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IN THE HIGH COURT OF SOUTH AFRICA
[CAPE OF GOOD HOPE PROVINCIAL DIVISION]

CASE NO: 9230/2005

In the matter between:

YANGA KOSANA **Plaintiff**

and

THE MEC FOR HEALTH, WESTERN CAPE **Defendant**

JUDGMENT DELIVERED ON 23rd JANUARY 2008

HJ ERASMUS, J

Introduction

[1] The plaintiff is Yanga Kosana in her representative capacity as mother and legal guardian on behalf of Philasandre Kosana (hereafter "Philisandre" or "the baby") who was born on 6th January 2002.

[2] The defendant is the Minister of Health, Western Cape, in his official capacity as the member of the Executive Council responsible for health in the Western Cape, which includes the George Hospital, George.

[3] On 6th January 2002 the plaintiff was admitted to the George Hospital and gave birth to Philasandre. On 8th January 2002 the baby was diagnosed as having yellow jaundice. She was given two exchange transfusions, the second after a peripheral arterial line was inserted into the left radial artery. After the second exchange transfusion, the baby developed a swollen left arm and hand. She was discharged from hospital on the 2nd February 2002. On 7th February 2002 she was re-admitted to the George Hospital and on 19th February 2002 her left arm was amputated below the elbow.

[4] On 14th September 2005 the plaintiff issued summons against the defendant claiming damages in the amount of R9 298 936.00 for alleged medical negligence on the part of members of the staff of the George Hospital.

[5] At the commencement of the trial, I ordered, at the request of the parties, a separation of the issues in terms of Rule 33(4). The subsequent trail was concerned only with the questions of liability and causation. At the trial, the plaintiff was represented by Mr PF Cloete; the defendant by Mr D Irish and Ms N Bawa.

The course of events

[6] In order to place in perspective, the issues in dispute and the expert and other evidence adduced by the parties, it will be convenient at this stage to set out in broad terms the course of principal events as it unfolded during the period 6th January 2002 (when the baby born) to 19th

February 2002 (when her left forearm was amputated). The facts are largely common cause.

[7] Philisandre was a healthy infant: at birth she weighed 3260g and the Apgar score was 9/10, 10/10 and 10/10 at 1, 5 and 10 minutes.

[8] On the morning of 8th January 2002 the nursing records indicate that the infant appeared to be jaundiced. A total serum bilirubin (TSB) was requested. The TSB value was high and double-light phototherapy was instituted. A diagnosis of ABO blood group incompatibility was made. The TSB value kept increasing and on 9th January it was decided to perform an exchange transfusion. An umbilical venous catheter was inserted and the exchange transfusion was performed in the early evening of 9th January. During the exchange transfusion, the baby's condition deteriorated. She became tachypnoeic, had nasal flairing and a slight grunt. The exchange transfusion was stopped for a while and oxygen by head box was administered. After the completion of the exchange transfusion, the baby showed signs of tachypnoea and renal failure. A blood count done after the exchange transfusion showed a low haemoglobin level and high platelet count.

[9] The total serum bilirubin level kept increasing and it was decided to perform a second exchange transfusion. The second exchange transfusion was performed in the early evening of 10th January. A peripheral arterial line was inserted into the left radial artery. This radial artery cannula was inserted as blood could no longer be withdrawn from the umbilical venous line even after the umbilical venous catheter had been replaced in order to secure an open venous line. Fluid could however still be transfused through the line. The exchange transfusion

was done by the withdrawal of blood through the arterial line and the infusion of blood through the umbilical venous catheter.

[10] Prior to the first exchange transfusion there were signs of haemolysis. After the first and second exchange transfusions there were signs of ongoing haemolysis and of a bleeding tendency which manifested itself as haematuria (blood in the urine) and haematochezia (blood per rectum). Presumably because of the infant's bleeding tendency (haematuria and haematochezia) it was decided in the early hours of 11th January to discontinue the heparin which had hitherto been added to the saline solution administered through the arterial line.

[11] Some hours after the completion of the second exchange transfusion, the baby became pyrexic and tachycardic; she had a high blood glucose level, a prolonged capillary filling time and was tachypnoeic. Dr J Smit, the paediatrician on call, was consulted. An infection screen was ordered; dexamethasone was administered for a possible blood transfusion reaction; intravenous antibiotics was commenced to counter any septicaemia and a bolus (50ml) of normal saline was given.

[12] Dr Breytenbach assessed the baby at about 10h00 on 11th January and described her as acutely ill, possibly due to either septicaemia, or to meningitis or to kernicterus. She had apnoeic spells and was treated with phenobarbitone as Dr Breytenbach was concerned that the apnoea may have been convulsions related to early kernicterus. It was not clear at that stage whether the apnoeic spells could be attributed to septicaemia or to the previously high bilirubin levels.

[13] There were no signs on 11th January of compromised arterial blood supply to the baby's left hand and fingers, such as pallor, coolness, poor capillary refill time or discolouration. On the contrary, the patient persistently demonstrated both a good radial pulse and good capillary refill time.

[14] At 14h20 on 11th January a blood culture is performed but the site from where the culture was taken is not recorded. At the time when the blood culture was performed the nursing staff noted that it appeared as if the arterial line had tissued ("arteriële lyn in weefsel"). Dr Van der Walt, a consultant paediatrician, was summoned. She noticed that the left arm was swollen. Dr Van der Walt testified that when she saw the initial swelling at approximately 14h45 on 11th January, it was very minor and in fact she had to compare the arms to notice it. She said that the "area was not well circumscribed. It was a vague fullness on the middle part of the inner arm." She identified it as being halfway between the elbow and the wrist and more to the ulnar side. The limb's vascularity was not compromised.

[15] Dr Van der Walt was able to withdraw blood from the arterial line but encountered resistance when she tested injecting saline through the line. She accordingly decided to remove both the arterial line and the umbilical venous line, which was leaking blood. In view of the improvement of the baby's haemological status, it was at that time unlikely that another exchange transfusion would be required.

[16] From the blood culture, a gram positive staphylococcus aureus was cultured and reported on 13th January. Treatment with the anti-biotic Rocephin (Cefriaxone) was continued.

[17] Further blood tests at 15h00 on 11th January 2002 reflect a white cell count of 15.3, and a lower platelet count of 34 (a blood test taken at 6h40 on the morning of 11th January reflected a platelet count of 56). At about 20h00 on 11th January the baby is given a transfusion of platelets. The full blood count of the blood sample taken at 08h00 on 12th January showed a high white cell count of 25.3 (Professor Kirsten pointed out that the white blood cell counts were influenced by the donor blood used during the exchange transfusion, as well as the two doses of dexamethasone: corticosteroids increase the total white blood cell count.); and an increased, but even after the transfusion still below normal range, platelet count of 121. A blood sample taken at approximately 08h45 on 13th January showed a slightly lower white cell count of 20.2, decreased platelets of 83 and a negative C-reactive protein (CRP) level done pursuant to a screening latex test, a qualitative test which according to Professor Kirsten has a very high false negative rate. A blood sample taken at 09h00 on 16th January showed a white sell count of 22.8, a platelet count of 116 and a high CRP reading obtained by a quantitative test which is done by a machine as opposed to the latex screening test, and which is very accurate.

