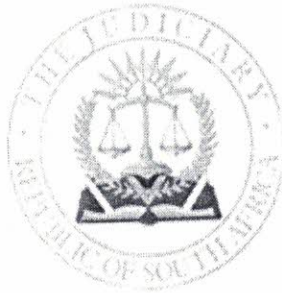


IN THE REPUBLIC OF SOUTH AFRICA


 IN THE HIGH COURT OF SOUTH AFRICA
 (GAUTENG DIVISION, PRETORIA)

CASE NO: 69864/2013

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|-----|---|
| (1) | REPORTABLE: NO |
| (2) | OF INTEREST TO OTHER JUDGES: NO |
| (3) | REVISED. |
| (4) | SIGNATURE <i>[Signature]</i> 25/04/2019 |

LOUISE CHARLOTTE EVANS

PLAINTIFF

And

 DRS S DARKLING, AS PARKING & M EYBERS t/a LIFE WILGEHEUWEL
 ACCIDENT UNIT & EMERGENCY UNIT

FIRST DEFENDANT

DR CLAIRE ANN SIM

SECOND DEFENDANT

DR NOKWAZI NOKWANDA NDLELA

THIRD DEFENDANT

 JUDGMENT

N V KHUMALO J

[1] This is an action instituted by a 43 year old Ms Louise Charlotte Evans ("Evans" or "the Plaintiff"), against Life Wilgeheuwel Hospital Accident and Emergency Unit ("the Unit"), the 1st Defendant, and Drs C A Sim and N N Ndlela, the 2nd and 3rd Defendant respectively, claiming for damages she alleges to have suffered as a result of the negligent conduct of Drs Sim and Ndlela when they treated her at the Unit after she suffered a stroke. (Drs Sim and

Ndlela referred to as "Sim" and "Ndlela" and to Plaintiff as "Evans," for purpose of convenience).

Background Facts

[2] On 5 October 2011, Evans experienced a sudden numbness of her left arm and left leg. She had apparently suffered a stroke / cerebrovascular accident. She was rushed to the Unit where she was admitted for treatment. Sim was immediately assigned to treat her and was later relieved by Ndlela who soon afterwards discharged Evans without a definite diagnosis. Neither Sim or Ndlovu afforded her the treatment or referred her to a specialist or to a specialised hospital for the stroke. Both doctors are independently contracted to the Hospital.

[3] Evans had presented herself following the sudden numbness on 5 October 2011 at the Hospital at 11:03. The Defendants examined her, thereafter ordered blood tests and a CT scan to be performed. The scan was allegedly done at 12:24 and reported as a normal, non-contrast brain examination, recommending a MRI if the symptoms persisted. A toxicology screen was also performed.

[4] Evans was discharged with a final diagnosis of "numbness of left side of the body" and instructed to go home. She instead obtained a second opinion from one Dr Naidoo ("Naidoo"), her family physician. Naidoo recognized the stroke symptoms and referred her to Dr Le Roux, a specialist physician back at Life Welgeheuwel Hospital. Le Roux referred her to Dr Shamley, a neurologist at Wits University, Donald Gordon Medical Centre ("DGMU").

[5] At DMGU, Shamley performed MRI investigation which showed **a dissection of the right vertebral artery with an infarct in the lower part of the medulla and upper spinal cord.** On 17 October 2011 she was transferred to Life Riverfield Rehabilitation Centre under the care of Dr K Mon until her discharge on the 1st December 2011.

[6] Evans is presently debilitated in various aspects as a result of the stroke, hence suing the Defendants for the said *sequelae*. The Unit is sued on the basis that she orally contracted with it that against remuneration she would be examined, diagnosed and treated with the degree of care, skill and diligence that may reasonably be expected of a hospital and an emergency unit and its employees, specifically the emergency and nursing staff and would provide professional hospital facilities and services.

[7] Alternatively that, by examining her as a patient, the Unit assumed the legal duty of care towards her and other ancillary duties associated with it. The action against the Unit was subsequently withdrawn. Reference to Defendants is only to Sim and Ndlovu.

[8] Sim and Ndlela were sued on the basis that:

[8.1] they entered **into an oral agreement** with Evans that they would examine, diagnose, advise, where applicable treat her in respect of a sudden onset of numbness of her left arm and left leg, for reward, which treatment also included the performance of diagnostic tests and or referral to a specialist and generally perform their obligations with such skill, care and diligence as could reasonably be expected of a general practitioner in similar circumstances, a doctor /patient relationship having come into being. **Both Defendants had also a legal duty to comply with these obligations.**

[8.2] They **negligently breached the mentioned agreement or the legal duty in that they failed:**

[8.2.1] to diagnose her with a stroke timeously, alternatively at all, despite Plaintiff's stroke-like sensory symptoms of the numbness and tingling down on one side of her body;

[8.2.2] to treat her stroke timeously, alternatively at all, with thrombolytic agents;

[8.2.3] to admit her to hospital and or to refer her to a specialist for further management;

[8.2.4] to evaluate her for thrombolytic therapy;

[8.2.5] to give her full and proper treatment, given her symptoms of numbness;

[8.2.6] to examine, advise, diagnose and treat her with the skill, care and diligence reasonably required for a general practitioner.

[9] As **a result** of their breach of the mentioned agreements and of the mentioned legal duties;

[9.1] Evans suffered significant damages resultant from the stroke/cerebrovascular accident that **could have been prevented or alternatively limited; and**

[10.2] experienced and will continue to experience pain and suffering, a loss of amenities, loss of income and incurred medical expenses and will in future incur medical expenses.

[10] Evans therefore alleges to have suffered damages in the amount of R8 607, 069.99, inclusive of all the aforementioned damages for which Sim and Ndlovu are to be jointly and severally liable.

[11] The Unit had in its Plea admitted that on admission Evans entered into an oral agreement with the Hospital's authorized employee that whilst she would pay the Unit's agreed, alternative usual charges for the services rendered, the Unit will ensure that she is attended to by a casualty physician within a reasonable time, facilitate the appointment of a clinical physician to attend to her, perform certain administrative functions in capturing Evans's details and ensure that clinical physicians were aware of the processes pursued for continuing alternatively follow-up patients.

[12] According to the Unit, the obligations were discharged. It provided the Plaintiff with clinical physicians, Sim and Ndlela, to perform the relevant examinations, who at the time were acting independently as duly appointed independent consultants of the Hospital. The Doctors directed that a CT scan be performed and Evans was released from its care pursuant to receipt of the CT scan report conducted by an independent medical specialist that indicated

a normal non-contrast brain examination. The nursing staff who provided nursing services to Evans were not employed by the Unit.

[13] Furthermore, the Unit alleged to have rendered care in accordance with a reasonable standard expected of a general practitioner and discharged its onus in terms of the oral contract. Any further liability was therefore denied or that the failure to diagnose exacerbated the alleged damages suffered by Evans.

Re: The 2nd and 3rd Defendant

[14] In their Plea, Sim and Ndlovu admit that they were contracted by the Unit to render accident and emergency services at the Hospital and that they had a legal duty towards Evans to provide such medical care and treatment as reasonably expected of a casualty medical practitioner and emergency unit.

