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NCN: [2023] EWHC 2719 (KB)

IN THE HIGH COURT OF JUSTICE
KING'S BENCH DIVISION

No. QB-2020-003622

Royal Courts of Justice
Strand
London, WC2A 2LL

Tuesday 25 July 2023

Before:

MR DEXTER DIAS KC
(Sitting as a Deputy Judge of the High Court)

B E T W E E N :

KJY
(by his Mother and Litigation Friend, LMD)

Claimant

- and -

UNIVERSITY COLLEGE HOSPITAL
NHS FOUNDATION TRUST

Defendant

[REPORTING RESTRICTIONS / ANONYMISATION APPLIES]

MR M COATES-WALKER (instructed by Fieldfisher LLP) appeared on behalf of the Claimant for judgment; MR J DUFFY appeared at trial.

MS F MAULADAD KC (instructed by Hempsons) appeared on behalf of the Defendant.

Hearing dates: 22, 23, 24 June 2023
Written submissions close 14 July 2023

<u>J U D G M E N T</u>

DEXTER DIAS KC:
(sitting as a Deputy High Court Judge)

1 This is the judgment of the court.

2 It is divided into seven sections to assist the parties and the public to follow the court's line of reasoning:

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§I. Introduction

3 On 14 October 2010, the claimant in this case was born by Caesarean section at University College London Hospital. At birth, his umbilical cord was wrapped around his neck and stomach. He was taken to the neonatal care ward and placed in an incubator. When he was one day old the claimant underwent several abdominal x-rays, because of a suspicion that there may have been some malrotation causing choking episodes and problems with swallowing.

4 This claim is brought on behalf of that new-born, now a 12 year-old boy. He lives with bilateral development dysplasia of the hips ("DDH"). The prime question before the court is whether that hip abnormality should have been spotted right at the start of his life. It was not.

5 I have found that anonymisation is necessary to protect the right to respect for the private life of this child and his family under Article 8 of the European Convention of Human Rights. Therefore, he will be known as "KJY". He brings the claim through his mother and litigation friend "LMD".

6 The claimant was represented by Mr Duffy of counsel at trial, but today Mr Coates-Walker of counsel is here to take the judgment in his place. The defendant is the University College London Hospital NHS Foundation Trust. This Trust operated the hospital and was responsible for the doctors working there. It has been represented throughout by Ms Mauladad KC. The court is particularly grateful to all counsel for their first-class assistance in this case.

7 This claimant's clinical negligence claim arises out of the examination of three x-rays taken of him on 15 and 16 October 2010, just after his birth, and the question is whether abnormalities in alignment around his legs and hips should have been identified by all reasonable and competent radiologists. The DDH that the claimant lives with is a serious condition and can have lifelong and life-changing consequences. While anatomically the

hip is a complex structure it works relatively simply. The connection between the leg and the hip is a little like a ball and socket. The top of the upper leg bone is known as the "femoral head", and that acts like a ball, made up of cartilage and gristle.

8 A structure in the hip called the acetabulum acts as the socket. It is also made both of bone and cartilage. If the curvature of the acetabulum is incorrect the femur's top - the ball - may not fit properly into it, or it may become less tight. This is called subluxation. In more severe cases the femur may be so out of position that it is out of the joint and this is called dislocation.

9 There were two doctors who viewed the x-ray images of the claimant at the hospital. They were Dr Boavida and Dr Steward. The claimant was so new to the world that he did not even qualify in strict medical terms as a baby and was thus called a "neonate". He was being examined for medical issues completely unrelated to his hips, being referred for x-rays as he was experiencing choking episodes and was not able to tolerate his feeds. Thus x-rays were ordered by his treating clinician. It was Drs Boavida and Steward who reviewed them.

10 The images were all abdominal x-rays. The timings are significant. The first was taken at 11.29 on 15 October 2010; that is reported by Dr Boavida. The second at 15.33 on 15 October, reported by Dr Steward. The third at 10.41 on 16 October 2010, reported again by Dr Steward.

11 The doctors identified no abnormalities of the hip. DDH was ultimately diagnosed on 20 December 2011 by a consultant orthopaedic surgeon, Professor Roposch (as he is now - he was then Mr Roposch). At that point the claimant was 14 months old.

12 The parties in this case cannot agree whether Dr Boavida and Dr Steward were negligent, that is in breach of their duty of care for the claimant, so expert radiologists have been instructed by both sides. They are Dr Caren Landes for the claimant and Dr Ashok Raghavan for the defendant. They agreed that the radiographs that were obtained on 15 and 16 October 2010 showed malalignment of the hips. But they disagree as to whether the reporting radiologists should have identified that abnormality.

13 The claimant's case is that the reporting radiologists both failed to identify the abnormality in this new-born’s hips that should have been identified. This is notwithstanding that the imaging request by the clinicians treating the claimant related to other issues, such as choking. But the claimant's case is that does not matter as there is a duty to review the whole image, to examine each part of the image with equal care and diligence, and to report any abnormality or any possible abnormality.

14 The defendant's case is based on Dr Raghavan's opinion. He would not expect the reporting radiologists to have identified the abnormality at the time of the reporting. That is because the findings are too “subtle”. The findings are only evident in retrospect with the knowledge that the claimant suffered child hip dysplasia.

15 This matter was listed for a three-day trial of the breach of duty dispute. It was due to start on 22 June 2023. The materials in front of the court included an electronic bundle extending to 593 pages, medical records subdivided into seven bundles exceeding 1,000 pages, annotated x-rays, an authorities bundle with six authorities coming to 110 pages, and a research journal article. I heard live evidence from both radiologists and from the two

experts. The court received both opening and closing written skeleton arguments from counsel. That is how this case came before me between 22 and 24 June 2023, and this judgment is the result.

16 However, let me be clear about my approach to the evidence for the purposes of this judgment. It is heavily informed by the approach of the Court of Appeal in *Re B (A Child) (Adequacy of Reasons)* [2022] EWCA Civ. 407. The court stated at para.58:

> "(4) ... a judgment is not a summing-up in which every possible relevant piece of evidence must be mentioned."

Therefore, I focus on what has been essential to my determinations in this case. However, I emphasise that as part of my review - and this judgment has been reserved - I have considered it all. The vital question on which everything turns is whether the failure of the reporting radiologists to have identified the agreed abnormalities in the scans on 15 and 16 October 2010 fell below the acceptable professional standard. Were the abnormalities sufficiently clear such that all reasonable and responsible radiologists would have identified them? Put another way: would no reasonable and responsible radiologist have failed to have spotted that the claimant might have had a hip abnormality?

§II. Agreed Facts and Common Ground

17 I note that there is a good deal of common ground and for ease of comprehension I reduce it to a number of points and propositions. Once these essentials are grasped, the rest of the evidence will have a solid context. They come to 29 in total:

(1) The court is only tasked with the question of breach of duty in respect of the x-rays; that is radiology (see Concession Footnote 1 of the claimant's closing skeleton).
(2) The referral for the x-rays was for clinical questions unconnected with hip dysplasia.
(3) There were three images in total.
(4) The images were of good quality as Dr Steward said in evidence. There is no suggestion to the contrary.
(5) The images were examined as follows:
- **The image at 11.29** on 15 October 2010 was reviewed four times; once by Dr Boavida on 15 October; and three times by Dr Steward when he was reviewing the 15.33 image on 15 October, when he reviewed the 10.41 image on 16 October, and again when he reviewed all three images on 18 October.
- **The 15.33 image** was reviewed three times by Dr Steward on 15, 16 and 18 October.
- **The 10.41 image** from 16 October was reviewed twice by Dr Steward on 16 October and 18 October.

(6) There is no evidence from Great Ormond Street Hospital that anybody at that other hospital reviewed the images. In his evidence Dr Steward says about Great Ormond Street that they "will have reviewed the images", and he added, "that is how it works". Dr Landes stated that Great Ormond Street were looking at the images to see if it is safe to do a contrast study, because on 18 October the claimant was transferred to Great Ormond Street for further tests. These included a contrast scan. The radiologists at Great Ormond Street might not have even looked at the hips, she says. It is speculative and cannot provide reliable evidence that these images were

examined by Great Ormond Street Hospital. There is no evidence from the hospital that they were.
(7) All the images show abnormal hip alignment.
(8) Both Dr Steward and Dr Boavida, at the relevant time of the examinations, knew and understood the indicative signs of DDH.
(9) The three images have been annotated by Dr Landes to show where the proper alignment of the proximal femur should be.
(10) Dr Landes' annotations are accepted as accurate by Dr Raghavan.
(11) The images would typically have taken between five to ten minutes to examine.
(12) The radiologists were not obliged to draw lines through the centre of the femur to measure the acetabular angles or to trace around the femur to establish its position.
(13) Radiologists are trained in the use of the PACS medical software and information system.
(14) Radiologists could have used the PACS system to establish any of the above details, or to zoom in to any part of the image.
(15) X-rays are not the preferred method used to diagnose hip dysplasia in neonates.
(16) X-rays can reveal hip abnormalities.
(17) DDH is a serious condition with potentially life changing consequences.
(18) All reasonable and responsible radiologists would know that DDH is present as a risk for the neonatal population.
(19) The prevalence of DDH among neonates is about 1 per cent of the population, very approximately, with a higher incidence amongst female new-borns.
(20) A reasonable, responsible radiologist would know the chief anatomical indications of DDH.
(21) Both witnesses had, at the material time, been responsible for reviewing ultrasound scans for evidence of hip dysplasia. For example, Dr Boavida was able to recall how prominent DDH was in the practice of paediatric radiologists. He estimated - and I will come to it - that DDH was "likely to be in the top five conditions" they would look for in using ultrasound.
(22) The femoral capital epiphysis, that is the femoral head, is invisible in neonatal x-rays.
(23) The femoral head sits on top of the proximal femur.
(24) There was no evidence that the claimant's femur is of unusual or atypical size.
(25) Mr Roposch, a consultant orthopaedic surgeon, ultimately diagnosed the claimant's DDH on the basis of x-ray in part.
(26) A radiologist has to review the entirety of the image.
(27) A radiologist must review all of the image professionally, diligently and with equal care.
(28) A radiologist must record any identified abnormality or any identified possible abnormality.
(29) Both radiologists were experienced registrars in the fifth year of their medical practice and both on the cusp of being made consultants.

§III. Legal Principles

18 The law in this case is uncontroversial and has been agreed between the parties.

19 The burden of proof in establishing negligence lies on the claimant: *Ternent v Ashford & St Peter's Hopital NHS Trust* [2010] EWHC 593.

20 The classic statement for the standard of care required of a medical professional is McNair J's direction to the jury in *Bolam v Friern HMC* [1957] 1 WLR 582 :

> "[The doctor] is not guilty of negligence if he has acted in accordance with a practice accepted as proper by a responsible body of medical men skilled in that particular art…Putting it the other way round, a man is not negligent if he is acting in accordance with such a practice, merely because there is a body of opinion who would take a contrary view."

21 The *Bolam* test does not allow a defendant to avoid liability simply by producing evidence that a respectable minority of practitioners would have acted similarly. In *Bolitho v City and Hackney HA* [1998] AC 232 Lord Browne-Wilkinson introduced the well-known caveat to the *Bolam* test that the *"respectable minority practice"* must have a sound and logical basis:

> "The court has to be satisfied that the exponents of the body of opinion relied upon can demonstrate that such opinion has a logical basis. In particular, in cases involving, as they so often do, the weighing of risks against benefits, the judge before accepting a body of opinion as being responsible, reasonable or respectable, will need to be satisfied that, in forming their views, d their minds to the question of comparative risks and benefits and have reached a defensible conclusion on the matter."