[18] From 11th January onwards the left arm becomes a cause of concern. On 12th January the nursing records show that the swelling of the arm has progressed up to the axilla. The arm is elevated. On 13th January there is blue discoloration of the arm but the swelling to the axilla seems to be less. The hand remains swollen but with good capillary refill. A successful start is made with breast-feeding (in the nursing notes it is observed, "Goed gesuig").

[19] At 9h00 on 14th January Dr Breytenbach refers the case to surgery. At 9h35 the baby is seen by the orthopaedic surgeons (Drs Bruere, La Grange, Le Grange and Moodley) who noted that there is an induration of the upper arm and swelling of the hand. Capillary refill was good. They queried an area of skin necrosis and indicated that they would continue to observe. A sample of interstitial fluid from the subcutaneous tissues of the left forearm was taken by needle aspiration. From the fluid, an enterobacter species was later isolated. Dr Bruere said in evidence that he observed the sample being taken and that it was done according to sterile protocols.

[20] At 21h25 on 14th January the nursing note states that the baby is pink and reacts well to stimulation. There are no signs or respiratory distress; saturation is 95%. The baby passes soft yellow stools and no blood present is in the stools or urine. The left arm and hand are still oedematous but the condition has improved and there is good capillary refill.

[21] By 14h30 on 15th January 2002 it is noted that the baby's condition is much improved although there is not much spontaneous movement. The baby cries when her left arm is touched and the left arm and hand are still swollen but fingers are less swollen and are warm and pink. On the left forearm there are blue patches with blisters ("blase"). It is further remarked that towards the axilla the arm seems to be more swollen and more painfull ("Verder na oksel lyk meer seer en meer geswel"). The patient's general condition is observed to be much better.

[22] By 23h10 on 15th January 2002 it is noted that the patient is pink, reacts to stimuli but does not move around much. The left arm is still

oedematous, hand and fingers are swollen but feel warm. The baby does not move her fingers. The vesicles were still present and the patient was sensitive to touch.

[23] On 16th January Dr Dhoodhat (who at the time was a community service doctor in the Department of Paediatrics) notes that the baby was very responsive and moving; that the left arm was swollen and discoloured, and that the bay was not moving the arm. Capillary refill was "very good". Dr Dhoodat makes the first query of a wrist drop (his note reads: "? Wrist drop"). At 8h45 on the same day, the baby is seen by the orthopaedic surgeons and in response to the query of wrist drop, they noted that the arm was neurovascularly intact. This visit by the orthopaedic surgeons and the decisions they took are considered in greater detail below in paragraph [57].

[24] At 14h20 on the 17th January it is noted that the left arm is still in an elevated position, that the hand is visibly less swollen and that the hand still appears blue. The blue patches on the arm show more blisters and the discoloration is more purplish. The swelling in the axillary area is less and the skin appears purplish. The impression is that pain to touch is less. It is further noted that the general condition of the bay is improving and that the left arm also shows improvement.

[25] From 18th January onwards general improvement of the arm and hand is recorded. Thus at 22h35 on 20th January it is recorded in the nursing notes:

> Left arm still be (*sic*) elevated. Upper arm less swollen, forearm still swollen but less, blisters still present. Hand and fingers feel warm. Good capillary filling. Arm shows improvement generally.

During the succeeding days, movement of the left arm is recorded but there is minimal movement of the fingers.

On 25th January a splint is applied to the left arm.

[26] On two occasions there are references to the left hand forming a "claw". At 10h30 on 27th January the nursing note states:

> Beweeg armpie maar nie vingertjies. Lyk na klou figuur.

At 13h45 on 29th January it is noted:

> Spalkie aan linker polsgewrig. Vingers maak klou vorm.

[27] On 29th January Dr Moodley notes that the skin on the left arm is blistered and desquamating. The baby moves the arm but there is no grasp reflex. On 31st January Dr Moodley notes the presence of necrotic skin on the left arm and further notes: "? radial nerve injury – wrist drop."

[28] On 1st February Dr Moodley again records necrotic skin on the left arm and the possible presence of left radial palsy manifesting with a wrist drop. She decides to discuss the possible discharge of the infant with Dr Bruere.

[29] On 29th January and 2nd February a physiotherapist, Mrs Ackerman, worked with the baby by way of passive movement of the left arm ("passiewe bewegings van die linkerarm"). Mrs Ackerman explained that what the treatment involved was movement by the physiotherapist of the baby's arm, which included the shoulder, elbow, pulse hand and fingers.

[30] At 13h20 on 2nd February the infant is seen by Dr Moodley and Dr Dippenaar. The decision is taken to discharge the baby, to be followed by a visit to the orthopaedic clinic within a week. The final nursing note reads as follows:

> Wiegieverpleging pienk en aktief. Abdomen sag, nie opgeset. Neem en behou voedings baie goed. Passeer urine en stoelgange. Linkerarmpie nog in spalk. Baba beweeg armpie met tye en met aanraking. Nog steeds ietwat sensitief met aanraking. Vingers pienk en voel warm, minimale beweging in vingers

The nursing note at discharge reads as follows:

> Vitale tekens binne normale perke. Velkleur pienk. Linker armpie in spalkie en voorligting gegee aan moeder ivm versorging. Neem en behou voedings goed.

[31] The baby is re-admitted to hospital on 7th February with multiple sores on the left arm and an observation is made of possible cellulitis and/or fasciitis. On 11th February the presence of cellulites was noted in the doctors' notes and in the nurses' notes of the same day, wound sepsis is recorded. On the same day it is noted that that the left hand is cold and without a pulse. On 14th February consent is sought for amputation but the mother insists on getting a second opinion. On 18th February the

infant is re-admitted and a left mid-arm amputation is performed on 19th February.

The plaintiff's cause of action

[32] The defendant admits that the doctors and medical staff employed at the George Hospital had an obligation to provide the plaintiff and the baby with medical advice, service and treatment with the skill, diligence and care reasonably required in the same or similar circumstances of hospitals, doctors and medical staff in their respective fields of specialisation with the requisite level of expertise and to do so in a manner which is not negligent. The defendant avers that on the admission of the plaintiff and her daughter Philasandre, the doctors and medical staff of the George Hospital had acted accordingly in providing medical services and related care.