[15] Sim further admits to have examined Evans and ordered the blood tests and a CT scan to be performed. The CT scan reported that there appeared **normal non-contrast brain** examination (there was **no bleeding in the brain**) and recommended that if the symptoms persisted or worsened, an MRI brain scan be done. Also that a toxicology screen was performed.

[16] She however denies that she discharged Evans, or had a final diagnosis of her ailment as “numbness of the left side of the body” or that she had instructed Evans to go home. **Whilst** Ndlela denies that she examined Evans on admission or that she had ordered blood tests and a CT scan to be performed.

[17] Both Sim and Ndlela concede to not diagnosing Evans with a stroke or treating or evaluating her for treatment with thrombolytic agents, admitting her to Hospital or referring her to a specialist for further management. However they deny being under any legal obligation to pay the amount that is claimed by Evans.

[18] At the pretrial conference held before the commencement of the trial, the parties agreed that:

[18.1] Sim and Ndlela will not be contesting Evans’s allegations of negligent breach of their legal duty towards her. However they persisted in their denial that a contractual relationship exist between them and Evans.

[18.2] Evans was requested to furnish the Defendants with full particulars or precise details or detailed description of the “significant damages” (with reference also to the clinical or physical manifestation of such damages – hereinafter “*sequelae*”) which she allegedly suffered as a result of the stroke/cardiovascular accident that are alleged to have been caused by Sim and Ndlovu’s breach, **that could have been prevented and or limited had it not been for the breach on their part.**

[19] Evans subsequent withdrawal of the action against the Unit was noted.

[20] At the commencement of the trial, the parties confirmed that Sim and Ndlovu, had **conceded the question of a wrongful and negligent breach of a legal duty they owed to Evans** insofar as their treatment of Evans is concerned as reflected in their plea. On the other hand Evans waived her reliance on a contractual breach.

[21] Sim and Ndlovu however persisted with their denial that Evans' *sequelae* (the present debilitation that Evans exhibits) is consequent to their admitted wrongful and negligence / breach of their legal duty.

[22] As a result the issue that arises as far as the question of liability is concerned, is that of **causality (both factual and legal)**, specifically whether a **causal link (connection) as required by law** exists between Sim and Ndlovu's admitted **breach of their legal duty** and Evans' **pleaded sequelae**, rendering both liable for Evans' pleaded resultant damages. What is to be established is if Evans suffered any of her pleaded *sequelae* and consequential damages as a result of either of the doctors' negligence.

[23] Contrary to the norm both parties presented a lengthy opening address, arguing on the divergent views they held on how and what Evans needed to establish to prove causality and her alleged *sequelae*. Subsequent thereto they had reached an agreement in respect of separation of the issue of liability from that of damages (prove thereof and quantification). They sought an order accordingly and for a postponement of the latter for later adjudication. The agreement was presented to the court as a draft order incorporating a clarification on the outstanding element of liability after Sim and Ndlovu's admitted liability of wrongful and negligent breach of their legal duty. It was stated to be whether or not Sim and Ndlovu's admitted negligent breach of their **legal duty** was **both factually and legally, causally connected to any of Evans' sequelae, that is, her apparent debilitation** when Evans condition is compared with her pre- stroke condition.

[24] Being satisfied of the order as per draft, I accordingly made the draft an order of court. The debilitation referred to was still not detailed in the particulars of claim. The separation did not however exonerate the Plaintiff from establishing and or indicating clearly what constitutes the actual harm or *sequelae* alleged to have resulted from the Defendant's negligent conduct.

[25] According to Mr Potgieter, Evans legal representative, the case Evans was to present to court, was summarily that it is more probable than not that she would have had a more favourable outcome of her stroke had the Doctors correctly diagnosed her situation, and accordingly applied the applicable treatment for the stroke she suffered. It was submitted that Evans relies thereon based on the fact that according to the Constitutional Court case of *Lee v Minister of Correctional Services* 2013 (2) SA 144 (CC), the "but-for" test which is traditionally applied is no longer applicable in the traditional manner in cases of this nature.

[26] The parties proceeded to argue raising a concern about the outcomes that are referred to had there been timeous treatment. Mr Le Grange who appeared on behalf of Drs Sim and Ndlovu queried that anybody can say with certainty, that she/he would have been one of those fortunate people who have no results if she been treated timeously with the thrombolytic therapy, basing their case upon a **more favourable outcome**. It span the **whole possibility of no negative results to improved outcome, but indicated that according to the**

experts, still some negative results in, even if one treated. He indicated that reliance is going to be on the international research literature pertaining to the percentage of cases in which one obtains a more favourable outcome if a correct diagnosis is made timeously and appropriate treatment applied timeously. The question that arises is whether the research results revealed will suffice to hold Sim and Ndlovu liable in law for their admitted wrongful and negligent breach of their duty?

[27] Mr Potgieter, instead projected that, the Drs contention that Evans cannot prove, on a balance of probabilities, that had she on presentation at the hospital been properly diagnosed and treated, her *sequelae* would have been improved was based on a mathematical/arithmetical approach. Le Grange argued that even if the diagnosis was performed and the treatment given, international research point to the fact that this did not always result in a favourable outcome. Arguing unfavourable odds.

[28] It became clearer though that Evans is pursuing a more favourable result, however still not abandoning the possibility that she would have had no *sequelae*, therefore would have been normal, as one of the possibilities that research has indicated can occur, if she has been treated timeously. **Whereupon she was to show that the debilitation after the stroke could have been arrested with total recovery but for the negligent omission.** In simple terms Evans' case would then be that if they had diagnosed and had treated her or transferred her to a specialist with whatever or any of the treatment timeously, she would have ended up with no debilitation or cabbed its extent.

Issues arising

[29] The parties are agreed that there was no proper diagnosis, that Sim and Ndlovu were negligent when they failed to diagnose Evans's stroke and also to refer Evans to a specialist for the administration of the stroke treatment and or transfer her. Causation however will not always follow whenever a wrongful and negligent omission is shown. Each Defendant's wrongful and negligent omission should be proven to be causally connected both factually and legally to any of Evans' pleaded *sequelae*/ damages. It has to be proven that the **failure to diagnose and to refer or treat the stroke was the cause of the extent of Evans debilitation which she alleges could have been totally avoided or limited.**

[30] The question therefore is if **on presentation at the hospital she had been properly diagnosed and referred to a Specialist**, would that have resulted in the avoidance of the event that caused her debilitation. This is where Evans' argument for a favorable outcome resides. Sim and Ndlovu **dispute the assertion** relying on the **international research literature pertaining to the percentage of cases in which one obtains a more favourable outcome if a correct diagnosis is made timeously and appropriate treatment applied timeously.**

[31] The parties submitted that **there was no real dispute as to what the international literature on research reveals. What is in dispute is whether or not the research results suffice to hold the Drs liable in law (legally) to their admitted breach of their legal duty.**

[32] Evidence is therefore to be established that supports both the cause in fact and in law. (immediate cause). Evans was therefore required to establish facts of the causal connection

between the mal- or lack of treatment and her sequelae and that on a balance of probability the medical outcome she now displays, would have been (better) improved or avoided had the Drs not committed the breach. The parties agreed that as Evans carried the onus of proof, she had a duty to begin.