22 *Bolam* and other appellate decisions endorsing that test have been concerned with what can be called "treatment cases" - cases where a doctor recommends or undertakes treatment or further diagnostic procedures. In such cases, there are often choices and options available and risks and benefits that need to be considered. However, it has been recognised that in some areas of medical practice, such as radiology or histopathology, there should be limited scope for any genuine difference of opinion. A diagnosis based upon a scan is usually either right or wrong. In these "pure diagnosis" cases, there is no weighing of risks against benefits, and no decision to treat or not to treat, just a diagnostic or pre-diagnostic decision, which is either right or wrong, and either negligent or not negligent.

23 The issue has been the subject of Court of Appeal authority. In *Penney v East Kent HA* [2000] Lloyds Rep Med 41, four cervical smears taken from three claimants between 1989 and 1992 were reported by primary cyto-screeners as negative (i.e., no abnormal cells seen). Unfortunately, each claimant went on to develop invasive adenocarcinoma of the cervix requiring radical surgery. Early detection would have resulted in minor surgery only. The claimants contended that each smear slide exhibited abnormalities which no reasonably competent primary cyto-screener could, with confidence, treat as negative.

24 The decision of the judge at first instance was based on his view that the *Bolam* test would only apply where there were differing views as to what constituted acceptable professional practice. Because the experts agreed that the cyto-screeners were wrong in the way that they had interpreted the slides, no question of acceptable practice arose. On the judge's primary reasoning any misdiagnosis or misreporting was ipso facto fundamentally inconsistent with acceptable professional practice. In the alternative to that basis for his decision, the judge applied the *Bolam* test and still found against the defendant.

25 Counsel and the Court of Appeal in *Penney* accepted that *Bolam* and *Bolitho* applied, thereby avoiding an analysis of the judge's primary reasoning. Lord Woolf MR, delivering the Judgment of the whole Court (May and Hale LJJ), concluded:

> 26. …The screeners were exercising skill and judgment in determining what report they should make and in that respect the *Bolam* test was generally applicable. Later authorities make clear that this is the appropriate standard to apply. However, as we will explain, the fact that two sets of competent experts genuinely hold differing opinions as to whether or not at the relevant date, which is the date of the examination, the screeners could without being negligent have diagnosed smears as negative does not necessarily provide the solution to the dispute on liability in these cases.
>
> 27. There is the qualification which Lord Browne-Wilkinson identified in the passage already cited from his opinion in Bolitho. In addition the Bolam test has no application where what the judge is required to do is to make findings of fact. This is so, even where those findings of fact are the subject of conflicting expert evidence. Thus in this case there were three questions which the judge had to answer:
>
> 1. What was to be seen on the slides?
> 2. At the relevant time could a screener exercising reasonable care fail to see what was on the slide?
> 3. Could a reasonably competent screener, aware of what a screener exercising reasonable care would observe on the slide, treat the slide as negative?
>
> 28. Thus, logically the starting point for the experts' reasoning was what was on the slides. Except in relation to the slide known as Palmer 2, as to which there was a striking conflict, as a result of a meeting which took place between the experts they were in substantial but by no means total agreement. In so far as they were not in agreement, the judge had the unenviable task of deciding as a matter of fact which of the experts were correct as to what the slides showed. This was a task which required expert evidence. However the evidence having been given, the judge had to make his own finding on the balance of probabilities on this issue of fact in order to proceed to the next step in answering the question of negligence or no negligence. Having come to his own conclusion as to what the slides showed, the judge had, therefore, then to answer the 2nd and 3rd questions in order to decide whether the screener was in breach of duty in giving a negative report. Whether the screener was in breach of duty would depend on the training and the amount of knowledge a screener should have had in order to properly perform his or her task at that time and how easy it was to discern what the judge had found was on the slide. These issues involved both questions of fact and questions of opinion as to the standards of care which the screeners should have exercised. As already indicated, there was virtually no evidence of the actual training provided to the primary screeners. The approach of the experts was to give their opinion, based on their respective interpretations of what was on the slide, on the general question of whether a reasonably competent screener, exercising the appropriate standard of care, could treat the slide as negative."

26 *Penney* was considered in detail in the judgment of Kerr J in *Muller v Kings College Hospital NHS Foundation Trust* [2017] EWHC 218. Kerr J's reluctance to accept the law as stated in *Penney* , can clearly be seen in the following passages:

> “72. Unfortunately, the Court of Appeal did not expressly endorse the judge's proposition that the Bolam principle did not apply because there was no issue of

whether a particular course of conduct was acceptable medical practice. However, the Court of Appeal did allow a liberal invocation of Lord Browne- Wilkinson's Bolitho exception, no doubt because this was, in Lord Browne-Wilkinson's words, not a case where there was any "weighing of risks and benefits", which should attract particular deference to the views of the experts, whether or not unanimous.

73. I have had to review that case law in some detail in order to draw from it, with some regret, the conclusion that even in a pure diagnosis case such as this, the exercise of preferring one expert to another must be viewed through the prism of the Bolitho exception, rather than, as would be preferable, by rejecting the very notion that the Bolam principle can apply where no " Bolam -appropriate" issue arises. I respectfully agree with Judge Peppitt QC that the latter turn to my starting point: that McNair J did not have a pure diagnosis case such as this in mind when he gave his direction to the jury.

74. If in this case the question is formulated in Bolam terms as "whether the practice of the professional making the diagnosis accorded with a respectable body of opinion within the profession", that question is indistinguishable in practice from the question whether the error was one which would be made by a professional exercising reasonable skill and care; the very test propounded by Lord Clyde in Huntley.

75. In a case involving advice, treatment or both, opposed expert opinions may in a sense both be "right", in that each represents a respectable body of professional opinion. The same is not true of a pure diagnosis case such as the present, where there is no weighing of risks and benefits, only misreporting which may or may not be negligent. The experts expressing opposing views on that issue cannot both be right. And the issue is, par excellence a matter for the decision of the court, which should not, as a matter of constitutional propriety, be delegated to the expert.…

79. However, I am bound by the law as it currently stands, to approach that issue by reference to a possible invocation of the Bolitho exception. I must not, therefore, reject Dr Foria's view unless I am persuaded that it does not hold water, in the senses discussed in Lord Browne- Wilkinson's speech in Bolitho and developed in other cases: that is to say, if it is untenable in logic or otherwise flawed in some manner rendering its conclusion indefensible and impermissible.”

27 In *Brady v Southend University Hospital NHS Foundation Trust* [2020] EWCC 157 (QB) it was held that the determination of what the CT scans showed (i.e. (i) omental infarction or infection, (ii) whether the mass involved the lesser omentum, (iii) whether the mass was infiltrating the transverse colon), were essentially questions of fact for the Court to determine on the balance of probabilities, with the assistance of the witness and expert evidence provided. In relation to whether the clinicians’ assessment, even if conflicting with the Court’s findings of fact, were negligent or not, their work was to be judged in accordance with *Penney* by invocation of the *Bolitho* exception. Insofar as the Judge was required to assess their views on advancing differential diagnoses or recommending further investigation of treatment the *Bolam* test with the *Bolitho* qualification arose [27].

28 The decision of Green J in C *v North Cumbria University Hospitals NHS Trust* [2014] EWHC 61 (QB) sets out the following principles and considerations that apply to the assessment of expert evidence by the Court [25]:

> "i. Where a body of appropriate expert opinion considers that an act or omission alleged to be negligent is reasonable a Court will attach substantial weight to that opinion.
> ii. This is so even if there is another body of appropriate opinion which condemns the same act or omission as negligent.
> iii. The Court in making this assessment must not however delegate the task of deciding the issue to the expert. It is ultimately an issue for the Court, taking into account of that expert evidence, must decide for itself.
> iv. In making an assessment of whether to accept an expert's opinion the Court should take account of a variety of factors including (but not limited to): whether the evidence is tendered in good faith; whether the expert is "responsible", "competent" and/or "respectable"; and whether the opinion is reasonable and logical.
> v. Good faith: A *sine qua non* for treating an expert's opinion as valid and relevant is that it is tendered in good faith. However, the mere fact that one or more expert opinions are tendered in good faith is not *per se* sufficient for a conclusion that a defendant's conduct, endorsed by expert opinion tendered in good faith, necessarily accords with sound medical practice.
> vi. Responsible/competent/respectable: In *Bolitho* Lord Brown Wilkinson cited each of these three adjectives as relevant to the exercise of assessment of an expert opinion. The judge appeared to treat these as relevant to whether the opinion was "logical". It seems to me that whilst they may be relevant to whether an opinion is "logical" they may not be determinative of that issue. A highly responsible and competent expert of the highest degree of respectability may, nonetheless, proffer a conclusion that a Court does not accept, ultimately, as "logical". Nonetheless these are material considerations. In the course of my discussions with Counsel, both of whom are hugely experienced in matters of clinical negligence, I queried the sorts of matters that might fall within these headings. The following are illustrations which arose from that discussion. "Competence" is a matter which flows from qualifications and experience. In the context of allegations of clinical negligence in an NHS setting particular weight may be accorded to an expert with a lengthy experience in the NHS. Such a person expressing an opinion about normal clinical conditions will be doing so with first hand knowledge of the environment that medical professionals work under within the NHS and with a broad range of experience of the issue in dispute. This does not mean to say that an expert with a lesser level of NHS experience necessarily lacks the same degree of competence; but I do accept that lengthy experience within the NHS is a matter of significance. By the same token an expert who retired 10 years ago and whose retirement is spent expressing expert opinions may turn out to be far removed from the fray and much more likely to form an opinion divorced from current practical reality. "Respectability" is also a matter to be taken into account. Its absence might be a rare occurrence, but many judges and litigators have come across so called experts who can "talk the talk" but who veer towards the eccentric or unacceptable end of the spectrum. Regrettably there are, in many fields of law, individuals who profess expertise but who, on true analysis, must be categorised as "fringe". A "responsible" expert is one who does not adapt an extreme position,

who will make the necessary concessions and who adheres to the spirit as well as the words of his professional declaration (see CPR35 and the PD and Protocol). vii. Logic/reasonableness: By far and away the most important consideration is the logic of the expert opinion tendered. A Judge should not simply accept an expert opinion; it should be tested both against the other evidence tendered during the course of a trial, and, against its internal consistency. For example, a judge will consider whether the expert opinion accords with the inferences properly to be drawn from the Clinical Notes or the CTG. A judge will ask whether the expert has addressed all the relevant considerations which applied at the time of the alleged negligent act or omission. If there are manufacturer's or clinical guidelines, a Court will consider whether the expert has addressed these and placed the defendant's conduct in their context. There are 2 other points which arise in this case which I would mention. First, a matter of some importance is whether the expert opinion reflects the evidence that has emerged in the course of the trial. Far too often in cases of all sorts experts prepare their evidence in advance of trial making a variety of evidential assumptions and then fail or omit to address themselves to the question of whether these assumptions, and the inferences and opinions drawn therefrom, remain current at the time they come to tender their evidence in the trial. An expert's report will lack logic if, at the point in which it is tendered, it is out of date and not reflective of the evidence in the case as it has unfolded. Secondly, a further issue arising in the present case emerges from the trenchant criticisms that Mr Spencer QC, for the Claimant, made of the Defendant's two experts due to the incomplete and sometimes inaccurate nature of the summaries of the relevant facts (and in particular the Clinical Notes) that were contained within their reports. It seems to me that it is good practice for experts to ensure that when they are reciting critical matters, such as Clinical Notes, they do so with precision. These notes represent short documents (in the present case two sides only) but form the basis for an important part of the analytical task of the Court. If an expert is giving a précis then that should be expressly stated in the body of the opinion and, ideally, the Notes should be annexed and accurately cross-referred to by the expert. If, however, the account from within the body of the expert opinion is intended to constitute the bedrock for the subsequent opinion then accuracy is a virtue. Having said this, the task of the Court is to see beyond stylistic blemishes and to concentrate upon the pith and substance of the expert opinion and to then evaluate its content against the evidence as a whole and thereby to assess its logic. If on analysis of the report as a whole the opinion conveyed is from a person of real experience, exhibiting competence and respectability, and it is consistent with the surrounding evidence, and of course internally logical, this is an opinion which a judge should attach considerable weight to."