[33] The plaintiff's Particulars of Claim were amended on several occasions, the last time during the course of the trial when it gave rise to considerable argument. In paragraph 13 of the Particulars of Claim as finally amended it is stated:

> 13. In breach of Defendant's obligations as set out above, health professionals in the employ of the Defendant but whose full and/or further particulars are unknown to Plaintiff, negligently between 11 January and 19 February 2002, *inter alia*:
>
> 13. 1 failed to consult with an experienced neonatologist at an early stage;
>
> 13.2 failed to ascertain whether arterial supply of the left arm had been compromised or not, by means of Doppler or other technology such as a pulse-oxymeter;
>
> 13.3 failed to ascertain the possible level of vascular occlusion by means of e.g. an arteriogram;

13.4 kept the arterial line m situ in the left arm, for more 10 hours without any anti-coagulant (between, some time before 04h20 on 11 January 2002 and 14h15 11 January 2002), exposing Philasandre to a high risk of thrombosis;

13.5 failed to initiate contralateral limb warming when vascular compromise was or should have been noted;

13.6 failed to consider and to perform a sympathetic cervical block;

13.7 failed to initiate anticoagulant or thrombolytic therapy at the appropriate time;

13.8 failed to treat Philasandre's arm with nitroglycerine application;

13.9 failed to timeously refer Philasandre to the surgical orthopaedic disciplines, or to an anaesthetist;

13. 10 failed to intervene surgically when it was appropriate to do so;

13. 11 failed to perform a fasciotomy;

13. 12 failed to debride necrotic tissue;

13.13 failed to perform explorative surgery;

13. 14 discharged Philasandre on 2 February 2002, despite evidence of the presence of a left-sided radial nerve palsy manifesting with a wrist drop, necrotic skin and a painful left arm, and at a time when it was therefore inappropriate to do so;

13.15 elevated Philasandre's left arm, and kept it elevated for some time, when it was inappropriate to do so.

[34] The fifteen grounds in respect of which it was contended that the doctors and medical staff at the George Hospital would be shown to have been negligent were all canvassed, in greater or lesser detail, during the course of the trial. Counsel for the plaintiff relied on but two of those grounds of negligence in argument at the end of the trial. These are:

1. A failure to operate on the baby's arm on or about 16th January 2002, in accordance with the allegations contained in sub-paragraphs 13.10 - 13.13 of the plaintiff's Amended Particulars of Claim.

2. The inappropriate discharge of the patient on 2nd February, 2002, as alleged in sub-paragraph 13.14 of the plaintiff's Amended Particulars of Claim.

[35] The plaintiff's case has during the course of the trial undergone considerable shift, and much of the evidence of the two experts called by the plaintiff has been effectively abandoned. The shift in the plaintiff's case will, to the extent that it may be relevant, be considered below when the remaining two grounds of negligence on which the plaintiff relies, are considered.

The issue of negligence

[36] It is well established that what is expected of a medical practitioner is the general level of skill and diligence possessed and exercised at the time by members of the branch of the profession to which he or she belongs.[1] The standard of care and skill required of a specialist is that of the reasonable specialist within the particular field of medical specialisation. In *Louwrens v Oldwage*[2] the Supreme Court of Appeal cited the following statement[3] with approval:

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[1] *Van Wyk v Lewis* 1924 AD 438 at 444; *Van der Walt v De Beer* 2005 (5) SA 151 (C) at 154H.

[2] 2006 (2) SA 161 (SCA) at 171C.

[3] From Claasen and Verschoor *Medical Negligence in South Africa* (1992) at 15.

> A specialist is required to employ a higher degree of care and skill concerning matters within the field of his speciality than a general practitioner. The objective 'reasonable physician test' is subjectified to the particular branch of medicine to which the specialist belongs. This means that it is expected from a specialist in the treatment of his patients to act as a reasonable specialist would have done under similar circumstances.

The test is expressed somewhat differently, but to the same effect, in *Bolam v Friern Hospital Management Committee*[4] in which McNair J, in instructing a jury, stated that –

> ..... the real question you have to make your minds up about ... is whether the defendants, in acting in the way they did, were acting in accordance with a practice of a competent body of professional opinion ..

and that a medical practitioner –

> ..... 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.

In estimating the level of skill and diligence possessed and exercised at the time by members of the branch of the profession to which a specialist belongs (the responsible body of medical men skilled in the particular art), "the evidence of qualified surgeons or physicians is of the greatest assistance".[5]

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[4] [1957] 2 All ER 118 (QBD); also reported at [1957] 1 WLR 582 and 1 BMLR 1. See further the remarks of Lord Scarman in *Maynard v West Midlands Regional Health Authority* [1984] 1 WLR 634 (HL) at 638.

[5] *Van Wyk v Lewis* 1924 AD 438 at 444

Expert evidence

[37] At the trial, each party adduced the evidence of eminently qualified experts. Professor Johan Smith, a specialist paediatrician and registered neonatologist at the Tygerberg Children's Hospital and associate professor in the Faculty of Health Sciences of the University of Stellenbosch, and Professor SW Moore, a specialist paediatric and general surgeon, Head of Paediatric Surgery at the Tygerberg Children's Hospital and professor of surgery in the Faculty of Health Sciences of the University of Stellenbosch, gave evidence for the plaintiff. The defendant adduced the expert evidence of Dr AN Numanoglu, a specialist paediatric surgeon attached to the Department of Paediatric Surgery at the Red Cross War Memorial Children's Hospital and senior lecturer in the University of Cape Town, of Dr MS Solomons, an orthopaedic surgeon and Head of the Groote Schuur Hospital Hand Unit and lecturer in the Department of Orthopaedic Surgery of the University of Cape Town, and of Professor GF Kirsten, a specialist paediatrician and registered neonatologist, principal specialist and head of the neonatal intensive care unit at the Tygerberg Children's Hospital and professor in the Department of Paediatrics and Child Health in the Faculty of Health Sciences of the University of Stellenbosch.[6]

[38] The experts expressed divergent and conflicting opinions. A meeting of the experts was arranged in an effort to resolve the differences. The experts reached agreement on a number of matters (a

[6] Professor Kirsten had been indirectly involved in the treatment of the baby to the extent that after the first and prior to the second exchange transfusion, Dr Breytenbach, a specialist paediatrician at the George Hospital, sought his advice. Apart from the telephonic advice, Professor Kirsten had no further involvement in the treatment of the baby.

minute of the meeting was placed before the Court as Exhibit "B"). However, on the issue of the cause of the left forearm tissue ischaemia they were unable to reach agreement. Professors Smith and Moore were of the opinion that the arterial line in the left radial artery and its management was the principal cause of the ischaemia. Dr Numanoglu was of the view that there is significant evidence that point to septicaemia as the underlying cause of the forearm ischaemia. Dr Solomons is unable to identity the pathogenesis and ultimate cause of the forearm ischaemia.

[39] Professor Kirsten, who was drawn into the fray much later, did not participate in the meeting of experts. By reason of the fact that the summary of Professor Kirsten's expert opinion under Rule 36(9)(b) was only filed on 20th November 2007, the fourteenth day of the trial, counsel agreed that his view that the limb symptomology is most consistent with deep vein thrombosis of the left arm[7], would not be canvassed at the trial. Professor Kirsten was of the opinion that the baby had an underlying infection, and his evidence in regard to the question of infection and other issues proved invaluable.

[40] In *Michael and Another v Linksfield Park Clinic (Pty) Ltd and Another*[8] it is emphasised –

> that the question of reasonableness and negligence is one for the Court itself to determine on the basis of various and often conflicting, expert opinions presented. As a rule that determination will not involve considerations of credibility but rather the examination of the opinions and the analysis of their

[7] Deep vein thrombosis may be due to congenital thrombophilia, or to an acquired factor such as, *inter alia*, an indwelling catheter or infection.