Factual Evidence (on behalf of Plaintiff)

[33] Evans testified on her behalf. She also led the evidence of Mr Evans, her husband and Nadine Nunan, her business/partner friend who drove her to the Emergency Unit after she experienced the symptomatic discomfort, including that of two Experts, Dr Kasler, a neurologist, and Dr Van Niekerk, a statistician to support her case. On behalf of the Defendants evidence was led by Dr Rosman, a neurologist.

[34] Evans was **37 years old on 5 October 2011** when she suffered a stroke. According to her, at the time she did not suffer from any ailment, nor did she have a history of trauma. She was not on a hormone replacement therapy and generally was of good health. She on occasions over weekends consumed alcohol and was a mild smoker.

[35] On the day of the incident she was at work where she ran a **beauty therapist business** she owned with her friend Nadine Nunan ("Nadine"). She had a scheduled appointment with a client at 10h30 and had arrived at work at 9 o'clock. Nearer to the time of her appointment **she suddenly sensed some numbness in her left arm. She thought she was having pins and needles when the** same numbness extended to her left leg. She tried to walk to go and lie down in the beauty room, but fell over against the wall. Her left leg could not support her weight. She got up and climbed on the bed. She was scared and phoned her friend Nadine, an ex- nurse to tell her how she was feeling. Whilst she was **talking to Nadine she felt her face starting to feel numb as well and was struggling to hold a sentence**, stuttering. Nadine immediately became aware that she was having a stroke and told her that she was on her way to her. Nadine arrived after the arrival of her client. She with the help of the client put her on the beauty salon chair and wheeled her to Nadine's car. Nadine drove her to the Wilgeheuwel, Emergency Unit. They found Mr Evans, her husband already there.

[36] She said she remembered vaguely what happened at the hospital. She remembered her husband telling her she is in the best place. The next thing she remembers is that she was given a pill, she got sick and vomited. She afterwards was pushed into a machine. Her body could not lay still, her left arm and leg were jumping. They put earphones on her and told her to keep still. **They also put something under her tongue, later told her that there was nothing wrong with her, her husband can take her home. The next thing she also remembered was being at Le Roux's surgery at Wilgeheuwel.** Le Roux scraped something down her feet and that was the last thing she said she remembered. She woke up at Donald Gordon on the Friday since Wednesday.

[37] She confirmed being a **gymnast and a dancer** when she was younger and prior the stroke to have been able to run and play with her kids, which was now different. Presently, 6 years after the stroke, her **left arm has no use at all, she cannot run, walk without a brace. It goes under her shoe, up her leg and stops at her ankle**, because her foot drops. She fell a

couple of times, in the shower and slipped a couple of times in a moon boot therefore uses a crutch as she still struggles to balance.

[38] Since the stroke she has not continued her craft as a beautician as she needs both hands for that. She has rather worked as a receptionist, using headphones. She said her speech is ok but gets a little bit blurry when she is tired. Also she could not get her words out properly when she wakes up in the morning which lasted until the third week of November 2011. She pointed out that she is on chronic medication taking cholesterol pills and Baclofen that stops her muscles from going into spasm, blood thinners called Ecotrin and antidepressants. She also takes something that protects her stomach lining from all the other pills and trepiline that stops her from getting dizzy since they said the back of her neck gets tight and makes her dizzy. She used to drive and had stopped since the stroke.

[39] Under cross examination she admitted having a headache that morning. She denied however that she was prone to headaches and that the headache was something extra ordinary, saying it was not severe or something to worry about. She admitted being told that her stroke was caused by a posterior vertebral arterial dissection which is a problem that started at the back of her neck causing a medulla oblongata stroke which start from the neck leading to the brain. She then confirmed that she did suffer headaches at the time before the stroke set in. She denied taking any chronic medication or any medication that morning before the incident as far as she can remember. It was pointed out that on the patient clinical record, the information completed was about the number of headaches she has suffered and the numbness on the left side of her body, feeling pins and needles and a headache since two weeks prior the incident, coughing for 7 days and allergic to penicillin. She denied giving the information to the nurses but confirmed that she is allergic to penicillin. She confirmed the information of being an asthma sufferer but only as a child. Agreed that she took Panado, Compral and Disprin at 7h30 that morning 12 hours pre admission. She denied giving any information to the nurses, alleging that at the time she could not speak. Although chronic medication Vertigo was noted she said it is her husband who was on Vertigo. She confirmed to having a left knee operation when she was 16 years old. Her last meal the previous night to have been at 18h30. She pointed out that she probably would have had breakfast that morning with a cup of coffee but could not remember. She denied suffering from headaches for the past 2 weeks. She could not remember taking the headache tablets and she would not have taken three kinds of medicine at the same time that morning.

[40] It was pointed to her that in Dr Naidoo's notes whom she visited after being discharged at the Emergency Unit it is recorded that she suffered from headaches for 2 weeks out of 52 which indicate that she suffered headaches for the past 2 weeks taking Comprals. She said she would not have told Dr Naidoo that she is taking Comprals as she could not speak when they got there and what Naidoo wrote on his note that "she was experiencing diminishing power on the left hand side and twitching might have been communicated by her husband. She said she remembers being there and not how she got there or left. Responding to a question if she had told her husband about the headache, she said she did not know that her headaches were something to worry about. She said she could not remember if she took medication that morning and if she had a headache at all she would have taken a Panado. They do not buy Compral for headache pills. She denied ever bumping her head or falling awkwardly in any period prior to 5 October 2011.

[41] She confirmed that she got to the hair salon before 9h00, and it was whilst waiting for her appointment, around **10h10 - 10h30** that she started experiencing the numbness. She also **confirmed that she might have said to Dr Roper that she started experiencing the numbness around 10h00**. She continued to say it was actually around **10h00 and 10h15**. Dr Corie van Zyl had also noted in his report that she told him that she had symptoms of numbness at about 10h00, she however disagreed that she would have said that. She also said she would not have said what **Dr Campbell a Neurologist** had noted that at around **10h00** in the morning she started experiencing numbness on her left hand side and slurred speech. She said it was around 10h15 because her client had arrived at the time whose appointment was at 10h30. It was put to her that Dr Botha is the only one who noted that the symptoms onset was at 10h15. Dr Kasler has reported that it was 10h25. She indicated that she could not have said a specific actual time because she did not know exactly what time it was.

[42] According to Evans it **was within 5 minutes that the symptoms became a sign that she could not walk**. There was nobody to assist her, the hair saloon lady was busy in the hair salon and she was in another room, the beauty room was unoccupied. Nadine who does not stay that far from the hair salon took just between **5 and 10 minutes** to be there. On Nadine's arrival, the client was already there. The client helped Nadine to put her on the chair and wheel her to the car. The Emergency Unit was 10 to 15 minutes away. When they arrived her husband was there. Nadine phoned him before she got to her. Mr Evans **saw to the administrative side of things as she was taken to the Emergency Unit**. She confirmed the time on the file was 11;03 and then it had recorded her arrival time as 11h10 on a wheelchair, she could not remember who put her on the wheel chair there but she was with Nadine and her husband. It was noted that the triage took 2 minutes from 11h10 – 11h12, and recorded as showing a heart rate and blood pressure and temperature. **The AVPU that indicates alertness recorded that she was alert, with no trauma and with mobility**. But she could not remember that. It was put to her on the medication she was using that Venteze is for asthma and Vertise is for vertigo and she said she has never had vertigo but her husband had, but he was not on chronic medication and does not recall the name of the medicine that he used to take.