29 In this case, the court is tasked with making a series of evidential evaluations of witnesses who give significantly opposed and irreconcilable evidence. The court approaches evidence evaluation on the basis of the following principles derived from a wide range of authority. I reduce the law to 13 propositions:

(1) **Burden of proof**. The burden of proof (to the conventional civil standard of a balance of probabilities) rests on the person who asserts the affirmative of the issue (she or he who asserts must prove), for 'Onus is always on a person who asserts a proposition of fact that is not self-evident' (*Robins v National Trust Co.* [1927] AC 515 at 520, per Viscount Dunedin); to determine which party asserts the affirmative,

regard must be had to the substance of the issue, not the way it is pleaded or framed (*Soward v Leggatt* (1836) 7 C. & P. 613);

(2) **Evidence-based findings and inference**. Findings of fact must be based on evidence, including inferences that can properly (fairly and safely) be drawn from the evidence, but not mere speculation (*Re A (A child) (Fact Finding Hearing: Speculation)* [2011] EWCA Civ 12, per Munby LJ);

(3) **Survey range and contextual evaluation**. The court must survey the "wide canvas" of the evidence (*Re U, Re B (Serious injuries: Standard of Proof)* [2004] EWCA Civ 567 at [26], per Dame Elizabeth Butler-Sloss P); the factual determination "must be based on all available materials" (*A County Council v A Mother and others* [2005] EWHC Fam. 31 at [44], per Ryder J (as then was)); and must "consider each piece of evidence in the context of all the other evidence" (*Devon County Council v EB & Ors.* [2013] EWHC Fam. 968 at [57], per Baker J (as then was));

(4) **Process iteration**. The evaluative process must be iterative, considering all the evidence recursively before reaching any final conclusion, but the court must start somewhere (*Re A (A Child)* [2022] EWCA Civ 1652 at [34], per Peter Jackson J (as then was)):

> "… the judge had to start somewhere and that was how the case had been pleaded. However, it should be acknowledged that she could equally have taken the allegations in a different order, perhaps chronological. What mattered was that she sufficiently analysed the evidence overall and correlated the main elements with each other before coming to her final conclusion."

(5) **Decisiveness**. The court must decide whether the fact in dispute, if relevant to determination of the issue, is proved or not: indecisiveness – "fence-sitting" - is not permitted (*In re B* [2008] UKSC 35 at [32], per Lady Hale);

(6) **Binary truth values**. The law invokes a binary system of truth values in respect of facts in issue (*In re B* at [2], per Lord Hoffmann):

> "If a legal rule requires a fact to be proved (a "fact in issue"), a judge or jury must decide whether or not it happened. There is no room for a finding that it might have happened. The law operates a binary system in which the only values are 0 and 1. The fact either happened or it did not. If the tribunal is left in doubt, the doubt is resolved by a rule that one party or the other carries the burden of proof. If the party who bears the burden of proof fails to discharge it, a value of 0 is returned and the fact is treated as not having happened. If he does discharge it, a value of 1 is returned and the fact is treated as having happened."[1]

(7) **Forensic yardsticks**. The assessment of the inherent worth of the evidence may include measuring it against a number of recognised and recurring forensic yardsticks:

[1] Recently affirmed by Supreme Court on facts in issue (*R (on the application of Pearce and another) v Parole Board of England and Wales* [2023] UKSC 13 at [65.(i)]).

a) Internal consistency/coherence; historical consistency or self-contradiction; credit (previous dishonest, discreditable or reprehensible acts, if relevant); factors identified by Lord Bingham writing extra-judicially;[2]

b) External consistency/validity – testing it against "known and probable facts" (*Natwest Markets Plc v Bilta (UK) Ltd* [2021] EWCA Civ 680 at [49], per Asplin, Andrews and Birss LJJ, jointly), since it is prudent "to test [witnesses'] veracity by reference to the objective facts proved independently of their testimony, in particular by reference to the documents in the case" (*The Ocean Frost* [1985] 1 Lloyd's Rep 1 at p.57, per Robert Goff LJ);[3]

(8) **Memory**. There are important and recognised limits on the reliability of human memory:

(a) Our memory is a notoriously imperfect and fallible recording device; the more confident a witness appears does not necessarily translate to a correspondingly more accurate recollection; the process of civil litigation itself subjects the memory to "powerful biases", particularly where a witness has a "tie of loyalty" to a party (*Gestmin SCPS S.A. v Credit Suisse (UK) Ltd* [2013] EWHC 3560 (Comm) at [15]-[22], per Leggatt J (as then was));

(b) The court should be wary of "story-creep", as memory fades and accounts are repeated over steadily elapsing time (*Lancashire County Council v C, M and F (Children – Fact-finding)* [2014] EWFC 3 at [9], per Peter Jackson J);

(9) **Probability/improbability**. The court "takes account of any inherent probability or improbability of an event having occurred as part of the natural process of reasoning" (*Re BR (Proof of Facts)* [2015] EWFC 41 at [7], per Peter Jackson J); "Common sense, not law, requires that … regard should be had, to whatever extent appropriate, to inherent probabilities" (*In re B* at [15], per Lord Hoffmann);

(10) **Contemporaneous documents**. Contemporary documents are "always of the utmost importance" (*Onassis v Vergottis* [1968] 2 Lloyd's Rep. 403 at 431, per Lord Pearce), but in their absence, greater weight will be placed on inherent probability or improbability of witness's accounts:

> "It is necessary to bear in mind, however, that this is not one of those cases in which the accounts given by the witnesses can be tested by reference to a body of contemporaneous documents. As a result the judge was forced to rely heavily on his assessment of the witnesses and the inherent plausibility or implausibility of their accounts." (*Jafari-Fini v Skillglass Ltd* [2007] EWCA Civ 261 at [80], per Moore-Bick LJ);

And to same effect:

[2] Bingham, T. (2000) *The Business of Judging: Selected Essays and Speeches.* (Oxford: Oxford University Press), p.3.

[3] *The Ocean Frost* was a fraud case, but Mostyn J is surely correct that the principle of external verification must be 'of general application' (*Lachaux v Lachaux* [2017] EWHC 385 (Fam) at [37]).

> "Faced with documentary lacunae of this nature, the judge has little choice but to fall back on considerations such as the overall plausibility of the evidence" (*Natwest Markets* at [50]).

(11) **Cross-relevance**. The judge can use findings or provisional findings affecting the credibility of a witness on one issue in respect of another (*Bank St Petersburg PJSC v Arkhangelsky* [2020] EWCA Civ 408); for evidence must not be evaluated "in separate compartments" (*Re T* [2004] EWCA Civ 558 at [33], per Dame Elizabeth Butler-Sloss P);

(12) **Non-determinativeness**. However, the court must be vigilant to avoid the fallacy that adverse credibility conclusions/findings on one issue are determinative of another and/or render the witness's evidence worthless. They are simply relevant:

> "If a court concludes that a witness has lied about a matter, it does not follow that he has lied about everything." (*R v Lucas* [1981] QB 720, per Lord Lane CJ);

Similarly, Charles J:

> "a conclusion that a person is lying or telling the truth about point A does not mean that he is lying or telling the truth about point B..." (*A Local Authority v K, D and L* [2005] EWHC 144 (Fam) at [28]).

What is necessary is (a) a self-direction about possible "innocent" reasons/explanations for the lies (if that they be); and (b) a recognition that a witness may lie about some things and yet be truthful "on the essentials … the underlying realities" (*Re A (A Child) (No.2)* [2011] EWCA Civ 12 at [104], per Munby LJ).

(13) **Demeanour**. Decisions should not be based "solely" on demeanour (*Re M (Children)* [2013] EWCA Civ 1147 at [12], per Macur LJ); but demeanour, fairly assessed in context, retains a place in the overall evaluation of credibility: see *Re B-M (Children: Findings of Fact)* [2021] EWCA Civ 1371, per Ryder LJ:

> "a witness's demeanour may offer important information to the court about what sort of a person the witness truly is, and consequently whether an account of past events or future intentions is likely to be reliable' (at [23]); so long as 'due allowance [is] made for the pressures that may arise from the process of giving evidence" (at [25]).

But ultimately, demeanour alone is rarely likely to be decisive. Atkin LJ said it almost 100 years ago (*Societe d'Avances Commerciales (SA Egyptienne) v Merchans' Marine Insurance Co (The "Palitana")* (1924) 20 Ll. L. Rep. 140 at 152):

> "… an ounce of intrinsic merit or demerit in the evidence, that is to say, the value of the comparison of evidence with known facts, is worth pounds of demeanour."

30 To conclude, I emphasise that the burden rests exclusively on the claimant to prove breach on a balance of probabilities. The defendant has to prove nothing. When I say that any particular fact has been found by the court, I mean that the claimant has proved it on the evidence to that requisite civil standard.

§IV. Professional Standards

31 At the outset of this trial there appeared to be a dispute about the meaning and implications of the governing professional standards. The applicable standard, as of October 2010, was published by the Board of the Faculty of Clinical Radiology in 2006. It is 12 pages long, including references. In the defendant's skeleton, filed just before the trial, it is submitted at para.47 that:

> "The guidelines are drafted in the context of findings relevant to the patient's current condition and clinical symptoms."

Then counsel submits:

> " Dr Landes' reliance on the Guidelines to support her conclusions that ALL findings (no matter how subtle) must be reported is misinformed."

32 This submission appears to be based on the expert advice of Dr Raghavan. I shall come to the passages in Dr Raghavan's report that must have founded this submission later, and whether by the end of the trial the dispute between parties about the standard appear to have vanished. It became common ground that the entire image should be viewed with equal professional diligence and that possible abnormalities should be reported, including those that were subtle, and that included those there were incidental to the clinical question for the referral. That is because in the current/future context section of this Standard it states:

> "In all patients, but particularly in circumstances where the principal purpose of radiological investigation is to exclude pathology, knowledge of the negative predictive value of an examination and the necessity for, and accuracy of, further tests will be required. In addition, review of images requested for a particular purpose may reveal incidental findings or pathology unrelated to the initial request, requiring a wider knowledge of disease processes and their imaging manifestations than is at first apparent."