[8] 2001 (3) SA 1188 (SCA) at 1200D—E.

> essential reasoning, preparatory to the Court reaching its own conclusion on the issues raised.

An expert witness –

> ... must furnish criteria for testing the accuracy and objectivity of his or her conclusion. The Court must be told of the premises upon which the opinion is based.[9]

In evaluating the evidence of expert witnesses, the Court has "to determine whether and to what extent their opinions advanced are founded on logical reasoning".[10] It is further pointed out[11] that, in assessing the competing and contrasting evidence of scientific experts, it must be borne in mind that "expert scientific witnesses tend to assess likelihood in terms of scientific certainty". In *Ocean Accident and Guarantee Corporation Ltd v Koch*[12] Holmes JA stressed that in a civil case the degree of proof required in a Court of law is not "absolute science" but a balance of probability. This view found expression also in the judgment of the House of Lords in the Scottish case of *Dingley v The Chief Constable, Strathclyde Police*[13]:

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[9] *Holtzhauzen v Roodt* 1997 (4) SA 766 (W) at 773A. See also *S v Adams* 1983 (2) SA 577 (A) at 586C where Hoexter JA cites with approval a statement of Ramsbottom J in *R v Jacobs* 1940 TPD 142 to the effect that it is not possible to test the correctness of a expert's opinion so as to form a proper judgment upon it "unless the expert witness states the grounds upon which he bases his opinion."

[10] *Michael and Another v Linksfield Park Clinic (Pty) Ltd and Another* 2001 (3) SA 1188 (SCA) at 1200I.

[11] At 1201E.

[12] 1963 (4) SA 147 (A) at 159B.

[13] 2000 SC (HL) 77 at 89D—E.

> [o]ne cannot entirely discount the risk that by immersing himself in every detail and by looking deeply into the minds of the experts, a Judge may be seduced into a position where he applies to the expert evidence the standards which the expert himself will apply to the question whether a particular thesis has been proved or disproved – instead of assessing, as a Judge must do, where the balance of probabilities lies on a review of the whole of the evidence.

(The passage is cited with approval in *Michael and Another v Linksfield Park Clinic (Pty) Ltd and Another*[14]).

What is, therefore, required of a trial Judge in a civil matter is to determine to what extent the opinions advanced by the experts are founded on logical reasoning and how the competing sets of evidence stand in relation to one another, viewed in the light of the probabilities.[15]

[41] A case such as this, where the parties place before the Court the divergent opinions of distinguished experts, cannot therefore be decided by simple preference. In *Maynard v West Midlands Regional Health Authority*[16] Lord Scarman said:

> ..... I have to say that a judge's 'preference' for one body of distinguished professional opinion to another also professionally distinguished is not sufficient to establish negligence in a practitioner whose actions have received the seal of approval of those whose opinions, truthfully expressed, honestly held, were not preferred. ... For in the realm of diagnosis and treatment negligence is not established by preferring one respectable body of

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[14] 2001 (3) SA 1188 (SCA) at 1201G.

[15] *Louwrens v Oldwage* 2006 (2) SA 161 (SCA) at 175H.

[16] [1984] WLR 634 at 639.

> professional opinion to another. Failure to exercise the ordinary skill of a doctor (in the appropriate speciality, if he be a specialist) is necessary.

With reference to these words, Lord Browne-Wilkinson said in *Bolitho v City and Hackney Health Authority*[17]:

> The assessment of medical risks and benefits is a matter of clinical judgment which a judge would not normally be able to make without expert evidence. As the quotation from Lord Scarman makes clear, it would be wrong to allow such assessment to deteriorate into seeking to persuade the judge to prefer the one of two views both of which are capable of being logically supported. It is only where a judge can be satisfied that the body of expert opinion cannot be logically supported at all that such opinion will not provide the benchmark by reference to which the defendant's conduct falls to be assessed.

The Supreme Court of Appeal gave its stamp of approval to this approach in *Michael and Another v Linksfield Park Clinic (Pty) Ltd and Another*[18] and *Louwrens v Oldwage.*[19]

Other witnesses

[42] Some of the doctors and other medical staff who were involved in the treatment of the baby also gave evidence on behalf of the defendant. They were: Dr WFJ Bruere, a specialist orthopaedic surgeon who was head of orthopaedic surgery at the George Hospital at the time, and Drs WJJ Breytenbach and Dr HS Van der Walt, both specialist paediatricians. Sister LN Uithaler, who had been intimately involved in the treatment of

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[17] [1998] AC 232 (HL) at 243D.

[18] 2001 (3) SA 1188 (SCA) at 1201C.

[19] 2006 (2) SA 161 (SCA) at 175E—I.

the baby, and Mrs LC Ackerman, a physiotherapist, were also called to give evidence on behalf of the defendant.

[43] The three doctors, all specialists, were not called as experts and no expert summaries were filed on their behalf. Yet their expert knowledge as medical specialists cannot be ignored. After all, their conduct in the treatment of the baby is to be evaluated by the standard of care and skill required of the reasonable specialist within their respective fields of specialisation. The evidence they gave was therefore not purely factual: they gave evidence not only of the clinical facts they observed and of which they had personal knowledge, but also of their inferences from those facts and their conclusions as to the appropriate action in the circumstances. Thus both Dr Bruere and Dr Van der Walt stated in evidence that their observations of the clinical picture did not lead them to the inference that there was a compartment syndrome. In cross-examination, Professor Moore's hypothesis in regard to the existence of a compartment syndrome was canvassed with them and they were invited to state their opinions thereon.[20]

[44] The direct and credible evidence of a witness who has personal knowledge of the facts to which he or she testifies, generally carries great weight.[21] The opinions of the experts in this case are based upon inferences drawn from facts proved by the testimony and records of

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[20] This does not mean that I suggest that the evidence of these doctors must be treated as part of the expert evidence, as was apparently done in the trial court in *Maynard v West Midlands Regional Health Authority* [1984] 1 WLR 634 (HL). At 639 Lord Scarman remarks that "the judge recognised that the defence had called a formidable number of distinguished experts, among whom it was legitimate to include Dr Ross and Mr Stephenson themselves ....." The claim in that case was based on alleged negligence on the part of Dr Ross and Mr Stephenson in the treatment of the plaintiff.

[21] *Motor Vehicle Assurance Fund v Kenny* 1984 (4) SA 432 (E) at 436H, cited with approval by a Full Bench in *Stacey v Kent* 1995 (3) SA 344 (E) at 439A.

others. For this reason, the evidence tendered by the doctors and other medical staff who had been directly involved in the treatment of the baby should be carefully considered and accorded due weight in the face of the opinions of the experts, however experienced and eminent they may be.

The failure to operate on or about 16th January 2002

[45] The first of the two remaining grounds of negligence on which the plaintiff relies, is the alleged failure to operate on the baby's arm on or about 16th January 2002, in accordance with the allegations contained in sub-paragraphs 13.10 - 13.13 of the further amended particulars, being a failure to intervene surgically "when it was appropriate to do so"; a failure to perform a fasciotomy, a failure to debride necrotic tissue; and a failure to perform "explorative surgery".