[43] The last meal she had was noted to have been at 18h30 the previous day. She then had coffee that morning talking to the person at the hairsalon. On Dr Sim's report it states that she suffered the numbness 30 minutes ago when she was seen by her at 11h15. She denied having spoken to Dr Sim. It was put to her that the doctor's examination results were that she was stable, vitals normal, chest clear, there was nothing wrong with CVS Central Vascular System and abdomen. The CNS Central Nervous System was tested and found to be "pearl" (pupils equal and reacting normally to light). Face drop on one side "loss of power 3 to 5. The reflexes were seen to be normal. She said she could not carry her legs. Recorded that patient anxious and no recent travelling, trauma and no recent illnesses. Blood drawn, CT scan ordered and ECG done. She confirmed that at about 11h45 Zofran was administered and Ativan as prescribed where after she vomited. According to the notes at 12h00 she went for the CT scan. She could not remember if her husband accompanied her. She came back at 12h20, awaiting the report.

[44] At 12h55 it is noted that she still was not twitching, was left sleeping and doctor awaiting blood report. At 13h05 noted that she was awake, still awaiting blood results and husband present. Now getting upset because she is twitching again." She testified that she was even twitching during the CT scan but she could not remember anything. She said she does not remember seeing Dr Ndlela. She confirmed that she was discharged in a wheelchair and could not recall if she signed yes to a statement "Patient verbalized that she feels better." She confirmed receiving the x-rays. She confirmed that the person she was with in the morning in the hair saloon did accompany her to the Hospital. From Wednesday to Friday she draws a blank does not remember.

[45] It was put to her that a Physician, Dr Le Roux admitted her at 4 o'clock at Wilgeheuwel Hospital the same place from which she was discharged earlier that morning with the same working diagnosis as at the time of her earlier admission. It is noted in their records that CVA (Cardio Vascular Accident) Left hemiplegia? MS" (which is a Multiple Sclerosis). There being an uncertainty on the exact diagnosis. She said she was unaware of this uncertainty and has never heard of the "MS." She was told that she was under Le Roux from 5th to 6th until 10h40 when she was transferred to another hospital under Dr Shamley, the Neurologist. On 1 December 2011 she was discharged from with the diagnosis still unsure. She confirmed that after being treated by Shamley at the Life Rehabilitation Centre she was much better than the time when she came in. and was able to perform certain limited tasks, for example being a receptionist or doing administrative work. It was noted that the decrease of the upper limb function was limiting to her as being a beautician entailed, using both hands to be able to perform any of the tasks. She confirmed that even a little bit of negative impact on her fine motor function would have inhibited her from doing that type of work.

[46] It was only during re-examination she pointed out that she struggles to dress herself and to make food especially the use of hot water. She cannot chop or slice things since she cannot hold anything on her left hand or to keep sturdy. She therefore cannot drive a vehicle. She can get in and out of bed. The slurring of her speech has improved through rehab. For the muscle spasm she takes the Baclofen. She also takes the antidepressants. She still has spasms at the back of her neck. The cause of the stroke where she had a dissection. She said she feels dizzy sometimes.

[47] Nadine Nunan, whom Evans met in May 2010 was the second to testify. According to her the incident happened almost a year after they met. She has never seen any sign of trauma on Evans side or heard that she suffered from any ailment whatsoever. Evans called her at about 10h15. She was a medical supply sales rep at the time and was on her way to Wilgeheuwel Hospital, one of her clients on a special appointment. Evans told her about the pins and needles she was feeling in her left arm and leg, also that she had a headache and when she tried to walk her left leg gave way. She told Evans to go and lie down, she was on her way. Evans seemed to have stroke symptoms called in medical terms "the Cerebral Vascular Accident" (CVA). She recognized that as a trained nurse that has worked in medical wards as part of her training she learnt how to recognize signs and symptoms of a stroke and to alert Doctors. She knew that it was a serious event. When Evans called she was near Wilgeheuwel. She turned around and went straight to the hair salon which took about 10 to 15 minutes to get there. Evans was lying on the treatment table and told her about the numbness and headache. She also noticed that there was a little bit of flaccidness on her left

cheek not as buoyant as the other check. She told Evans that they needed to get her to hospital.

[48] Evans had a client with her and a hairdresser that works next door. She could not bear her weight on her left leg. She together with the client put Evans on the chair and wheeled her to the car. **It took her a while to get Evans in the car.** When she arrived at Wilgeheuwel Evans' husband was waiting. She had phoned Evans' husband on her way to the hair salon. They wheeled Evans into the Hospital who was still answering them but becoming a little bit vague and did not have direct answers. When she asked Evans how she was feeling she said she did not know but she was feeling different from how she felt at the hair salon, not giving direct answers. She tried to explain to the hospital that Evans might be having a stroke and they ignored her. They took Evans and she remained in the waiting area. Mr Evans went to sign her in with his medical aid card, He came back after an hour or two and said they said she did not have a stroke. And that they were doing further tests, like drug tests. She saw Evans again after 16h00, she could not walk at all and still in a wheel chair. She tried to speak to her there was no reaction her whole body was twitching and saliva drooling out of her mouth. She kept on sliding down on her wheel chair. Mr Evans told her that Evans was discharged, and could go home. She did not agree and told him that they have to find another doctor, Evans was not looking well.

[49] They took Evans to Dr Naidoo, a general practitioner, the Evans' family doctor. Evans was still twitching and could not answer Naidoo's questions. Naidoo confirmed that there was definitely something wrong with Evans. He sent them straight to Dr Le Roux's rooms, a physician at Wilgeheuwel Hospital. At about 16h30 after they dropped Evans at Le Roux's rooms she went to fetch Evans' son from school and brought him to hospital. At that time Evans was doing a scan. She was admitted at the same hospital after 18h00 that day. The next time she saw Evans was at Donald Gordon Institute after they have just diagnosed her to have had a stroke, her left side was paralyzed, confused and different from the Evans she picked up at the salon. She naturally was vivacious full of life but was now down and depressed calling herself a cripple. She could not sustain the business on her own as she had a full time job so she had to close it down. There was no one to do the beautician work. Evans never returned to work.

[50] Under cross examination she indicated that Dr Naidoo's rooms were 5 minutes away from the Hospital and they were there for 5 to 10 minutes before they were sent back to see Dr Le Roux at Wilgeheuwel. Evans was not in a position to give information to Naidoo at all. Saliva was drooling out of her mouth. She gave Naidoo the history of the patient and what had happened that day. She and the husband both spoke to Naidoo filling him in on the day's events. The husband spoke about what happened at the casualty where she was not allowed to go. She did not speak about previous things that happened to Evans. It was put to her that there is information about the headaches that Evans suffered for two weeks prior the incident. She said she did not hear about that or know that she had headaches. The husband did not mention it in her presence as well. It was put to her that the doctor has noted that Evans took Compral, confirmed to be a headache tablet.