33 Equally in para. C of the Standard, "Observation", it states:

> "Radiologists are trained observers. Both 'passive' and 'active' observation are used, i.e. abnormalities will strike those with a trained eye, but the images must also be specifically interrogated in appropriate viewing conditions to ensure that all findings have been noted. On the basis of these observations the following may be found:
>
> - Normal findings
> - Unequivocal abnormal findings, both anticipated and unanticipated
> - Findings that may be normal or abnormal
> - Normal variants."

34 Ms Mauladad is correct when she submits that the standards are, as she put it, "a starting-point", but are not the end point and not determinative. They are a relevant factor that the court must have regard to in evaluating a question of breach. However, as the trial developed there was no dispute ultimately about the meaning of the Standard. The case was confined to the question about the degree of obviousness or otherwise of these particular

abnormalities and whether to use that language at para.C of the Standard, that the findings "may be abnormal".

§V. Radiologists' Evidence

35 I will deal with the radiologists' evidence in the order it was given, Dr Steward first and then Dr Boavida. I will provide a brief assessment at the end of each account but will reserve my principal analysis for the Discussion section in Section VII.

Dr Steward

36 Dr Steward wrote a statement on 25 March 2022 and a supplemental statement on 4 November of that year. He is currently a consultant at the Whittington Hospital in London. In October 2010 he was a radiology fellow at UCL Hospital and about to become a consultant. He had just passed his fellowship exams. He had all his training fresh in his mind. He was a GI (gastrointestinal) specialist. The sub-specialism takes six months to a year to complete. He had started his radiology specialism in 2005, so he had been practising in radiology for several years before the date he examined the x-rays in question.

37 The viewing screens they used to view the images were quite big, he said, like a large computer monitor screen. He would have looked at the images and he was trained in ultrasound. He said when he was cross-examined that:

> "The films always looked slightly abnormal. You cannot see the femur head and the epiphysis because it has not ossified. You would not see it on the x-ray but you would see it on ultrasound. That makes it more complicated."

38 At the time he would have known what DDH is. He would have known what to look for if there was a referral for DDH. He said:

> "I would be looking round the hips for a bowel that is poking down and that is a subtle detail."

That was a reference to the referral clinical question, and he said, "As a hernia would be in the area of the hips", he would be looking at the hips for a cortical breach. He would have looked at the hip area:

> "I would have looked at the whole film. I would have looked at the spine for abnormalities and the ribs for fractures."

39 He said he would have started at the chest and he would have looked at the chest and ribs to ensure there was not a hairline crack or anything like that. He would look at the heart. He would look at the overlying structures and any external bodies. He said that then:

> "I would have gone down to the abdomen and the pelvis and looked at it there, and the pelvis and the hips area and carefully interrogated film."

He said that at the time in his practice he would have been using ultrasound to look at hip dysplasia.

40 The court's assessment of Dr Steward was that he was a rather nervous and sometimes unclear witness. But these are largely questions of demeanour and I certainly do not hold that against him. It is difficult and daunting to appear in the witness box in the High Court even if you are an experienced consultant. Dr Steward was a senior registrar and he was on the cusp of becoming a consultant. He was thus an experienced doctor in radiology as at October 2010. Whilst his sub-specialism was GI, his core specialism was - and it appears still is - radiology, which involves the assessment of images. In 2010 the digital screens they used were big, computer-like monitor screens. He had been asked to look at the images because this neonate was having difficulties with food. This problem resolved.

41 He said that he was very familiar with the professional standards. He was very used to dealing with bone or skeletal examinations of x-rays. He used to do ultrasounds where there was a suspicion of DDH and he knew what to look for if there was a referral for DDH and what its signs were. By October 2010 he had seen a case of dysplasia at Great Ormond Street in an older paediatric case. He was in a paediatric radiology department.

42 He said that scanning is usually to confirm a suspicion or a diagnosis reached through palpitation or examination. He would look around the whole x-ray for any abnormalities. He would look at the whole image to look for details and also for other clinical information. He might find unexpected abnormalities in x-ray. He said:

> "It is part of our duty to view that whole x-ray to see if there are other problems. You interrogate the image to answer the clinical question but you have to look at the rest of the image with the same clinical and professional diligence. If you see something that is, or is not, an abnormality, which is quite common in neonate films, if it is something serious you would record it."

43 When it is not a dedicated film and it is not clear-cut then, he said, you have to be careful not to "overcall which could cause also distress to the parents". But he stated in evidence that if he saw something in a baby that could be hip dysplasia, he would report it. He agreed that hip dysplasia is a serious condition for babies and if it is not found it can have serious consequences. He said:

> "I am looking very carefully for very subtle signs, as these are neonates in a neonatal ward."

44 It would take him about five to ten minutes to look at the three films and this takes longer than the FRC examination standard of 30 films in 30 minutes. He said in his statement at para.21 that:

> "The clinical questions that were posed were not a simple Yes/No, type of question such that there would have been a detailed review of the imaging."

He said continued at para.22:

> "I would have looked at the hips for any abnormalities but the absence of comment in my report indicates that I did not make a positive finding in my review."

He said:

> "If it might be an abnormality, I would want to report it."

If he thought it was, he would have reported it.

45 So he looked at the eight images, and the experts have found abnormalities in all of them, but he saw no abnormalities at all. As he said in response to the court's question:

> "In paediatrics you would err on the side of caution and report, because babies are vulnerable. If I saw a possible problem with a baby's hip at two or three days old, I would report it."

Dr Boavida

46 Dr Boavida made statements on 15 November 2022 and 25 March 2023. He is now based at the Homerton Hospital. He reported on the first image, that of 11.29 from 15 October. When he looked at the image he looked at the previous images that had been produced in the case.

47 His review of the claimant's image was 18 months from the end of his training. He had come across all manner of muscular and skeletal issues. He had performed ultrasound imaging of children's hips. He said:

> "I had a lot of experience in that period and it was a very busy job."

48 He was developing a paediatric radiology experience. When he looked at the images now, he says, he still cannot see evidence of subluxation but, as the experts see that subluxation, he can see why the experts arrived at that joint conclusion. But in 2010 there would have been a greater chance of his spotting subluxation because he was doing paediatric radiology all of the time.

49 In his statement at B94 at para.22 he says:

> "For the reasons I have given I do not believe that I would have had hip dislocation on my mind for the purposes of reviewing and reporting on the x-ray, which was taken at around 11.29 on 15 October 2010."

50 Dr Boavida further emphasised that once a possible abnormality was identified it was for the clinician in charge to decide if it was relevant. In his opinion, clinical examination was key. After all a child is under the care of a clinician and it is the clinician who puts it all together. He said:

> "I really do not think most radiologists would have spotted it. I had just done my exams and was at the top of my game in reporting in October 2010."

He added that he would have looked for fractures and would have looked at the hips. He said:

> "Whether I would have looked for this kind of hip dysplasia I cannot recall."

51 He said in re-examination that there was no reason he would have looked at the whole image less carefully than during his normal practice. When the court asked him a question, he said he thinks that he did look at the hips because it was his usual practice to look at everything. When he looked at the hips, he would be looking for fractures, which can be very subtle including fine fractures that are barely visible. He is looking for subtle indications all the time as that is part of his job.

52 At an early stage in radiology training, there is an emphasis on findings on the periphery of the images that are not obvious, and that is a big part of how they are trained because there is an emphasis on findings on those peripheries as well as the central question. That is a big part of the doctor's practice; i.e. Dr Boavida's practice. He said:

> "If I saw subtle evidence of what I believed was hip dysplasia I would have reported it."

53 The court's assessment of Dr Boavida is this. I found him to be a gentle and, if I may say so, charmingly courteous witness. He was not at that point as experienced as Dr Steward, but he was developing his paediatric radiology professional experience and he was gaining a lot of it in his busy working life. Part of the job is to spot things on the images, as he put it, that others would not spot; that is what a radiologist's contribution is. He knew that DDH was a serious condition and he knew that if it was caught early enough it could be treated. He knew the basic anatomy of how the femur fitted into the hip via the acetabulum. He said to the court that you review the whole film as it is "a good opportunity to identify pathology that may be missing".

54 When he looked at the whole film, he has made it part of his practice throughout his career to be thorough in checking the entirety of it for while often the most striking abnormalities may be seen in the centre of the image and that is where people look, he has made it his practice to look carefully at the whole image. He said it is important to look at everything because "there is a human being there", and he sees that as an important part of his job.

55 He said that if he suspected hip dysplasia he would report it and that includes if he was not sure if it was hip dysplasia but it could be. Incidental findings, he says, are an important part of his day-to-day job and the default is, he says, to report it to avoid a problem being missed. He therefore frequently reports incidental findings and those where he suspected an abnormality, but he was not sure or certain about it.

56 Hip dysplasia was, as he put it, "a big part of his job". Definitely in "the top ten", and likely to be in "the top five of problems they did ultrasounds of babies for." He was looking at the hips at some point of his review and he was looking for abnormalities, and if he saw something that might be DDH he would report it.

57 It was put to him by counsel that he was starting to go "down a rabbit hole", and was only looking for issues to do with the referred clinical question about gastrointestinal problems. He disputed that that was what happened. He said that he would state the abnormality, or the possible abnormality, as it may not be a definitive finding. There does not need to be a definitive finding. There needs to be, as he put it succinctly, "an index of suspicion".

58 I turn next to the expert evidence.

§VI. Expert Evidence

59 I deal first with the evidence of Dr Caren Landes and then with Dr Raghavan.

Dr Landes

60 Dr Landes' report is dated September 2022. She is a consultant paediatric radiologist at the Alder Hey Children's Hospital. She has a special interest in musculoskeletal radiology including imaging in suspected physical abuse cases. She says she is the radiology trauma lead for the regular orthopaedic, rheumatology, major trauma and skeletal dysplasia of multidisciplinary team meetings at the Alder Hey Children's NHS Foundation Trust.

61 She is also a radiology lead and has been involved in the development of the Royal College of Radiologists Standards for imaging in paediatric major trauma. Outside her NHS workload she works as an expert paediatric radiologist, particularly in cases involving musculoskeletal imaging including child protection cases.

62 She has a special interest in musculoskeletal imaging. She is one of the five or six experts in the country in relation to imaging in suspected non-accidental injury. She spends 20 per cent of her week doing non-accidental injury child protection work, but describes herself as a general paediatric radiologist.

63 Her evidence about this case, in short, is as follows. The hips were abnormally aligned. She says that the abnormalities were obvious and that reasonable, competent practitioners would spot the abnormality. At the very least the abnormalities as they appear on the x-rays would fall into the category of being findings that may be abnormal. Thus she says there was a breach of duty in not identifying the abnormalities, reporting them and recommending clinical review and further imaging by ultrasound. While the investigation method of choice is ultrasound for hip dysplasia in a neonate, she says that such abnormalities can be identified with x-rays. As to each image, her evidence is as follows.

64 In the first image at 11.29, the PACS system allows manipulation of the image to make it bigger and to take measurements. The right hip appears normal because of the position of the leg. On the left leg however, the bone is normal, but the position is abnormal because it should line up with the joint. The gap between the femur and the ischium is too large or too wide. A reasonable practitioner should have spotted that gap.