[46] In argument, counsel for the plaintiff submitted that there was probably a compartment syndrome present in the baby's forearm from about 14th or 15th January, that the attending orthopaedic surgeons (in particular Dr Bruère) was aware of the symptoms indicative of a compartment syndrome, that a reasonable orthopaedic surgeon in his position would have intervened surgically on or about 16th January and that he was negligent in failing to do so.

[47] Compartment syndrome arises from swelling in the "compartment" formed by the sheet of fibrous tissue, the fascia, which envelopes a muscle. In the forearm the two major compartments are the extensor and flexor compartments. Prompt recognition and treatment of an acute compartment syndrome in a forearm compartment is necessary, for prolonged ischaemia can result in irreversible changes in the muscles,

nerves and vascular endothelium, leading to permanent disability of the and and wrist. Professor Moore explained that if –

> ..... for whatever cause, if you get swelling inside of those compartments you will get pressure on the artery, you'll get pressure on the nerves and that will increase. So any hint that there is a compartment syndrome, every surgeon knows that the most important thing to think about and to evaluate is to do a fasciotomy by which it means you just cut the skin, the underlying tissues and that fascia over the muscles, it releases the pressure and allows the blood to get in.

Dr Solomons pointed out that as a general rule, skin death or amputation is not a consequence of compartment syndrome.

[48] The contention that on or about 14th or 15th January there was a compartment syndrome present in the baby's forearm is not premised on the mechanism Professor Moore relied upon for his postulated compartment syndrome. Professor Moore's evidence was that the compartment syndrome was occasioned by a thrombus forming more or less at the site of the radial artery cannula, and that the thrombus then propagated itself proximally up the radial artery towards the bifurcation of the brachial artery, in the process compromising arterial supply to one or other of the compartments in the forearm. There was extensive debate in cross-examination as to the method by which it would be the flexor compartment (supplied principally by arteries arising from the ulnar artery with collateral supply from above the elbow) and not the extensor compartment (supplied by the radial network with an extensive collateral supply) that was initially affected, if the swelling noted did indeed have any relation to a compartment. The plaintiff no longer relies on the theory

propounded by Professor Moore, and it was conceded in argument that it was improbable that there was an arterial thrombosis,

[49] It was further conceded in argument that the most likely cause of the postulated compartment syndrome was probably septicaemia. In making this concession, the plaintiff effectively abandoned the evidence to the contrary of Professor Smith, and indeed also that of Professor Moore. The concession that there was an underlying infection present is well justified in the light of the evidence of Dr Numanoglu and that of Professor Kirsten. In response to an invitation to express a view as to the probability or otherwise of the baby undergoing some form of infective process, Professor Kirsten said:

> To my mind there is no doubt, there is overwhelming evidence, there is the clinical picture, the increase in the white blood cell count, a staphylococcus aureus that was cultured, a drop in the platelet count and then the eventual decrease in the C-reactive protein levels. I have no doubt that this baby had an underlying infection. I think the only problem there was that the first CRP level was done using the incorrect method and if at that time on the 13th they have used the other method it could have been a completely different impact in that it could have been higher and we would'nt have had this debate.[22]

[50] Mr Cloete found support in the evidence of Dr Numanoglu and Professor Moore for the submission that any compartment syndrome in this case might have been caused by septicaemia. In his report under Rule 36(9)(b) and in his evidence, Dr Numanoglu stated that the hospital records suggest that the ischaemic changes which occurred in the baby's arm were the result of bacterial septicaemia, and specifically, bacterial

[22] The blood test results that underlie this conclusion are set out above in paragraph [17].

endotoxaemia leading to endothelial damage, microthrombosis and haemorrhagic necrosis. In cross-examination, Dr Numanoglu agreed that the leaking of the fluid part of the blood outside the blood vessels and capillaries can increase the pressures within the compartments and can lead to compartment syndrome. Dr Numanoglu stated that the process is an uncommon phenomenon which has been the subject of a retrospective review of about 100 patients at the Red Cross War Memorial Hospital over a 28 year period from 1978 to 2000. Professor Moore agreed that –

> ..... the micro circulation gets involved and there is necrosis which causes swelling in the compartments and then the rest of the thing is fairly standard.

Having said that, Professor Moore immediately stresses that he does not believe that before the 16th January there was in this case evidence of bacterial septicaemia.

[51] On the question whether it was possible that septicaemia could lead to compartment syndrome, Dr Solomons said in evidence:

> Whether infection can cause a compartment syndrome or an infection of muscle and the arteries and nerves deep inside the forearm, I have never seen it, I have never heard about it, I have never read about it, but I'll defer to the opinion of the neonatologists and pediatrician surgeons. I wouldn't know whether that's possible, or not.

For the purposes of this case, it is not necessary to make a finding on the question whether septicaemia can cause compartment syndrome. What is of relevance in this case is, assuming that septicaemia can cause compartment syndrome, the question whether the septicaemia had in fact caused a compartment syndrome. In other words, were the clinical

features indicative of compartment syndrome present and, in particular, were they present before or on 16th January 2002?

[52] Dr Solomons emphasised that the diagnosis of acute compartment syndrome remains principally a clinical diagnosis. He agreed that –

> [t]he hallmark of diagnosis is a swollen, tense, and tender compartment that does not improve with elevation.[23]

Dr Solomons described the swelling as a wooden-like tenseness. An oedematous swelling, which is a subcutaneous swelling, is soft and spongy and not consistent with that of a compartment syndrome which is woody and hard.

[53] Another feature of acute compartment syndrome referred to in the literature and confirmed by Dr Numanoglu, Dr Solomons and Professor Kirsten, is pain. The pain caused by ischaemic muscle death in compartment syndrome is unremitting agony – in the words of Dr Solomons, "It's just unremitting, unrelenting, sheer agony". He agreed with the statement by Stevanovic and Sharpe[24] that the pain often causes a patient to have a progressively increasing narcotic requirement, and even with increasing pain medication, the pain is not relieved. Dr Solomon explained that the pain will go away after a time, the reason being that the pain fibres have been ischaemic for so long that they eventually die away.

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[23] Milan Stevanovic and Frances Sharpe "Management of Established Volkmann's Contracture of the Forearm in Children" (2006) 22 *Hand Clinics* 99-111 at 101.

[24] In the article cited in the preceding footnote at 101.

[54] Dr Solomons further pointed out that discolouration of the skin and blistering are atypical of compartment syndrome. He added that he had seen many, many compartment syndromes but –

> I have never seen or heard of a compartment syndrome presenting with skin lesions.

Stevanovic and Sharpe[25] do not include skin lesions in their "5 p's" of the diagnosis of compartment syndrome: pain, pain with passive motion, pallor, pulselessness, and pareshesia and paralysis.