[51] She confirmed that Evans was twitching on the left side of her face that was also flaccid. Her left leg kept on shooting out on its own accord when they then took her to Le

Roux's rooms. **They were there at Le Roux's rooms at about 16h30.** She then left to go and fetch Evans' son, therefore was not there when Evans was moved to the hospital section. It was put to her that according to the hospital records it is noted that Evans was already discharged at the Emergency Unit at 14h15 and drip removed after reassessment by Ndlela at 14h10. **She disagreed with the times recorded, adamant that it was at 16h00.** It was put to her that Evans was re-admitted at the Hospital at 16h00, which coincides with her going to Naidoo and being readmitted at the hospital. She said she remembers that it was during peak hour traffic. They had to travel from one side to the other. She looked at the time whilst she was talking to Evans. They took her to Naidoo at 16h00 and thereafter straight to Le Roux. She then left. **She said from 14h15 to 16h00 she sat at the hospital** waiting for Evans and her husband to come out. They got into the car at about 16h00.

[52] In re-examination she said it was busy traffic-wise to get to Naidoo, as it was peak hour time. She could say it was 16h00 when she was discharged because she looked at the time when they started talking and putting Evans into the car. She turned around and said she did not know or recall noting the exact time but correlates with the traffic going there. During the courts' questions seeking clarity she confirmed that she looked at the time when they were putting Evans in the car to take her to Naidoo. When asked if it actually said 16h00. She said she actually does not recall noting the time, the exact time, but it correlates with her with the traffic going there.

[53] According to Mr Evans he has been married to Evans for 8 years and known each other for more than 10 years. Evans has never been on chronic medication or suffered a trauma recently. At around 10h15-10h17 that morning, he received a quite an alarming call at work in Midrand, from Nadine. She suspected that Evans had just suffered a stroke from the symptoms that Evans told her she was experiencing and that she was taking her to the nearest emergency Unit at Wilgeheuwel Hospital. He left work in his boss' car and arrived at the Hospital at 10h50 before Nadine. When Nadine arrived he wheeled Evans into the Emergency part at Wilgeheuwel Hospital. **At that time Evans' eyes were rolling back, she could not walk and her speech was incoherent.** The administrative part of the hospital asked him for his medical aid card and to fill in forms. **He told them that Nadene suspected that Evans was suffering from a stroke.** A person wearing a medical uniform did not pay attention and just wheeled Evans through the doors. In the meanwhile Nadene had gone to remove the car from the emergency parking.

[54] He spent about 10 to 15 minutes attending to the administration part. Thereafter he went inside the cubicle where Evans was. He denied producing any of the personal details on the computer generated hospital records. He agreed that a copy of the front and back of his Drivers' licence and top part of discovery medical card formed part of the record. The time recorded for arrival was 11:03 which he said he had no problem with it. The record reflects Evans' date of birth and age and has his signature at the bottom of the page and a guarantee that he acknowledged to have signed. The patient's complaint is stated as "Complaints of numbness on the left side of the body started" half an hour ago feeling pins and needles, headache 2/52, coughing and clear phlegm for seven days". He denies that he provided that information. He said he was never asked what is wrong with his wife.

[55] In the cubicle he found Evans' involuntarily jerking worse on her left side. The nurse or doctor kept on coming and leaving the cubicle. They gave her a tablet and she vomited. The Doctor told him that they have taken blood tests to see if she was on drugs. They also asked if she was an attention seeker. She was in the cubicle for nearly an hour, during that time nothing else was done except for the blood tests. She was not removed from the cubicle where he was with her. She went to inform Nadine outside the emergency room that Evans was now going for a scan. It was another half an hour before they actually took Evans for a scan. She came back from the CT scan after 45 minutes in no different state. She still had the spasms on the left side and not coherent. The nurse told him that the Doctor will come and speak to him. After about 25 minutes the Doctor came and told him that there was nothing wrong with Evans. He was asked again if Evans was an attention seeker. He was told to take her home and phone for the blood results the next day. Evans still could not walk and therefore he wheeled her out of the emergency room exactly the same way she came in.

[56] Nadine was very cross and insisted that Evans not be taken home. They took her to Dr Naidoo, their family GP at Healthworx Rand Ridge. Evans was sliding down on the wheel chair and her eyes rolling back and spit coming out of her mouth. Immediately, Naidoo knew that something was wrong and referred her back to Le Roux, the physician at Wilgeheuwel to be hospitalised. They wheeled Evans back to the car and to the Hospital. They did not go through the administrative part again.

[57] According to Mr Evans, Evans was outgoing, very confident, very conscious of everything around her and with a very sharp impeccable memory. Post stroke she lost the use of her left hand. She fell over a numerous time including in the shower. At home he prepares the meals because Evans cannot cook. Their helper must be there to help her with the exercises. It is life changing. From somebody that was very independent to somebody that is now very reliable on him, their son and good friends. She does not drive. She has been employed as a casual and as a receptionist answering phones using headphones. She was a bowler and she had now not partake anymore. Does not go to watch their son play rugby anymore which she used to do. She has difficulty dressing, tying buttons or shoelaces. She has to be assisted. She cannot wear high heels anymore.

[58] Under cross examination he testified that Evans never complained of headaches preceding the day of the incident. Never heard Nadine speak about any headaches that Evans complained about. It was put to him that Dr Naidoo has recorded in his notes on 5 October 2011 that the complaint was suffering from "headaches for 2/52. "taking Compral." He could imagine that Evans must have gone to see the doctor. He said he was not sure how it came about that Dr Naidoo wrote the notes if he did not tell him anything, and the Plaintiff could not speak and they were not there for long. It was put to him that the information ties in with what the nursing people noted at the Emergency Unit that:

"Complaint of numbness on the left side of the body started half hour ago, feeling pins and needles, headache two weeks, coughing clear phlegm for seven days."

Also with the fact that the Plaintiff was a heavy smoker although she said she was a mild smoker. He denied that she had chest problems and said his wife was as fit as a fiddle. Also medicine that she took 12 hours ago pre admission was written as Penicillin. Evans however

indicated that she is allergic to Penicillin. It says medicine taken 12 hrs pre admission "Dispirin, Compral, Panado at 7h30. He was at work. Reference is also made to:

"Chronic medication: Yes"

[59] He denied that he took medication with the name Vertise or suffers from any chronic condition or from Vertigo. It was put to him that Vertigo is one of the general indicators for a vertebral artery stroke. He could not say where the Doctor heard about Vertise. Since Evans also denied telling Naidoo or Sim about this. It was indicated to him that a left knee operation and the last meal to have been had at 18h30 the previous night was also noted. Which means Evans did not have breakfast. He said he could not identify the doctor he spoke to whether it was Sim or not, or the person whom the nurses noted as having consulted with Evans at 11h15. He recalled that there was an IV put under Evans' arm and a tablet administered. Plaintiff got sick and the Doctor told him that they have also done blood tests. An intravenous drip was then administered and an ECG done. It was reported to Sim that bloods taken and husband present.

[60] Furthermore it was noted that at 11h45 that patient vomited. At 12h00 she went for a CT scan. 12h20 back from scan waiting for report, patient not twitching anymore, husband present." Then at 12h35, patient scan back and patient reviewed by doctor, awaiting blood results and then at 12h55 patient asleep, no twitching noticed, left sleeping, no complaints." 13h05 patient awaiting blood results, patient awake, husband present." Now getting upset because she is twitching again. Husband decided to wait outside for the blood results. He admitted having spoken to a Doctor but does not know if it was Ndlala. At 13h50 it was noted that blood results back and reported to Ndlala. The doctor discharged the Plaintiff at 14h15. There is a signature for the Patient on discharge and he denies that it is his wife's signature.