65 In respect of x-ray two, 15.33 on 15 October, she says in respect of the right hip that you can draw a line a line through the shaft of the bone. The femoral head bone is not aligning to the joint and the gap between the femur and the ischium is too wide. The acetabulum looked shallow and you can measure it. The standard is 28 degrees or smaller. If it is shallow it means that the acetabulum is flattened and thus will not fit in the wall of the femoral head and thus the bone could slip or slide out.

66 In respect of the 15.33 left hip, she said it was difficult in this film because the hip was held in abduction. On the left hip a reasonable practitioner would not have spotted the abnormality. On the right hip a reasonable practitioner should have spotted the abnormality. The acetabulum to the left does look a bit shallow but it would be reasonable not to spot it.

67 In respect of x-ray three, 10.41 on 16 October, she says of the right hip that the leg is pointing down and abducted. If you draw a line along the centre of the bone it is not aligned at the joint. The gap between the ischium and the femur is unusually wide. The thing about the PACS system is that you can draw lines. Radiologists are trained in the use of the system and thus they can draw lines. The acetabulum is shallow. It is closer to the perpendicular than to the horizontal. A reasonable radiologist would be expected to identify the abnormality on that image. She is not critical of the left acetabulum as you cannot really see it.

68 When she was cross-examined, she confirmed that she was a paediatrician as a senior house officer. She changed from paediatrics to radiology. She changed because as a paediatrician she took the job home and could not switch off. But with radiology she could make the diagnosis and have a better life balance. She did years of general radiology and a year of skeletal radiology. Radiology is not a definitive diagnosis. It is indicative as she put it. Radiologists make a judgement. There is only one place the femoral head could be. You just cannot see it on the x-ray.

69 Of the reports of Dr Boavida and Dr Steward, she accepted that the rest of their reports are of a good standard. Except, she added, they do not mention the abnormalities that they should have identified. She accepted that she would not expect a radiologist to measure angles. It is something she did to confirm her suspicion. But it is something they could have done. The 28 degrees that she mentioned in evidence applies to children over 4 months. She said that she mentioned it because it was supporting evidence of the angle of the hips. She said, "I think as radiologists, you use all the tools available to you".

70 In this case, the proximal femur is not aligned to the acetabulum, so describing a shallow acetabulum is reasonable. But, she said:

> "I am suggesting they could have measured angles to confirm a concern that the hip is malaligned."

But she accepted that there is no reference standard of a gap between the femur and the ischium. Her evidence was:

> "I can see where the femur and the femoral head are pointing and I know what normal looks like, and I would expect a competent radiologist to know what normal looks like. If you know what is normal then you can say what it is and why. It is not the actual metric measurement."

But she accepted it is easier when you can see the femoral head. She later said:

> "It is difficult to accurately locate but you can infer the location of the femoral head where the metaxas is."

71 As to the *Bolam* test she was referred to p.161 of the bundle and her report, where she said:

> "A reasonable body of radiologists should have identified it."

Meaning the abnormality. She accepted this was not an accurate expression of the *Bolam* test. She said:

> "I should have worded it differently. I would say that no reasonable and responsible body of radiologists would have failed to identify or report these abnormalities."

72 She said this neonate had the hips held in a frog or abducted position so there are only a few occasions to view them in the other extended position. But nevertheless she said that her feeling is no reasonable body of radiologists would not say that these hips could be normal and not need further investigation. In respect of the second image, the 15.33 image, she said that after discussion with Dr Raghavan she agreed that the position of the left hip may seem not aligned due to the positioning and the labelling. She said:

> "My first view, and I still feel it, is that it is abnormal. But I agree that it is not easy to assess. I should have been clear in the joint statement that it is difficult to assess, not that it had to be assessed."

73 She was asked by counsel, "Should you have put in your original report that there is no reference range or angles?" Her answer was:

> "I put it in the joint statement. In this case I would not have expected a reporting radiologist to have measured the angles. I should have been clearer that 28 degrees is not published."

She used it to support her conclusion about the possible abnormality. Thus to her it was supporting evidence to confirm what she saw overall. She said that no reasonable body of radiologists would have failed to notice that the hip was not aligned. She would expect a radiologist at Great Ormond Street to look at the image, but she did not know if they did. However, at Great Ormond Street they were looking at the images to see if it was safe to do a contrast study. The radiologists at Great Ormond Street might not have even looked at the hips.

74 She confirmed that her letter of instructions, dated 16 February, stated that the images "clearly showed hip dysplasia". Also in respect of Mr Roposch's conclusions, it was put to her that she was told his outcome or conclusion, and she said:

> "I saw his film at 14 months so I knew he had stated his conclusions as hip dysplasia and dislocated hip ."

In conclusion she said, "I think this is an obvious abnormality."

75 I turn to the court's assessment of Dr Landes. Her evidence is challenged about a number of points but in particular:

> (1) Whether her expertise affected her judgment. Did her expertise colour her conclusion of what a reasonable and responsible radiologist should have identified?
> (2) Biases: both hindsight and outcome bias. Did the information she was given affect her conclusion? This was because she knew from the instructions that a claimant had been diagnosed with DDH and Mr Roposch considered on the x-rays that it was "very clear" that the hip was dislocated. Did this create bias?
> (3) The misapplication of the *Bolam* test.

76 I look at each of these issues in turn.

77 **Issue 1: expertise affecting judgment**. It is submitted that Dr Landes' evidence in respect of the 15.33 scan shows how she held radiologists to too high a standard. In her report on reviewing the imaging she concluded "the left hip is held in abduction but even in this position there is the impression of malalignment of the left femoral head within the acetabulum". She concluded at B161 that a reasonable body of radiologists should have identified the abnormalities.

78 In the joint statement, Dr Landes accepts that the abnormality would have been difficult to identify. Her trial testimony was:

> "I have a degree of expertise and on my first view I felt that this was abnormal. I still feel it is abnormal and I appreciate that the expertise has to be put aside for this. So in relation to this, a responsible body of reporting radiologists at the time may agree with Dr Raghavan that it is not easy to assess."

79 Therefore the conclusion of the court, in respect of the 15.33 left hip and Dr Landes' report, is that in the report she concluded it was a breach of duty. She later accepted in the joint statement, and her testimony, that this conclusion cannot be sustained. Thus, on this point, her report was incorrect.

80 However, the court also finds that she is a reasonable and reflective expert, who reassessed her conclusions and modified them. She is certainly not an expert who steadfastly and stubbornly adheres to their first conclusion without deviation. What this meant is that the court removed the 15.33 left hip as being any conceivable instance of a breach of duty.

81 This topic also focussed analysis onto those abnormalities that should have been identified according to Dr Landes. A paradox of this exchange and Dr Landes' concession is that it gave the court confidence in her balance and fairness. Where she felt she had overstated the case she acknowledged her error. It demonstrated to the court that she was not a partisan expert, but was someone the court could trust to reflect on images and contrary opinion.

82 **Issue 2: biases**. There are two biases that were put to her; both are important. There are of course numerous definitions of these biases but I summarise them as follows. Hindsight bias operates when subsequent information about a past event or experience leads us to think it was more predictable or detectable than it was at the time, thus the after the event information affects the estimation of what should have been known or identified at the time making it seem likely or predictable in retrospect.

83 Outcome bias operates in a similar way. It occurs when a known outcome affects the evaluation of what should have been known, seen or detected, and it manifests as a recognised tendency to attribute more readily when the clinical outcome is serious (see the Realm Standards Appendix 5 at B298).

84 Here the after-the-fact information included that Mr Roposch concluded that it was very clear from the x-rays that the hip was dislocated. The outcome was that the claimant did have DDH and had had surgery for it. This can be seen from Dr Landes' instructions. They specifically framed the question she had to answer in this way:

> "Do you agree that the neonatal abnormality x-rays from UCLH indicate that the hips were dislocated?"

The instructions further stated:

> "The claimant saw Mr Roposch, a consultant orthopaedic surgeon, in December 2011. The claimant was x-rayed and diagnosed with lateral hip dysplasia. Mr Roposch reviewed the neonatal abdominal x-rays and suggested that these were reviewed in the light of his findings. During his consultations he noted that it would have been very clear from these x-rays that the hip was dislocated and it should have been picked up sooner." (See B176J)

85 These instructions were not included in Dr Landes' report. However, they were confirmed during the course of the trial as the information that she had received. I do not count this against her as being an attempt to conceal relevant information from the court. However, it would have been better for her to include the precise terms of her instructions in her report. But I do not find that that omission impairs her credibility or reliability. The real question is whether such instructions produce outcome and/or hindsight basis.

86 About the effect of such biases, we have the evidence of Dr Raghavan. He stated that approximately 40 per cent of his work comes from claimant instructions. The majority of the instructions he received tell you, as he put it, "some information". That is information about the diagnosis or outcome. He said that, "I mean rarely do you just get asked to review images with no information". He continued:

> "It most often does not prevent me approaching the case with an open mind. In cases where the findings are subtle I am able to remain unbiased when knowing the previous diagnosis."

87 Dr Landes very candidly recognised the general existence and impact of such biases. She stated in evidence:

> "If I had known about dysplasia [I interject: she did] it would focus my attention on the pelvis but it would not influence my conclusion about whether there was an abnormality."

Thus the instructions focussed the area of attention. The question is whether or not they influenced her conclusion that there was an abnormality. That was what her judgement and expertise was brought in to help resolve, whether there was sufficient evidence of abnormality that it should have been obvious to all reasonable radiologists. Her evidence on this point was:

> "Was there enough evidence to say that a competent radiologist would say we should talk to the clinician about it?"

In other words, whether it should be reported and not just left so a decision could be made by a treating clinician about whether to obtain an ultrasound. She felt that if the matter had been reported by the radiologist it was most inevitable that an ultrasound would be obtained. But that is not a question I have to decide today. That is a next step in these proceedings. As a footnote I should add that Dr Landes considered that an ultrasound was, "100 per cent likely", and Dr Raghavan thought it was "probable".

88 The defendant's stance is that bias operates at a "subconscious" level. That is an unconscious level, so one cannot know the nature and extent of the impact. But this applies to all experts having been told the outcome when providing their opinion retrospectively. Dr Raghavan makes it plain that for him it is something he can put to one side, as being told of the outcome is something that frequently happens. This makes sense as it is unrealistic to imagine that experts are habitually just sent a number of x-rays without any context or comment and asked to give their opinion. The only way to unequivocally eliminate the possibilities of hindsight and outcome bias is to have a system where images are sent to experts without any commentary whatsoever. As Dr Raghavan makes plain, that is often not what happens in this jurisdiction. Thus while Dr Landes cannot quantify the extent nor indeed whether these biases were operative, nor can the defendant. It is purely speculative to say that Dr Landes was affected by them. It is, of course, not for the defendant to prove the existence of such a bias. It is for the claimant to satisfy the court that they did not materially impair Dr Landes' conclusion.

89 The starting-point is that there is no evidence that she was affected by either bias or, if so, the extent of it - what in scientific terms is called "the effect size". These effects are sometimes measured in a laboratory in psychological controlled tests. But this is a court of law. It is not realistic and fanciful for the court to speculate about these phenomena without any evidence to suggest their impact or effect in this case. Furthermore, consultant radiologists are sensitised to the risk of hindsight and outcome bias. It is drilled into them (see, for example, Dr Raghavan at pp.378 to 379 of the transcript). Dr Landes explained that she regularly participates in what are called the REALMS, i.e. Radiology Events and Learning Meetings. She has done so since 2006. These take place around six times a year, which means that Dr Landes has attended numerous such specialist meetings. At Appendix 5 of the Standards for Radiology Events and Learning Meetings, at B298 to 299, the biases that might have effect reviewers are set out and addressed.