[55] Dr Bruere examined the baby for the first time at approximately 09h25 on 14th January. At that stage there was swelling of the forearm and the hand, and extensive swelling with discoloration of the skin. There was an area of skin that was discoloured to such an extent that he thought it was threatening to become necrotic. There was also swelling on the inner aspect of the upper arm, extending up into the axilla. The swelling was a subcutaneous induration of tissue confined to the skin and the sub-skin tissue He established this on examination because these structures could be freely moved over the underlying muscles, which means that the swelling was outside the deep investing layer of fascia of the arm. The capillary filling was good. Dr Bruere was of the view that the swelling was caused by a subcutaneous infection of the limb, and his view was supported by the enterobacter bacteria cultured.[26] Dr Bruere said that at the time he saw the patient on 14th January, he found nothing in the baby's presenting symptoms that was compatible with a diagnosis of compartment syndrome in the baby's forearm.

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[25] In the article cited in the preceding footnote at 101.
[26] See paragraph [19] above.

[56] In regard to his awareness of compartment syndrome, Dr Bruere testified that he had "done orthopaedics" for 35 years and that –

> the first and foremost thing you do when you look at a swollen or injured limb is to establish the neuro-vascular status of that limb. That is the first thing you do. You feel for the pulses, you check for sensation, you check for movements, muscular function. If -- you make sure that the swelling does not involve a compartment. So you look for all the signs of compartment syndrome. It is fundamentally ingrained in any orthopaedic surgeon's mind. And anybody who does orthopaedic surgery thinks that way, especially in the circumstances of George Hospital, where you're dealing with large volumes of neglected trauma, neglected infections and that sort of thing

[57] Dr Bruere, along with Drs La Grange and Moodley, again see the baby at 08h45 on 16th January. In the nurse's notes, sister Uithaler recorded the following:

> Gesien deur Dr La Grange, Dr Bruere & Dr Moodley: Arm deeglik bestudeer. Bespiegel dat skade reeds gedoen is. Eerste gedeelte van voorarm? reeds nekroties is. Wil baba teater toe neem. Wil kyk wat onder aan gaan; Besluit weer om nog dop te hou vir 1 dag of twee. Hou ge-eleveer op druipsakkies. Nie sodat handjie hang nie. Baba oor algemeen baie beter. Indien ouers kom sal Dr La Grange met ouers wil praat indien hulle vrae het.

Sister Uithaler testified that she was not party to the discussion and that she merely wrote down her impressions of what she heard. Neither sister Uithaler nor Dr Bruere has any independent recollection of the discussion which had taken place between the orthopaedic surgeons. According to the note, the surgeons were in a quandary as to what exactly to do and whether an interventionist or conservative approach should be adopted.

Dr Bruere's said that the orthopaedic team usually did ward rounds together and what the note reflects, is the doctors in attendance debating the case among themselves. He added that the discussion of going to theatre was part of their debate, of their analysis of the case: at that point, there was no threat to the patient; the necrosis was not becoming more extensive and the baby was getting better and, indeed, breastfeeding. In other words, there was no point in opening up the arm and operating, especially in that they did not think there was compartment syndrome. In the end they decided that they were not going to go in, but that they would wait and see what happens.

[58] Dr Bruere said that he considered it bad practice to operate on compromised tissue "just because you want to have a look". Support for this view is found in the evidence of Dr Solomons who said that in the presence of both staphylococcus aureus and enterobacter organisms he would have counselled against surgical intervention. Dr Numanoglu drew attention to the further consideration that the baby's general condition would have to be taken into account as the child's condition needs to be fit for a general anaesthetic to be able to performance fasciotomy, otherwise one might be taking a greater risk by doing a fasciotomy on a sick child because of the anaesthetic complications.

[59] In the doctor's note pertaining to the visit of Drs Bruere, La Grange and Moodley on 16th January, Dr La Grange wrote "neurovascular intact". Dr Bruere said that the note was in response to the wrist drop query raised earlier that morning in the note of Dr Dhoodat and reflected the orthopaedic surgeons' assessment of the wrist drop situation, and the fact that they were confident that there was no compartment syndrome. Both Dr Bruere and Dr Solomons pointed out that wrist drop is not

caused by an extensor compartment syndrome, but by a problem to the nerve supply to the muscles higher up in the arm which control the movement of the wrist. Wrist drop, as repeatedly emphasized by Dr Solomons, and indeed also by Professor Moore, implies radial nerve palsy. This is also apparent from Dr Moodley's note on 31st January: "? radial nerve injury – wrist drop", and her note on 1st February: "radial n palsy → wrist drop". The causes of wrist drop are various and the presence of wrist drop may in a baby even be no more than an indication of pseudo-palsy, which is a self-protective mechanism against pain. Professor Kirsten said that wrist drop in a baby is often the result of an arm being stretched in delivery, a condition which heals in time. Dr Bruere was of the view that the wrist drop in the present case was most likely a temporary paresis resulting from the elevation of the baby's arm.

[60] Mr Cloete submitted that in view of the reduction of hand and finger movement noted on 15th January by the nurses and Dr Faber, and the wrist drop noted by Dr Dhoodat on 16th January, it is probable that compartment syndrome was present by 15th January. However, two salient features of compartment syndrome were not present. First, the tenseness or "hardness" of the swelling that characterises compartment syndrome was not noted by any of the nurses or doctors. Dr Van der Walt, who saw the baby late on the afternoon of Monday 14th January, remarked that the arm was more swollen that it had been when she previously saw the baby on the preceding Friday, but that "it was not a hard swollen arm"; it was not "rock hard swollen" in the manner she would associate with compartment syndrome. Secondly, the unrelenting pain that characterises compartment syndrome was not noted by any of the nurses or doctors. There are notes that the arm was sensitive to touch. Dr Bruere testified that pain of the arm to touch does not originate from

pressure in the compartment but is caused by inflammation around the nerves in the subcutaneous plane and is thus not an indication of compartment syndrome. Dr Solomons was of the view that an otherwise well neonate who had compartment syndrome would be extremely irritable, miserable and showing signs of extreme distress. Professor Kirsten said that if a baby has pain, it will "usually cry all the time". In fact, the general condition of the baby was improving over the period 12th to 15th January. At 08h00 on 13th January it is stated in the nursing note that the baby "lyk beter vandag", and in a note made at 13h10 it is stated, "baie beter". On the 14th it is noted, "Toestand toon verbetering sedert verlede week", and in a note made at 14h30 on the 15th it is stated, "Toestand baie beter". On 13th January a successful start is made with breast-feeding[27]; a fact which, as Mr Irish submitted, is hardly compatible with the insistent and unremitting agony which a compartment syndrome would cause.

[61] Though the first of the two remaining grounds of negligence on which the plaintiff relies is the alleged failure to operate on the baby's arm on or about 16th January 2002, Mr Cloete highlighted certain further clinical signs, indicative of compartment syndrome, which became manifest after 16th January. He referred to the Dr Solomon's concession that Dr Breytenbach evidence that the muscles in the baby's arm seemed to shrink in size, might be indicative of compartment syndrome. However, Dr Solomons added that Dr Breytenbach's observation that whole forearm was blue with a clear line of demarcation between the blueness and the rest of the forearm is not something you normally see in a compartment syndrome.

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[27] See above paragraph [18].

[62] Mr Cloete further referred to the entry in the nursing records on 25th January in which the arm was described as "voel styf en hard plek-plek en huil as armpie gebuig word", and the entry on 26th January, when it was noted that the arm was not swollen, that the arm "voel styf en hard". Dr Solomons conceded that the tenseness could be explained by compartment syndrome, though he found it difficult to understand, if the compartment syndrome had started (as the plaintiff alleges) way back on 16th January, why the arm would be painful at this stage.