[61] According to Mr Evans they went from the Unit straight to Naidoo's rooms. He was not sure what time they left the hospital premises as he was very upset. It was noted patient at 14h10 reassessed by Ndlala and discharged and IV removed. At 14h15 patient left the Unit in a wheelchair with husband. He is not sure if he was given the scan and X-rays report or they were put on the wheelchair. He did not know if the lady who spoke to him was Ndlala, but when he asked for diagnosis she said that she was "attention seeking." She told him to come back for the drug screening test results.

[62] He admitted that when Plaintiff was admitted the second time at Le Roux's rooms at Wilgeheuwel he signed the papers. He was there all the time the Plaintiff was with Naidoo. It was put to him that Naidoo noted the headaches and pills taken including Compral. He denied that his wife was taking Compral or that they have Compral in the house. Naidoo was called as soon as he has wheeled Evans. They were with Naidoo for 10 minutes. He could not remember what time they left the hospital or arrived at Naidoo but they did not have a reason to hang around the hospital after Plaintiff was discharged. He could not remember any of the times including when they came back. Plaintiff is looked after by a domestic worker full time who used to work only once a week. She was also studying whilst working. She had passed some of the things only studying facials.

[63] The next witness for the Plaintiff was Dr Kasler SM ("Kasler"), a general Neurologist who has been in practice since 1988. He confirmed his referral to his field of expertise in neurology, as the headache medicine and that they see a lot of common neurology. His particular interest is in migraine and headaches in which he has been involved for a period of more than 20 years. He went through his joint minutes as set out at the beginning of the Plaintiff's evidence.

[64] His medico-legal report on Evans was placed before court based on the bundle of information/documents received from attorneys, written 2 years after the incident, which means 5 years before the trial. It is noted that the following information was made available:

[64.1] A description of the event from Mr Jason Evans;

[64.2] Clinical notes from Wilgeheuwel Accident and Emergency Department.

[64.3] A CT scan of the brain reported on by Dr D Goodman of Dr van Rensburg and Partners.

[64.4] Notes from a second admission to Wilgeheuwel Hospital"

[64.5] MRI scan of the spinal cord reported on by Dr J Perra of Dr van Rensburg and Partners

[64.6] Clinical notes from Donald Gordon Medical Centre.

[64.7] Referral letter from Dr Desmond Shamley, a Neurologist;

[64.8] Notes from Life Riverfield Rehabilitation Centre.

[65] Kesler said he understands that at the time of Evans illness she had no significant past medical history other than asthma. She smoked 10 cigarettes a day. There was no history of substance abuse. "He wrote this relying on the notes as listed and he was not certain if some of that was also from the description by Mr Evans. He cannot remember in what format it was.

[66] His brief outline approximating Evans' stroke, delineating what would have been a proper diagnosis and treatment in order of importance and the alleged breach of legal duty by the Doctors is set out in the medico legal report he submitted after his examination of Evans in 2013, 2 years after the stroke. Dr Kesler's reference documents were the hospital and clinical reports as mentioned in par [66.1 -66.8] furnished to him by the attorneys. According to Dr Kesler:

[66.1] Evans suffered neurological symptoms of stroke being sensory disturbance which can mean numbness, tingling, pins and needles, burning or some sensory experience sensation on the left side and mild weakness, that being onset at 10h25 on 5 October 2011. If presented with stroke like sensory "symptoms of numbness and tingling down one side, this considered to be acute symptoms that indicate acute

stroke, which is a medical emergency. The treatment for the acute management of stroke is time dependant. It is therefore vitally important that patients who may be having stroke are taken to an emergency unit as soon as possible. As Mrs Evans presented herself to the casualty within half an hour of the onset, the doctor who examined her may well have suspected stroke, being the most likely diagnosis in spite of Evans relative young age for these acute symptoms. The purpose of a CT scan of the brain in the acute stroke situation, is to exclude hemorrhage which will immediately be seen on an uncontrasted CT scan. This well-known phenomenon should be within the scope of knowledge of a Casualty Officer.

[66.2] Casualty Officers ought to be well aware of the option of thrombolytic agent administration in the acute management of stroke. The appropriate specialist should be called to assess the patient and make this decision. At Wilgeheuwel he was not aware of a resident Neurologist, but a specialist physician like Dr Le Roux would have been eminently suitable to administer the medication appropriately. The thrombolytic agents have been used therapeutically for well over a decade. The South African Guideline for the management of ischaemic stroke and transient ischaemic attack 2010: A guideline from the South African Stroke Society (SASS) and the SASS Writing Committee published in November 2010 whose committee consists of independent academics and private stroke neurologists and physicians, stipulates that treatment must commence within 4 and a half hours of the onset of symptoms and that the cerebral hemorrhage be excluded on a CT or MRI scan of the brain. In general the CT scan of the brain of patients who present with a cerebral infarct, will often appear normal in the first 12 to 24 hours after the stroke. It is therefore obvious that a normal CT of the brain does not exclude a stroke. Evans was discharged without a working diagnosis or a plan of action or a referral, taken to a GP who in turn referred her to Dr Le Roux and was readmitted at Wilgeheuwel Hospital.

[66.3] Evans was not given an opportunity of proper assessment for treatment with this medication. At her second visit and re-admission Evans was out of time for treatment by the time lapse. She was no longer a candidate for the thrombolytic therapy. It is not clear why an MRI scan of the spine was performed. On the findings of the MRI scan at the Gordon Institute it did not contra-indicate. The cause of Evans stroke was detected to be a blockage in the right vertebral artery. The brain receives blood through two large arteries, arterially in the front and posteriorly at the back, the two in the front are the carotid and the two at the back are the vertebras. In Evans' case it is said it was obvious that the right vertebral artery was blocked and this was thought to be due to a condition called dissection of the blood vessel. In the middle there is a dedicated area which it is said is not receiving any decent supply of blood and oxygen and then there is an area around it they refer to it as the penumbra, like in an eclipse which penumbra will be getting inadequate supplies of blood and oxygen, so that is the threatened brain. On the possible treatment and benefits of thrombolytic therapy, the aim of such therapy is to reperfuse the ischemic brain and salvage the threatened brain. It is said to be imminently salvageable with reperfusion. The reperfuse therapy assist in getting blood and oxygen into the area that has been deprived, where it is inadequate or actually have stopped, it is never an absolute area.

[67] Having considered all the documentation, Kasler in his 2013 medical report came to a conclusion that "Being 19 months since the stroke, there was no likelihood of further improvement." In general, most strokes will have their maximum improvement within three months. A further chance of some functional improvement may take as long as a year, but after a year there is no likelihood of further neurological recovery. He regarded the treatment offered at Donald Gordon and Riverfield to be a standard correct therapy with physio and occupational therapy as apparently excellent therapy.