90 I find that there is no evidence that bias has materially impaired Dr Landes' conclusion. Thus the question of bias does not materially impact the court's assessment of Dr Landes' credibility. That is because in the circumstances of this case to do so would be to embark on unwarranted and impermissible speculation. The matter must be assessed in the proper context, which is the evidence. The evidence is that Dr Landes' view, rightly or wrongly, is that the abnormalities were obvious. However, to her this was not a marginal case when knowing the diagnosis and outcome may have tipped her judgment over the edge, and it must be viewed in the context of Dr Raghavan's evidence that having outcome or diagnosis information in instructions occurs frequently and he is able to put it to one side in coming to an independent and impartial clinical judgment.

91 Therefore the court has no reason to think that Dr Landes did not do precisely the same. To her this was a clear case of obvious abnormality. Either she is right about this or she is not. I will come back to that in due course, as the evidence of experts must always be viewed in the context of the totality of the evidence.

92 **Issue 3, Misapplication of the *Bolam* test**. In her written and oral opinion Dr Landes repeated on a number of occasions that, "a reasonable body of radiologists should have identified the abnormal position" (see for example B161). That formulation of the applicable test by Dr Landes in her report is wrong. The way that Ms Mauladad frames it is correct. That is that no reasonable and responsible body of radiologists would have failed to see the abnormalities. This mirrors the formulation of Green J in the case of C *v North*

Cumbria University Hospitals NHS Trust [2014] EWHC 61 (QB). At para.21 Green J states:

> "The question is whether no reasonably competent midwife would have acted and exercised her judgment in the way in which the midwife that had to administer the second dose did."

93 Dr Landes was asked in her evidence at the trial what her conclusion was, using the accepted *Bolam* test. Her opinion was clear, and she repeated it several times, that no reasonable and responsible radiologist would have missed the abnormalities, or at least there was sufficient evidence of the possibility of hip abnormalities so that they should be reported. This is the conclusion that the court must judge. I do not find that her misapplication of the test of the report significantly affects the weight of a conclusion about whether or not these abnormalities were obvious. It was plain from what she said that the evidence in the images of abnormality was clear and obvious. The question is whether she is right.

94 The defendant argues that Dr Landes reaches a conclusion of breach of duty for many reasons, each of which is flawed. First, the position of the femur; second, the acetabulum angles; and third, the femur-ischium gap. I will examine each in turn.

95 First, the femur position. Dr Landes' evidence is the femur has to be shifted across but at the same angle, and she demonstrated this by drawing lines on the images. The criticism of Dr Landes is that radiologists are not required to draw computer-generated lines. This is true. But it is open to radiologists to use the PACS technology to assist them in reaching conclusions about abnormalities. Whilst it is not mandated, it is open to a competent radiologist to draw the lines should she or he feel that it would help to determine whether there may be an abnormality. However, a more important point is why Dr Landes drew the lines. It was to demonstrate the position of the femur and thus its head, not visible but inescapably attached to the end of it because, as she put it, "it cannot be anywhere else". Whilst lines may assist, the overall position of the femur in relation to the socket it had to fit into can be viewed on the screen, or it can be "eyeballed", to use the term that Dr Raghavan adopted from his instructions.

96 I do not understand Dr Landes' evidence to be that the drawing of lines was essential to her conclusion about breach. It was rather in the form of a demonstration of where the femur should be positioned and where and how in fact it was. I must return to Dr Landes' point: what is significant is the overall position and orientation of the femur. That is evident whether there is a line that has been drawn or not.

97 Second, she gave evidence about the acetabular angles. In her report the left acetabular angle on the 15.33 image was measured at 32 degrees. The right acetabular angle was measured at 33 degrees for the 10.41 image from 16 October. The criticism is that there is not a recognised reference range for acetabular angles in neonates. Further, it is not routine for radiologists to measure the acetabular angle. Dr Landes accepted that there is no formal reference range for acetabular angles in neonates. Whilst it is not routine for radiologist to measure the angles, it is certainly something open and available to them to do with the technology at their disposal. But the point that Ms Mauladad makes is a strong one, it seems to me. The fact that there is no definitive range in neonates reduces the amount of weight that can be placed on this factor. However, a degree of balance must be introduced and the court must assess the evidence of Dr Landes as a whole. She stated in terms:

> "I would not expect a radiologist to measure the angles. It is something I did to confirm my suspicion."

Thus Dr Landes was using the acetabular angle to support her suspicion that the hip was out of place, not to diagnose it definitively. She used the angles as additional and complimentary evidence to judge the overall picture. The fact that a radiologist here did not measure angles is nothing to be held against them. Certainly, I find that not all reasonable radiologists would have measured the acetabulum angle.

98 Third, the gap between femur and ischium. Dr Landes stated that in various images the gap was too wide. A criticism of Dr Landes is that there is not a reference range for the gap between the ischium and the femur in neonates. However, she stated that one can use one's experience to decide whether the femoral head is too far from the ischium. She went on to state that in most neonatal films new-born legs held in the abducted, frog position. A criticism is that there is then no opportunity to gain experience of how the bones should be arranged.

99 The difficulty with this criticism is that while most images have neonate's legs spread aside, not all of them do. In about 10 per cent of images she said the legs are held down, or "extended" as she put. This would provide an opportunity for seeing the arrangement of the femur and the hip in the proper configuration. But realism must be introduced. It is part and parcel of the training of radiologists reviewing neonatal images to know the proper orientation of the femur in relation to the hips. It is basic anatomy and physiology. Further, both radiologists were reviewing ultrasounds where the same question would arise, albeit with the additional benefit of being able to see the femoral head that is not evident on x-rays as it has not yet ossified.

100 So I turn to the court's overall conclusion in respect of Dr Landes. In its closing submissions the defendant, in my judgment, has misunderstood the nature of Dr Landes' demonstration in court of by marking the images. She did not say that the radiologists were in breach of duty because they failed to make the markings that she did. Instead, she used the technology to demonstrate to the court - visibly and graphically rather than descriptively - the evidence that supported her conclusion that the hip abnormality was clear and obvious.

101 The problem with the overall criticism of Dr Landes about these very matters is that it fails to understand the essential thrust of the doctor's evidence: that one must look at the whole picture together. It is by putting this full picture together and looking at the composite impression that Dr Landes concluded that the evidence of hip abnormality was obvious. It is not necessary to annotate the images with lines to establish it. One can simply see the angle of the femur without having to draw a line from its centre. However, by making the drawing one can achieve a greater degree of precision. One can broadly see the femoral position in relation to the ischium without measuring it with precision. One can put the pieces of information together to gain an overall assessment to determine possible abnormalities. It must be remembered that the exercise is not one of definitively diagnosing DDH. Instead, the duty of the radiologist was to assess something different: whether there may be abnormalities in the images of the new-born before them. Abnormalities of whatever nature and not confined to the clinical question. Abnormalities like this hip abnormality were incidental. Dr Landes was asked if the reports of the doctors' were of a good standard. She said they were except they did not mention the abnormalities that should have been identified, and that is what this case is about, whether all competent radiologists would have identified the abnormalities.

102 I next turn to the evidence of Dr Raghavan before the court decides its assessment of these two experts side by side.

Dr Raghavan

103 Dr Raghavan is a registered medical specialist, as he puts it "a specialist consultant radiologist". The posts he has held from 2004 until the present day include being a consultant radiologist at the Sheffield Children's Hospital and the Jessop Wing of the Sheffield Teaching Hospital, Obstetrics and Neonatal since 2003/2004. He is a Fellow in paediatric radiology at the Westmead Children's Hospital in Sydney, Australia. He trained in neuro-radiology at the National Institute of Mental Health in Bangalore, India. His professional instructions are divided approximately into advising the defendant for 60 per cent of the time and the claimant for 40 per cent.

104 The essence of his opinion is as follows. Although he identified the abnormalities, he says that it was reasonable for the radiologists not to identify the abnormalities here. These abnormalities were subtle and only identifiable with expertise. As he put it in his original report at B195:

> "The majority of reasonable and responsible radiologists would have not detected the subtle abnormalities that I have with the benefit of hindsight."

He says that for someone who has not been exposed to thousands of x-rays of hip dysplasia it is almost "impossible" to pick this up.

105 My assessment of Dr Raghavan is as follows. I found him, presentationally, to be a courteous and engaging professional. He is someone who plainly would have a gentle and reassuring bedside manner. But the court's evaluation is not about external surface matters of this kind. It is about the substance, the intrinsic worth of a witness's evidence. It is to this I turn. The defendant urges the court to prefer Dr Raghavan's evidence to Dr Landes' and to reject her fundamentally contrary opinion, because both cannot be right. As with Dr Landes, the opposing party made several criticisms of Dr Raghavan's evidence, and I examine them by dividing them into six groups.

106 **Issue 1**. The starting point is Dr Raghavan's report. It is dated September 2022 and at B191 he states:

> "The majority of reasonable and responsible radiologists will not consider the evaluation of the hips to be a necessary part of the evaluation of neonatal film." (See para.5.8)

107 It is, no doubt, based on this opinion of Dr Raghavan - its instructed expert - that the defendant pleaded in its defence at para.34(b) of the amended defence that:

> "The defendant avers the x-rays were taken to evaluation the chest and abdomen. There was no clinical indication of any lower limb issues which would necessitate a review of the same. Therefore it was not within the scope of a radiologist nor the clinician's duty to review the images of the claimant's hips."

108 This stance was confirmed by the defendant's opening skeleton argument dated 19 June, that is, just before trial. At para.5 of the written skeleton it is said:

> "In Dr Raghavan's opinion he would not expect the reporting radiologist to have identified the abnormality at the time of reporting as the findings are too subtle, particularly since the clinical question was related to another area on the film."

109 When challenged about that comment in his report, Dr Raghavan said that what he wrote was "incomplete". He accepted you always have to view the hips. He stated that what he had meant to say was that the sentence should have read, "But it was not the duty to review the images for evaluation of the hips for hip dysplasia". (See transcript p.337) He accepted in evidence that "absolutely" one did have to scrutinise the whole image with equal rigor. But the sentence quoted from Dr Raghavan's report must be seen in the context of the other sentences in the same paragraph, and what he goes on to say is that the subluxation could have been missed by a reasonably competent radiologist, "particularly when the imaging was requested for problems with the abdomen". What he thus appears to have been suggesting in his original report is that a different standard of scrutiny applies to areas of the image, other than those relating to the direct clinical question; which is in keeping with the earlier sentence that it was not a duty to review the hips when the hips did not form part of the clinical question.