[63] The third "classic sign" of compartment syndrome which Mr Cloete referred to is clawing of the hand. The first reference to clawing appears in a nursing note made at 10h30 on 27th January: "Lyk na klou figuur". At 13h45 on 29th January there is a note: "Spalkie aan linker polsgewrig. Vingers maak klou figuur". Dr Van der Walt said in evidence that there was clawing of the baby's hand on or after 27th January. In the notes of the orthopaedic staff there is no mention of clawing of the hand. Dr Moodley of the orthopaedic staff saw the baby on 31st January and again on 1st February, and on both occasions she noted a wrist drop.[28] Had there been clawing, she would surely have noticed and noted it. On 29th January and 2nd February the physiotherapist worked with the baby by way of passive movement of the left arm.[29] Mrs Ackerman said in cross-examination that if there had been a claw with characteristic stiffness of the muscles, she would not have been able to fulfil her task as a physiotherapist. Dr Bruere was sceptical about the nurse's observation of a claw, especially since the nurse's second observation was made after

[28] See paragraphs [27] and [28] above.

[29] See above paragraph [29].

a splint had been applied. A splint, he said, forces the fingers into a position resembling a claw, an observation also made by the physiotherapist. Dr Bruere said that he would have been "very" upset and worried if he had seen a claw in the child, but that he is confident that they did not miss a flexion contracture of the long flexes of the forearm.

[64] In my view, Dr Bruere and his orthopaedic team on the 14th and 16th January rejected compartment syndrome on reasonable grounds as a possible diagnosis. Their decision not to intervene surgically, either by way of a fasciotomy or by way of "explorative surgery", was in the circumstances reasonable and not negligent.

The discharge of the patient on 2nd February 2002

[65] The second of the two remaining grounds of negligence on which the plaintiff relies is the alleged inappropriate discharge of the baby on 2nd February 2002, as alleged in sub-paragraph 13.14 of the further amended particulars. The discharge is alleged to have been inappropriate by reason of the fact that at the time of discharge there was evidence of a left-sided radial nerve palsy manifesting with a wrist drop, necrotic skin and a painful left arm.

[66] Upon discharge, the left hand was still in a splint and the mother was instructed as to the care of the hand.[30] An appointment was made for further physiotherapy on 7th February. Dr Solomons confirmed that it is standard practice that any child with a wrist drop would get a splint and physiotherapy to maintain a passive range of motion.

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[30] The relevant nurse's note is cited in paragraph [30] above.

[67] When the baby was discharged it was no longer sick, it had recovered from the jaundice and the sepsis.[31] The baby had two small open wounds on her forearm in respect of which all signs of infection had cleared. Dr Bruere testified that he and Dr Dippenaar agreed that the baby was fit to be discharged:

> We thought the mother was responsible and caring and the child was healthy. It was feeling well. It had no temperature. The CRP was 5. There was no concern about the wounds on the arm, and we decided that it would be sensible to allow this child to go home and then come back for follow up the next week.

As to the state of the arm Dr Bruere said:

> Those (sores) were skin defects. I can't remember if the actual dead skin had come off, or if they were like scales sitting there, or scabs. I'm not sure about it, but I know that I was happy that there was no active infection or any threat to that arm coming from that ulceration.

As far as wrist drop is concerned, it has been pointed out above that the causes of wrist drop are various. Professor Kirsten pointed out that wrist drop in a baby is often the result of an arm being stretched in delivery (which is not the position in the present case), that it is a condition which heals in time and that there is nothing one can do in a hospital to speed it up. He stressed that "[w]rist drop on its own is not a contraindication to send a child home."

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[31] In cross-examination of Professor Kirsten, Mr Cloete put it to him that this was common cause.

When asked whether the baby was in pain at the time of discharge, Dr Bruere said that the baby looked healthy and fine, and was on the mother's arm. Professor Kirsten said that the sores, though healing, might have caused some residual pain which could have been controlled by an analgesic such as Panado syrup. He added that if a baby has pain, it will usually cry all the time. There is no indication that upon discharge the baby was distressed and crying. Upon discharge of the baby, Panado syrup was prescribed for use as needed.[32]

On the face of it, it would seem that there was on the 2nd February no indication that a further stay in hospital was required.

[68] Mr Cloete submitted that it is clear from the plaintiff's responses to the defendant's requests for particulars for trial that (i) it has always been then plaintiff's case that the negligence caused the amputation, and (ii) such negligence occurred during the whole period between 11th January 2002 and the date on which the arm was amputated, and that the plaintiff's amendment of the introductory paragraph of paragraph 13 of her Amended Particulars of Claim regarding the period of negligence had in fact been unnecessary. Mr Irish, on the other hand, contended that the plaintiff's case as pleaded was that the alleged inappropriate and negligent discharge of the baby only affected the level of the amputation of the baby's arm.

[69] In paragraph 7 of the defendant's request for further particulars for purposes of trial, the plaintiff was *inter alia* asked (i) what could or should have been done which could have avoided the amputation, and (ii)

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[32] The prescription says "Panado PRN".

when such should have been done. The response to the first question was that the treatment of the baby should have been managed with the requisite degree of skill and expertise, and that the relevant health care professional failed to do so in the respects set out in paragraph 13 of the plaintiff's particulars of claim. The response to the second question was:

> The negligence of the relevant health care professionals in the employ of the Defendant commences when the arterial line was kept *in situ* without anticoagulant from sometime before 04h20 on 11 January 2002 for a period of more than 10 hours, and continued thereafter until the arm was amputated.

In paragraph 16.7 of the defendant's request of further particulars for purposes of trial, the plaintiff was asked:

> On what basis does Plaintiff contend that Philasandre should not have been discharged at the time when she was discharged?"

The reply was as follows:

> Because Philasandre had a critically ischaemic limb when she was discharged. The loss of motor function in a critically ischaemic limb is of particular significance as loss of motor function heralds impending muscle necrosis.

In response to a further question, the plaintiff stated:

> The Defendant's employees, by discharging Philasandre with a critically ischaemic limb, failed to exercise the general level of skill and diligence possessed and exercised by members of the branch of the profession to which they belong.

[70] In regard to the effect, or result of the discharge of the baby on 2nd February, the following case was made in the evidence adduced on behalf of the plaintiff at the trial. In the summary of Professor Smith's expert opinion filed under Rule 36(9)(b) in which it is stated:

> Earlier intervention could probably have prevented the development of cellulites and therefore limited the extent of the amputation.

In his evidence in chief, Professor Smith confirmed this view and stated:

> In my view the discharge from hospital was not indicated and represents sub-optimal clinical practice. Earlier, in my view, earlier intervention could probably have prevented the development of cellulitis which we will get to later on and therefore could have limited the extent of the amputation.

He added that the fact that the baby was inappropriately discharged –

> ..... is also borne out by the fact that the infant developed cellulitis and that it would not and should not have occurred if the infant was in hospital.