[68] Kesler concluded a joint minute with the Defendant's expert, Dr Rosman in which they agreed that:

"The Plaintiff was at the Emergency Unit within 30 minutes of having started to experience the neurological symptoms. Kesler indicated not to have consulted with either the Plaintiff or her witnesses to verify that. Reference was made to the note in the report that "Plaintiff complained of sensory disturbance on the left side and was suspected to show mild weakness on examination." Sensory disturbance can mean numbness, tingling, pins and needles, burning or some sensory experience sensation. He noted that:

"Her CT brain scan was reported by the radiologist as normal. She was taken over by the new doctor in the afternoon and the details of handover are unknown. She was discharged by the new doctor and no specialist opinion sought. She was referred back to the hospital by Dr Naidoo, her GP, after the stroke was recognized. The early presentation at the Emergency Unit after the onset of symptoms would have made her a candidate for treatment with tPA, a medicine which if given within 3 hours of the onset of symptoms has overall better long term outcome.

"They consider that with appropriate treatment the chance of her being significantly improved would have been about 33% percent. Acute stroke is a medical emergency and she should have been admitted to hospital. She was not afforded that opportunity. It appears that stroke was not considered by her treating doctors in Casualty. The diagnosis and initial management of stroke should be within the knowledge and capability of all doctors who work in an Emergency Unit/Casualty. They consider her management at her initial visit to be below accepted reasonable practise."

[69] He explained that Clinical notes will include anything written by a nurse or a doctor. The time of 16h00 was noted from the clinical notes and Kesler agreed that it was the time that Evans was readmitted at Wilgeheuwel after she has been to Naidoo. He also considered the CT scan report especially where its stated that: "If symptoms persist or worsen an MRI brain is recommended." According to him symptoms referred relate to the fact that a normal scan of the brain done in the early hours after a stroke does not exclude the stroke, it may take some time for the dying tissue to mature radiologically to show up on a CT scan. Not only that, but certain areas of the brain are not that well shown up on an ordinary CT scan of the brain, because they are hidden by bone. He said in fact the area where the Plaintiff had her stroke may not have shown up even some days after the stroke on an ordinary uncontrasted CT scan of the brain." The reason that a CT scan of the brain is indeed done as soon as possible, in the early hours, if someone is suspected of having a stroke, is primarily to

exclude hemorrhage, that is bleeding or perhaps some other possible cause for their symptoms. The reason for the MRI scan not done instead immediately is that the CT scans are generally more abundant. So, not every hospital has an MRI scanner, secondly they take a very short time to do, so as opposed to an MRI which might take 45 minutes, even an hour. A CT scan can be done literally in a matter of two to three minutes and also cheaper. Although an MRI is often a lot more sensitive, but it takes longer and patients in their throes of stroke may be restless. He, in fact, he thought Evans was quite restless and understood that they had to give her a mild tranquiliser to calm her down when she was having the scan. He confirmed that in summary he is saying this is a fast efficient way of determining whether or not there is hemorrhaging and to exclude other potential causes of the symptoms. He said sometime brain tumors may present in a rather stroke like fashion and that might be picked up on a CT scan.

[70] On various trials/studies done looking at time onset of stroke symptoms to time for commencing thrombolytic therapy that is IV (intravenous treatment) to dissolve the clot and restore blood flow have shown that the longer it takes to start administering the drug the less likely the results are going to be favourable, so the best results are obtained when the treatment is given early and that is generally held to be within 3 hours. Although there is still some benefit to be derived after three hours and under four and a half hours, but it is the law of diminishing returns. Not only are the benefits less good, but also the risks become greater. In explaining the recording by the radiologist that if "symptoms persists" he stated that it is not clear if radiologist was informed cause his report will always include a short clinical note by the Doctor to say this patient's symptoms and signs are the following and indicate if patient's symptoms continuing. In this matter the Doctor and radiologist just say it is a normal scan and if patient symptoms continue or worrisome then MRI scan should be ordered. He confirmed that from the evidence of the three witnesses that the Plaintiff's condition did persist such that she left in the same or worse condition. The MRI scan was still done the same day on 5 October 2011 at 5h23pm. This did not detect the stroke still.

[71] The Plaintiff was out of time with treatment on the findings of the MRI scan by the time lapse of her re-admission. It did not contra-indicate. He had also recorded that "Plaintiff presented with the onset of numbness of the left arm and leg on the morning of 5 October 2011 at 10h25." He said he is not sure where he got the time, if he did not extrapolate from the history that was received by the admitting Dr Sim or the nurse who noted that she said her symptoms began half an hour before, so he worked backwards. If Evans arrived at the Hospital at 11h03, well registered and was seen by the Dr at 11h10. She would have been well within the window of 90 minutes or even three hours. So according to him there is strong evidence that the closer the onset of the symptoms to her presentation at the hospital or the clinic is brought, the better the chances of doing something if one acts correctly within 3 hours. He confirmed that fighting about whether it was 10h15 or 10h25 is neither here nor there, it is within all these parameter.

[72] He referred to the Emergency Unit triage nurse's notes that read "complained of numbness on the left side of body started about half an hour ago, feeling pins and needles, headache x 2/52, coughing – two weeks coughing, clear phlegm for seven days". He had then written that "she complained of numbness on the left side, it started half an hour previously. "Her past medical history of asthma, smoking and a previous knee operation was also noted". The Casualty Officer's notes by Dr Ndlela record that she "complains of numbness on the left side of her body since 30 minutes ago. The Dr when she saw the patient recorded that the

numbness had started to be felt 30 minutes ago. The notes then says that the Plan was to perform blood tests and order CT scan. The CT scan was performed at 12h24. It was put to him that it is 2 hrs after the onset that the CT scan was only done. If one looks at the admission, the label that says 11h03 they were at the administration, 12h24 is not indicative of expedient attending to a possible stroke.

[73] It appears the stroke was not actually considered by Dr Sim in her note for if it was considered then there would have been some urgency in getting the scan so it would be incumbent on the Casualty Officer under those circumstances to expedite the scan by talking to the radiologist explaining that she had a patient who probably had a stroke within the time window and request the expedition of the results to be given as soon as possible. In this case the scan was simply ordered and was put in line when time was available. In fact it was not indicated why the patient was sent for a scan. "The doctor who took her history and examined Evans may well have suspected a stroke as she presented with stroke like sensory "symptoms of numbness and tingling down one side." The scan could then have been done in 15 minutes if the diagnosis was there being a potential or looks like a stroke. They would have known that there is no contra indication for using the only therapy. He agreed that for the thrombolytic therapy, if one refers to the widest possible period 10h00, the onset of the symptoms meant the 90 minute period had been achieved/passed. With regard to reporting that a toxicology screening was done and a full blood count. He confirmed that full blood count is done to search for possible infection and the tests requested indicative that the person who ordered them was not looking for a possibility of a stroke. Accordingly time is brain, the more time goes by the more it is lost, the more brain cells you use, there being a limit in terms of the window. He said most of them look at 3 hours, those who are more generous will go as far as four and a half hours. The most important thing being time. Patients are encouraged to go straight to hospitals where there is an Emergency Unit instead of seeing a GP.

[74] The symptoms to him was so obviously stroke like, that one would wonder why a medical person would not suspect that. He not having spoken to the Doctors would not really know. He further notes that "In spite of her relatively young age stroke would still be the most likely diagnosis in a patient who presents with these acute symptoms." He was not aware of Wilgeheuwel Hospital having a resident neurologist, however, Dr D Le Roux a specialist physician would have been eminently suitable to administer the necessary medication. He indicated that not every facility will have a resident neurologist so physicians are now generally expected to administer the medication as well. Sometimes if they are confident to do this on their own, other times in consultation with their favourite neurologist.