110 In the judgment of the court the doctor's stance in his report is at significant variance with the applicable professional standard, which required an answer to the clinical question posed. But also "an assessment of the whole image for relevant and/or unexpected findings". (See p.260) In his evidence he did go on to accept that "a radiologist should always review the hips". What is the consequence of all this? This part of the defence has now been abandoned at trial. The court finds it difficult to understand how Dr Raghavan's evidence on this topic is consistent. It is not. It is clear that the comment in his report is wrong. Any suggestion that the whole of the image did not need to be reviewed was wrong. It is an obvious error and, I judge, it is important and not trivial. It became absolutely clear that the defendant's radiology witnesses accepted that their duty was to survey the whole film for abnormalities with equal thoroughness. Reading Dr Raghavan's report the impression is given that it was only necessary to survey the hips if there was a prior clinical indication; that was what the pleaded defence asserted. Or at the very least abnormalities other than those connected to the clinical question could be missed reasonably, because they were not what the referral was about. Thus the explicit words of Dr Raghavan's report that the survey of the hips were not within the scope of the radiologist's duty, as it was put in the defence, were wrong. The court does not accept the doctor's final evidence that he made a slip, a drafting error, in his report. In his final written evidence he offered a particular view about the duty and degree of review on the clinical referral question. Then, when giving evidence in court he said something different. The sequence is important. He was the last witness, after the two radiologists and Dr Landes had given evidence. He changed his position. It was not convincing. This is an important matter. It affects the court's assessment of Dr Raghavan's reliability. But I emphasise that reliability is not a binary thing. See for example the words of Charles J in *A Local Authority v. K & Ors* [2005] EWHC 144 (Fam) at para.28, which can be applied with modification. The judge said:

> "... a conclusion that a person is lying or telling the truth about point A does not mean that he is lying or telling the truth about point B."

111 I do not suggest for an instant that Dr Raghavan is not telling the truth. The question is his reliability. I do not reject the entirety of his evidence as a result, but the weight of his evidence is affected. Dr Raghavan originally suggested that the majority of competent radiologists would not look at the hips. It is essential to note what he wrote, not some or a reasonable body, but the *majority* of radiologists would not view the hips. This is suggesting a lower standard that he now distances himself from. It is not unconnected to the core question. This is because he was suggesting that the majority of competent radiologists would not look at this area, thus it makes it likely that the signs of abnormality there might reasonably be missed. He now accepts that this approach is wrong.

112 **Issue 2**. This is about the difficulty of identifying the abnormality. At trial Dr Raghavan said that it was "almost impossible" to spot the abnormalities unless you have reviewed thousands of hip dysplasia images. When he was challenged about this, he changed his characterisation to it being "extremely difficult" to identify. To suggest that these abnormalities were almost impossible to identify strikes me as a very significant increase in the level of difficulty of identification compared to his report. Why is it on exactly the same materials that Dr Raghavan has “hyped up” the level of difficulty? Why did he then reduce the level from "impossible" to "extremely difficult"? The result is that his evidence on the degree of difficulty is inconsistent. This affects his reliability. When he said that it is a "very set skill", if he is restricting his comment to the definitive diagnose of hip dysplasia from x-rays, he might be right. In the end this is what the orthopaedic consultant, Mr Roposch, has done. X-rays are not used in diagnosing hip dysplasia in neonates. Ultrasound is. But the question under consideration is different. It is whether all reasonable and responsible radiologists would have identified a possible abnormality in the hip. It was not to definitively diagnose but to identify a possible abnormality. I have considerable reservations whether the detection of a possible hip abnormality in a neonate requires a "very set skill" beyond that of the reasonable and responsible radiologist who is undertaking the examination of the neonate x-rays. I find that Dr Raghavan is overstating the case.

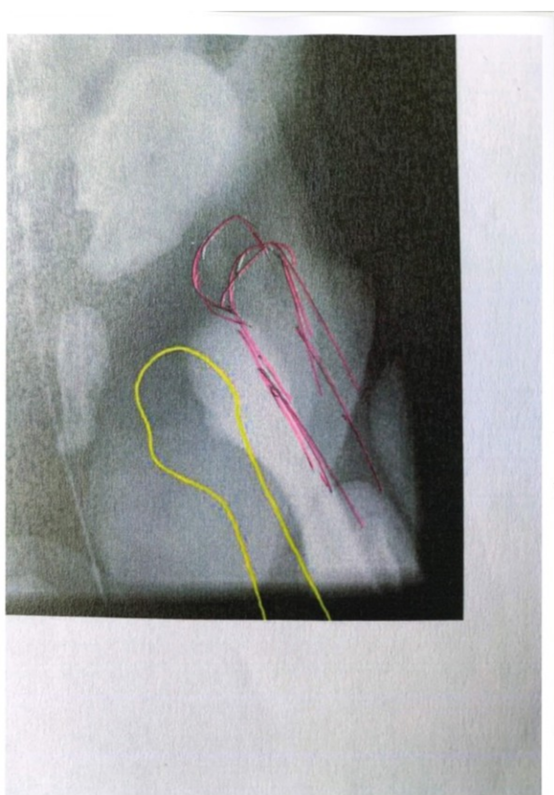
113 **Issue 3**. Not reporting abnormalities. Considerable time was spent during the trial exploring an answer that Dr Raghavan gave about his reporting practice. He disclosed that for 20 years he has not reported certain evidence of subluxation in neonatal x-rays. He referred specifically to five patients whose x-rays he had reviewed the day before giving evidence in this case, in which there had been evidence of subluxation but he had "done nothing about it". This was counsel's expression, which he agreed. (See the transcript at p.353)

114 He confirmed to the court that he had not told those children’s parents about what he had found in terms of possible subluxation. He gave this evidence it seems in part in support of his great expertise and judgment. But I cannot see how it is consistent with the applicable standards. He went on to say that he would expect a reasonable radiologist to report evidence of subluxation. Yet over the past two decades there have been cases involving new-borns in which he has not. His explanation is that if in fact there is an abnormality it will be picked up clinically later in testing, that is, the physical manipulation process that exists in this country. That is why he said:

> "I am not really concerned about missing subtle findings of hip dysplasia."

115 This was new evidence he gave at trial, because he accepted that he had never before said that it would be appropriate to spot an abnormality and not report it. When challenged about this he accepted that this was a significant matter that he should have mentioned in his report but failed to do. His approach strikes me as being puzzling. It is true and of benefit that there is a clinical testing procedure in this country. But if a medical professional has identified signs of an abnormality or a possible abnormality in a new-born child it does seem to be a risk-laden approach to refuse to report it. No system of testing is infallible, as the experience of these courts make absolutely plain. It is surely better to conform to the safeguarding standards in the published professional advice and report possible abnormalities identified. That was the evidence of the two radiologists who examined the claimant's images. It is now accepted by the defendant but, irrespective of that, it is surely the right approach and is at variance with Dr Raghavan's personal practice in certain cases. Certainly, Dr Boavida stated that he would report even subtle evidence of hip dysplasia, and I agree with the claimant on this question. Dr Raghavan's personal approach does veer towards the "eccentric or unacceptable end of the spectrum", as it was put by Greene J in the case of *Re C* at para.25(vi). Or, at least, it raises questions about the reliability of his overall approach and judgments.

116 **Issue 4**. Marking the image. As a result of his approach to non-reporting, Dr Raghavan was asked to indicate the extent of the abnormality that would be necessary before it would be "picked up"; i.e. identified on an x-ray. He marked his conclusion from a copy of the claimant's x-ray. His markings at first were not very clear, though I emphasise through no fault of his own, so the court invited the parties to agree a duplicate image with the positioning, as marked by Dr Raghavan, marked on it in a visible way. It is included in this judgment so anybody, including members of the public, can look at what the doctor identified and marked.



X-ray of the claimant's left leg/hip area.

The yellow markings indicate the proper alignment of the top of the femur and the hip. The pink markings were drawn by Dr Raghavan to indicate the extent of bone malalignment to be identifiable. (reproduced with permission).

117 When one looks at it, one immediately sees that Dr Raghavan's markings show the femur almost as far to one side of the leg as one could possibly imagine. Dr Raghavan's evidence about this was that this was the level of abnormality that he judged necessary to be picked up before it was reported. This was tantamount to a dislocation. Indeed in evidence he said:

> "I say to be picked up it needs to be dislocated more or less." (See transcript, p.372)

118 This seems to me to be extraordinary evidence and implausible. Indeed, Dr Raghavan accepted that using the term "almost impossible" is "too extreme". If there is a dislocation to the extent that Dr Raghavan depicted, then that degree of abnormality would be obvious and glaring. It should unquestionably be reported by all reasonable, competent radiologists. But what Dr Raghavan's position fails to make sufficient allowance for, it seems to me, is that there may be deviations where the alignment is less severe. These would indicate that there may be an abnormality and these are capable of being identified on an x-ray. I cannot accept that there is not a class of cases where there may be abnormalities short of dislocation, which all reasonable radiologists would fail to see. If this is the thrust of Dr Raghavan's evidence, I reject it. Certainly, the opposite is the import of Dr Landes' evidence, that such a class of possible abnormalities, short of dislocation, exists and can be identified by all reasonable and responsible radiologists. The question becomes whether the abnormality in the claimant's hip fell into that class of deviation. The court found Dr Raghavan's evidence on the image marking and his explanation for it unconvincing and implausible. The court rejects it.

119 **Issue 5**. In the defence at para.27(b) the defendant's position in respect of the 15.33 image was provided. It was pleaded that:

> "There were changes of a dislocated hip, right side. However this finding was subtle and evident in retrospect with the knowledge that the claimant has suffered hip dysplasia and had undergone corrective surgery."

120 There was a question about the basis of this part of the defence and how it was pleaded. Was it counsel's characterisation or did it come from Dr Raghavan? The court gave the parties an opportunity to confirm the position. It was clarified that this part of the defence was based on the evidence of Dr Raghavan (see the defendant's closing skeleton at para.44(2)). But his initial evidence was that at 15.33 there was evidence of dislocation of the hip. The defence was amended. The doctor's view changed to the abnormality "certainly not being a dislocation". It resulted in an amendment to the defence and the word "subluxation" was substituted. However, this part of the evidence is illuminating. The defendant now suggests that the use of the word "dislocation" was an error by Dr Raghavan. Yet it also indicates that initially Dr Raghavan believed that the degree of abnormality was more than he was later to profess. I emphasise, however, that I do not place too much weight on this issue. There are, it seems to me, more important questions that exist.

121 **Issue 6**. Abduction. Abduction is when the legs are folded or spread in a froglike position. Dr Raghavan's report at para.3.9 states:

> "The cause of the alignment is the position of the baby when the x-ray was taken, with the hip being mobile it tends to sublux with abduction of the left leg as can be seen in most neonatal abdominal x-rays. There are no other causes of the altered alignment."

122 However, Dr Raghavan failed to consider that the alignment could also have been in part explained by the fact that this new-born suffered from hip dysplasia. This was an obvious possible contributing factor that he failed to take into account. This also raises questions about the rigor and reliability of his approach.

123 That concludes my survey of Dr Raghavan. I must now compare the experts side by side, and do so in the next section. It is vital that the court specifies which expert it prefers and why. I do so in the context of the totality of the evidence, putting everything together, and emphasise that the court does not decide the case on experts. Experts perform a vital and important function, but each of the court's decisions is made in the context of all the evidence.

§VII. Discussion and Disposal

124 The development of x-ray imaging at the end of the 19th century was a major development in medical practice. It has been of benefit to countless millions of people and helped improve the quality of their life. The difficulty with x-rays is that they present the hidden or concealed essence of the subject in a two-dimensional pattern of ghostly black and white forms. However, as Dr Boavida poignantly stated, "There is a human being there". Here it was a new-born. A human being so young that he did not qualify in medical terms as a baby but a neonate. He was highly vulnerable. There was a high degree of need to review his x-rays, the entirety of them, carefully for three things:

> (1) To answer the clinical question.
> (2) To identify other clear abnormalities; and
> (3) To identify anything else that may be an abnormality.