Professor Smith explains this statement as follows:

> Cellulitis in the situation probably occurred due to neglect after the infant was sent home[33] ..... With inappropriate management and as a consequence of developing progressive poor blood flow to the tissues the infant became more and more prone to secondary infection.

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[33] The fact that something might have happened after the baby had been sent home was also alluded to by Professor Moore. The issue was, however, not further explored at the trial.

Professor Smith was then asked whether it is correct that on the day of discharge there was not evidence in the hospital records of cellulitis. His response was, "It appears like that yes."

[71] Professor Moore in his evidence explicitly confirmed the following statement is the summary of his expert opinion filed under Rule 36(9)(b):

> It is my opinion that the discharge of the patient with a critically ischaemic arm had an influence on the eventual outcome and was probably responsible for the fact that the amputation had to be revised at a higher level than the initial amputation level.

In evidence he elaborated on this point of view by stating that –

> ..... I felt that by not dealing with the problem when there was a claw hand, when there was sepsis, severe sepsis, by discharging the patient home to whatever bugs there might be there to improve on I suppose, and delay the amputation it increased the level of sepsis and led to the fact that it could'nt be just a dry gangrene which could just be cut off and one a nice, clean surgical closure; it had to be a stage procedure which involved further surgery, two further operations to get it closed which included shortening the bone so that the muscles could cover it and left the child with a relatively short arm.Now that's the only point I wanted to make from it and a did'nt criticise the actual amputation and looking at the picture, it's not a bad result.

[72] The evidence of Professor Moore calls for two preliminary observations. First, there is no evidence in the hospital records or other testimony placed before the Court, that the baby was discharged "with a critically ischaemic arm". On the contrary, on 11th February, the fourth day after re-admission, the orthopaedic surgeons note that the edges of the ulcers on the baby's left arm are "granulating well". As Dr

Numanoglu pointed out, granulation is part of the healing process and incompatible with an inadequate blood supply to the affected areas.

[73] The second preliminary observation relates to Professor Moore's contention that the delay of the amputation increased the level of sepsis and led to the fact that there was not merely a dry gangrene which could be excised in one, clean surgical closure, and that it had to be a staged procedure which involved further surgery. This is not borne out by the evidence of Dr Bruere and the contemporary hospital note – Dr Bruere in doing the amputation found dry gangrene without any sign of suppurating or infected wet gangrene.

[74] The plaintiff's case as made out in the evidence of Professors Smith and Moore is that if surgical intervention had taken place earlier (before the discharge of the baby), the eventual outcome might have been amputation at a lower level. This has consistently been their attitude throughout. Thus in the notes dated 19th October 2006 of the meeting of experts, it is recorded that Professors Smith and Moore were of the opinion that the timing of the discharge from hospital was inappropriate as "it may have affected the level of amputation". At the meeting of experts, Dr Numanoglu agreed that the discharge on 2nd February was inappropriate, but was of the view that it did not make any difference "to the outcome / level of amputation".

[75] Dr Numanoglu's view in regard to the discharge of the baby was that the baby had been very ill, that she was more vulnerable to further setbacks, that she still had skin lesions on her arm, and that one would like to see that the ulcers had healed before discharge, or were closing or almost closed. In response to a question in cross-examination whether the

deterioration that took place between 2nd February (discharge) and 7th February (re-admission) would have taken place if the baby had remained in hospital, Dr Numanoglu said, "It's difficult to say". Elsewehere in his evidence he said:

> If you just look at the wound itself, which is under control and with regards to the sepsis, one can follow it up. One can follow the patient in an outpatient setting or even a day hospital setting. If you just look at the wound and the treatment of the wound.

This approach is supported by Professor Kirsten who said that the decision whether or not to discharge a child with necrotic skin on a forearm would be one within the domain of surgeons and orthopaedic surgeons who deal with many babies on an outpatient basis, and –

> They know in which ones they can close the wound or wounds, send the mother and baby home, and then reassess because it is a slow healing process.

[76] Dr Bruere, who had examined the baby prior to discharge, was of the opinion that there was no active infection or any infective threat to the arm. In my view, his decision to discharge the baby with follow up at the orthopaedic clinic was in accordance with accepted practice and cannot be faulted.

Causation

[77] Mr Cloete submitted that a causal link exists between the failure to intervene surgically on or about 16th January 2002 and the eventual amputation of the baby's arm. The contention is that had a fasciotomy been performed on the baby's forearm on or about 16th January, it is

improbable that she would have been discharged from hospital on 2nd February. The discharge from hospital on 2nd February and the consequences thereof (infection) caused the eventual amputation of the arm on 19th February: had she not been discharged on 2nd February (which would probably been the case if she had undergone a fasciotomy on or about 16th January 2002) her arm would not have become infected and would probably not have been amputated.

[78] In developing the argument of a causal link, Mr Cloete placed considerable reliance on the evidence of Dr Numanoglu and Dr Solomons that the baby's high temperature upon re-admission on 7th February might have been indicative of sepsis, and Dr Numanoglu's concession that it is probable that the arm became infected between discharge on 2nd February and re-admission on 7th February. Dr Bruere and Dr Solomons agreed that it was less likely that the arm would have become infected had the baby remained in hospital, and if did happen in hospital it would immediately have been treated appropriately. Dr Numanoglu said that the further deterioration of the arm between re-admission on 7th February and 11th February, when the presence of cellulites and the absence of a radial pulse, could have been due to the escalation of the infection, though he did not exclude other possibilities.

[79] The existence of such a causal link is premised on the necessity of surgical intervention on or about 16th January. If there had been no necessity to intervene surgically at the time, the absence of surgical intervention cannot be a cause of the eventual amputation. It has been held above that there is no merit in the first of the two remaining grounds of negligence on which the plaintiff relies; namely, the alleged failure to operate on the baby's arm on or about 16th January.

[80] Moreover, it has further been held above that the discharge of the baby on 2nd February was not inappropriate and not negligent. If there was no wrongful conduct, there can be no legal liability.

Conclusion

[79] The plaintiff has not established negligence on the part of the defendant's employees on the two remaining grounds relied on at the end of the trial. The claim must accordingly be dismissed.

[80] There is no reason why costs should not follow the result, such costs to include the costs consequent upon the employment of two counsel. The defendant is also entitled to the qualifying costs of the expert witnesses, Dr AN Numanoglu, Dr MS Solomons and Professor GF Kirsten, and the costs incurred in bringing to Cape Town, Dr WFJ Bruere, Dr WJJ Breytenbach, Dr HS Van der Walt, Sister LN Uithaler and Mrs LC Ackerman.

[81] The following orders are made:

1. The plaintiff's claim is dismissed with costs including the costs consequent upon the employment of two counsel.

2. The plaintiff must pay the qualifying costs of the expert witnesses, Dr AN Numanoglu, Dr MS Solomons and Professor GF Kirsten.

3. The plaintiff must pay the costs incurred in bringing to Cape Town, Dr WFJ Bruere, Dr WJJ Breytenbach, Dr HS Van der Walt, Sister LN Uithaler and Mrs LC Ackerman.

HJ ERASMUS, J