all matters except the amount of damages, as to which judgment is vacated. The case is remanded for determination of the amount of damages consistent with this opinion. On remand, the judge, in consultation with the parties, may consider whether to proceed by empanelling a jury, by hearing the matter jury waived, or by other procedure. See Ayash v. Dana-Farber Cancer Inst., 443 Mass. 367, 392-393 (2005).

So ordered.

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biological component of Renzi's cancer, and the defendants did not cure the insufficiency. There was no error.

[29] The judge's instructions and special verdict form refer to "the loss of a substantial chance to survive" (emphasis added). We have not imposed a requirement that plaintiffs must demonstrate a "substantial" loss of chance, see Matsuyama, supra at n.58. Here, imposing this higher burden on the plaintiff did not prejudice the defendants.