125 That is what the governing standards mandated. Nobody in this trial dissents from that view. Thus the question for the court is whether no reasonable and responsible radiologist would have failed to identify the hip abnormalities that the claimant undoubtedly suffered from. It would have been an incidental finding, as the clinical question was not about hip dysplasia. But as Dr Boavida put it, incidental findings are part of the radiologists day to day job. So there is nothing significant in the fact that the abnormality is incidental. At most it is a question of the sequence in which that area of the image would be viewed with equal rigor. It would make sense, of course, to begin with the area of the clinical question. But it does not end there for a competent radiologist; it cannot stop there. An incidental finding should be made by a competent radiologist if it was sufficiently clear. Thus the only question in this case is whether the claimant's hip abnormality was sufficiently clear to that standard.

126 There is a fundamental conflict of evidence between the two experts who speak to this issue. I emphasise that the proper course is not to decide the matter on expert evidence exclusively. The evidence must be assessed in the context of all the other evidence in front of the court and that is the approach I have taken. I have taken into account that the two radiologists failed to spot the hip abnormalities in the x-rays. Dr Boavida had only one

opportunity. Dr Steward had considerably more. He had eight. Thus in fairness to the defendant, and especially to both radiologists, I take into account the fact that they did not identify the abnormalities, but one must be cautious about circularity.

127 First, I emphasise that it is for the claimant to prove that the abnormalities were sufficiently clear to the requisite standard. The defendant has to prove nothing.

128 Second, one cannot simply assert that if one seeks to argue the fact that the two radiologists in question did not identify the claimant's abnormalities does not establish that they were not identifiable. While I take into account their evidence, there must be some independent objective yardstick - that is the standard of reasonableness. The measure is that of reasonable, responsible and competent radiologists, and that is the point of the expert evidence to assist the court in reaching a conclusion based on the entirety of the evidence. The question is whether I find that the hip abnormality was so evident and clear that it should have been seen by all competent radiologists. That is why both parties have instructed a radiology expert.

129 The court strongly prefers the evidence of Dr Landes to Dr Raghavan. I prefer her evidence because I find it to be reasonable, authoritative and convincing. It is consistent with what was clear to see on the images. I reject Dr Raghavan's evidence. His evidence overall was unsatisfactory and not reliable. It was inconsistent and unreasonable about the level of difficulty in identifying abnormalities. It was not reliable and implausible about the extent of the abnormality that would justify reporting or for it be picked up, a matter that affected but did not determine my overall assessment of his worth as a witness. These things cannot be surgically separated. His evidence was puzzling and concerning about his practice of not reporting possible abnormalities in very young and vulnerable neonates and babies.

130 Therefore, the court strongly prefers Dr Landes' evidence. Her evidence seems to me to be clearly supported by what can be seen on the images themselves, and also what the two radiologists stated that they were looking for: signs of subtle abnormality, including in the area around the hip.

131 Having been told and shown what the indications of DDH abnormality are in the images, I can absolutely see why Dr Landes says that these abnormalities were obvious, or at the very least it was obvious that there may be an abnormality. I find that this conclusion by Dr Landes is reasonable, plausible and reliable. I accept it as being significantly more consistent with the rest of the evidence. I prefer it to the conclusion of Dr Raghavan whose opinion on this question the court rejects. In doing so I recognise that it is the duty of the court to make the decision on whether the abnormalities reached the level of obviousness such that all competent radiologists would have identified them.

132 In my judgment the images themselves provide strong support for Dr Landes' conclusion that annotation of what the arrangement of the bones should have been in the absence of that abnormality, makes plain that the divergence from the normal arrangement was clear. In all of this I exclude the left hip in the 15.33 image due to the concession of Dr Landes. I have made these findings based on the evidence and on a balance of probability. Both radiologists at UCLH knew what the signs of DDH were. All reasonable and responsible radiologists would do so when viewing neonatal images. The chief difference with ultrasounds is that the femoral head can be seen while it is not there on x-rays because it has not ossified. But both doctors had experience of looking for DDH with ultrasounds. For Dr Boavida it was one of the most frequently occurring conditions in babies he was

encountering, possibly in the top five. But Dr Boavida did not have DDH as he put it, "on his mind" when he viewed the claimant's image. Yet at that very point in time he was, as he put is, "having paediatric radiology all of the time". He had just had his exams and was at the top of his “game” in reporting and would be looking at the hips for very subtle signs of hip fracture that can be barely visible. Thus, the hips would be examined to look for subtle signs of abnormality.

133 I find on a balance of probabilities that he did not look with reasonable and sufficient care at the hip area and missed the obvious hip abnormalities. At the very least it was, to use Dr Boavida's term, "an index of suspicion" that there might be an abnormality. But DDH was not on his mind. This was a missed opportunity. As Dr Boavida said in terms, an x-ray is "a good opportunity to identify pathology that may be missing". He failed to spot it. The court concludes that no reasonable and responsible radiologist would have failed to identify it.

134 As for Dr Steward, he was looking at the hip area. He was looking for any subtle signs of abnormality in the form of indications of a hernia. I find that he also did not look at the hip area with reasonable and sufficient care and he missed the obvious hip abnormalities. At the very least I find on a balance of probability that he missed the sign that the claimant may have had a hip abnormality. I find that all reasonable and responsible radiologists would have identified these abnormalities or possible abnormalities. Dr Steward had eight opportunities, and the experts found abnormalities on all of the eight images but he saw none of them. Dr Steward said in evidence "you are looking very carefully for very subtle signs because these are nenoates on the neonatal ward". I find that no reasonable and responsible radiologist would have failed to identify that this claimant may have had a hip abnormality, precisely as Dr Landes said.

135 To conclude, doctors are not machines. They are still, for now, humans. They are fallible. There is no doubt that the two radiologists in this case missed the fact that this claimant, so recently arriving in the world, had an abnormality of the hip, or may have had one. A question for the court is not whether they should have spotted the defective alignment of the bones. It is whether no reasonable and responsible radiologist would have failed to see that there might be an abnormality of the hip. They were not required to make a definitive diagnosis. X-ray imaging is not the method of choice in respect of neonatal hip abnormalities or DDH. Instead, their task was to assess whether on the image they were examining there was a possible abnormality. If so, their duty was to report it, so that is the vital question - possible abnormalities. As Dr Landes accurately put it, radiology is not definitive. It is indicative. Here I find to the requisite civil standard that there were clear and sufficient indications of possible abnormality. The indicative signs of possible abnormality were sufficiently plain and evident, such that all reasonable and responsible radiologists should have identified them. Put the other way, my judgment is that no reasonable and responsible radiologist would have failed to see that there was this possible abnormality.

136 I accept Dr Landes' evidence that a competent radiologist would know what the normal alignment of the hips would look like as a matter of routine and elementary anatomy. It seems absurd to suggest otherwise. DDH is, as Dr Boavida stated, one of the conditions that was most frequently the cause of referral for these very young human beings for ultrasounds. That evidence tallies with the journal article the parties agreed to be admitted, which shows that the prevalence is approximately 1 per cent of neonates, put very broadly.

It is not a matter that requires intensely specialist knowledge beyond the reach of the reasonable, competent radiologist reviewing neonatal images.

137 I also accept Dr Landes' evidence that while ultrasound is the diagnostic tool of choice, that does not prevent abnormalities or more critically potential abnormalities being identified on x-rays. It must be remembered that the hip dysplasia here was diagnosed 14 months later from the x-rays. But I make allowance for the fact that such diagnosis was by a specialist consultant. Nevertheless, this was a diagnosis from x-ray images. The images are of good quality and the nature and degree of the abnormality observable is clear. To do this you do not need to draw the lines or take angled measurements. You compare what is presented in the claimant's images with what is normal for a neonate. You might reasonably take into account the high percentage of neonates who have unstable hips. You do not need to know the precise figure just that it is a significant percentage. With that understanding you form an overall impression. You look at the images for possible abnormalities of sufficient nature and extent to cause you concern. How do you do that? You use your medical knowledge and your training. You use your expertise as a trained and experienced radiologist and thus as trained observers. Trained, as Dr Boavida put it, to see what is there or might be there that other people have missed. Not just the obvious, but the subtle signs of possible abnormality. You are not unaided. You have tools. You have a sophisticated medical imaging system, a PACS radiology information system. You can blow the images up. You can zoom in on areas of concern. You can compare the images with other images. In short you can do what you are trained to do.

138 This case is not a question of risk assessment and discretionary reporting or non-reporting of abnormalities. It is about whether the abnormalities or the possible abnormalities should have been identified. This being so, and looking carefully at the totality of the evidence both globally and holistically, I conclude that the failure to identify the abnormality of the hips by both radiologists was outside the range of professional conduct by all reasonable and responsible radiologists. Radiologists are nothing if not trained medical observers. In reaching this finding the court has been itself acutely aware of the risks of both hindsight and outcome bias. I have ensured, and I have reminded myself, to put both the ultimate diagnosis of the claimant and his development of hip dysplasia to one side. Instead, I have strictly focussed on the intrinsic value of the expert evidence in the context of all the other evidence.

139 A necessary implication of the court's findings is that the claimant through his mother has proved on the balance of probabilities that the defendant breached its duty of care to him. The claimant had just come into the world. He was negligently treated by the defendant. He was entitled to expect an examination of his x-rays of a quality that, as the Dean of the Royal College of Radiology said in her forward to the governing professional standards, "maintained good, safe patient care". Here, in the reviews of the claimant's images, none of them complied with that minimum professional standard of care.

140 It is important now that I have given the court’s conclusions that something is now mentioned as a matter of courtesy and respect to this child, who is now 12, and to his mother. His hip dysplasia has had profound, irreversible, life-altering consequences for him and his family. He has had bouts of repeated surgery in his life. He is able to walk independently but unsteadily. Bilateral hip dysplasia has significantly affected his mobility. He may need further surgery and joint replacements. I underline that those consequences have got nothing whatsoever to do with my decision on breach of duty. It is equally important to emphasise that I have not made any decision on causation. I must also stress

that the court's decision today does not bring these proceedings to a conclusion. There are other aspects of this tort action to resolve. If parties cannot agree them this court will decide.

141 I intend that this case to be brought on for any further disputed issues as soon as it is possible to do so. The claimant and his mother are entitled to that comfort, whatever any future decision might be. I will give the parties the opportunity to reflect on the terms of this judgment before listing it for any further directions or consequentials. This court has a duty to further the overriding objective by actively case managing the claim for the purposes of the Civil Procedure Rules 1.1 and 1.4. 1.4 provides insofar as it is material:

> "(2) Active case management includes -
>
> (a) encouraging the parties to co-operate with each other in the conduct of the proceedings ...
> (e) encouraging the parties to use an alternative dispute resolution (GL) procedure if the court considers that appropriate and facilitating the use of such procedure ... "

142 I do encourage the parties to cooperate and to try to resolve any outstanding disputes without further litigation unless strictly necessary. I emphasise that the court remains available to parties to provide any assistance should an indication assist.

143 This judgment will be published to the National Archives. One day the claimant may wish to read it. It is, after all, about him and his entry into the world. It is his judgment as much as anybody else's. I also want to pay tribute to his mother, who sat through the trial and heard distressing details about her child, but who nevertheless conducted herself with dignity, poise and respect.

144 That is my judgment.