[75] In respect of the guidelines and the use of "Thrombolytic agents he said "they have been used therapeutically for well over a decade." He referred to the South African Guidelines *supra* whose Committee was chaired by Prof Briar from UCT where it was reported that 'there is ample evidence that protocol driven multidisciplinary / unit care within a hospital improves recovery from stroke.' He further quotes from the guidelines that "Treatment in a stroke unit has been shown to reduce mortality as well as to reduce the likelihood of dependency after stroke. Avoiding delay should be the major aim of pre hospital phase of the acute stroke care. An acute stroke or transit ischemic attack TIA should be treated as a medical emergency and evaluated with minimum of delay." The guideline further states that: "General supportive treatment is emphasized and is directed at maintaining homeostasis and the 'treatment of complications. Intravenous thrombolytic therapy with recombinant tissue plasminogen

activated t-PA is an accepted therapy for acute ischemic stroke within 4,5 hours of onset symptoms, but can only be administered at centers with specific resources. He agrees with this idea adding that the idea being that if you are not confident in doing it yourself or do not have the facilities then you should transport your patient to the nearest facility that can do that urgently. In casu they knew that Le Roux was in the vicinity.

[76] According to Kesler the guidelines also stipulate that treatment commences within four and a half hours of the onset of the symptoms and the cerebral hemorrhage be excluded on a CT or an MRI scan of the brain." He said "Evans was discharged without a working diagnosis or a plan of action or a referral." Whereas in general someone who attends a doctor, whether in the emergency situation or a routine visit wants to come out of the consultation with some kind of diagnosis even if it is not accurate, and should be the highest level of one's understanding at that time. It is true that in some medical conditions it is well impossible after a consultation of an hour to come to the correct or accurate diagnosis, but should still at that stage have a working diagnosis, something that will be figured out with time. Obviously in urgent situations there is much less time and one should come to a much quicker conclusion. However discharging somebody saying they experience numbness is not a diagnosis but a symptom. Admitting that sometimes that can be their highest level of understanding, he said they rather should then go somewhat further, even if it means admitting somebody for further observation/ investigations or for specialist care or referral. The Doctors who attended to Evans were Casualty Officers, not specialist. But no plan was out as to what was going to happen in the future, especially since the patient was not better. A patient would be referred just to the Specialist to find out what more is going on if there is no diagnosis. He was not sure if the Emergency Unit had a Neurologist. He thought Shamley did sessions there.

[77] He had also noted that Evans was "a 37 years old woman" who presented within half an hour after the onset of her symptoms or stroke. Her stroke was neither recognized nor adequately managed. She was inappropriately discharged from hospital instead of being admitted or referred to a specialist for further management. She was denied an opportunity to be evaluated for thrombolytic therapy which may have resulted in a much more favourable outcome. He said there is no certainty that if it is administered a more favourable outcome will result (be achieved) but only probabilities. He said there are many procedures and treatments which are controversial where one cannot absolutely predict the outcome. Thrombolytic therapy is different from many other forms of treatment where you cannot be sure of an outcome in that where there are only, one of the differences is obviously that you've got no time, you don't have the leisure time to decide whether are you going to do surgery or not, very rapid action required. In relation to proper tests to determine if there is no contra indication, with nothing to indicate that you do not apply the thrombolytic therapy, he said one is guided by literature which is considerable about the outcomes of the thrombolytic therapy and to a much lesser extent on one's own experience.

[78] According to him literature is unequivocal in stating that patients who receive timeous thrombolytic therapy are more likely to have a better outcome than those who do not. It is also true that some patients who do not receive thrombolytic therapy they also do well. However the patient's chances are better if they receive therapy and they remain greater the earlier the therapy is received, this has been stratified into time period so to know that a patient does better if therapy is received within 90 minute than if it is received within 180 minute, et cetera and the fall off then becomes quite rapid after that, the falloff in possible

improvement although improvement been described up to four and a half hours, certainly one would be cavalier if one gave t-PA after that period of time. So in the 90 minute period the chances of doing better are about 2.8 times better. A patient is likely to do better by a factor of 280 per cent than if it did not receive it. Those are called odd ratios. So the likelihood to do better by a factor of 2.8 percent that if one did not receive the therapy and, and they also look at how accurate those odds ratios are and that is called confidence interval and the confidence has to be greater than 65 % for it to be statistically significant. So in 90 minute one has a 2.8 times better chance if you receive the therapy. The reasonable accepted practice in South Africa is one has to obtain some form of consent from the patient or their family. In some cases the patient is unable to give consent because of their condition or inability to talk and understand, but it needs to be rapidly explained to the family what are the possible benefits and possible risks. There is a risk of bleeding, both cerebral and systemic hemorrhage. In other words hemorrhage in other parts of the body, so there are risks involved and some patients will do worse on receiving t-PA thrombolytic therapy than they would have done with Placebo.

[79] Overall there is no doubt that there is benefit in the case of Mrs Evans, especially being youthful. She was not 40 yet, one would be, therefore in general more aggressive under those circumstances in pushing for thrombolytic therapy urgently. A reasonable specialist would have gone for this therapy given now what we know about how Mrs Evans presented and the results of the scan. The best case scenario is that the patient miraculously has a complete resolution of their symptoms so how this works is that the t-PA dissolves the clot and the blood flow is resumed to the area which is not yet severely damaged. So the patient, having personally experienced being unable to talk and severely profoundly weakness down one side of the body and who within an hour becomes apparently much better and, have no residual symptoms and then the spectrum will go all the way across the patients who have no benefits at all and those who might die as a result of complications, the main complication would be cerebral hemorrhage. Not all cerebral hemorrhage are fatal and many of them will also in their own right recover a great deal so just the mere happening of a cerebral hemorrhage is not a death sentence in itself, but it is certainly an adverse event. So there is a spectrum that one can see from complete recovery to no recovery and even worsening. He said it was difficult for him to say what would have been the outcome had the Plaintiff been treated timeously within the window period of 90 minutes cause he can only base that on literature and one's sense of optimism. So he would have expected the Plaintiff to do better than she did without treatment, hopefully considerably better.

[80] He noted that the Plaintiff has considerably improved which is what one would expect from patients who survive the stroke, some will improve very slightly some a great deal. In many of the trials the outcome was to look at their level of functionality three months after the stroke whether they received therapy or not and there are various scales that are used in judging patients' progress at the three month period. One that is commonly used (although there are many others) that he uses is called the Rankin Scale where 6 would be a patient who did not survive three months and 0 would be a patient who has no symptoms after having a stroke and then graded in between. He said although he has not examined Evans, it appears that she falls somewhere at the level of Rankin 4, because she requires aids in walking, she requires a walking stick and a splint. He had hoped that with treatment they could have got her down to a 0-1 or 2. The Warfrin she is taking is only administered as a preventative for a secondary stroke, it would not have helped her current situation. He did not think they would

have started her with Warfarin immediately after the stroke, they probably waited a couple of weeks, which would have been the correct thing to do. The therapy is aimed at dissolving the clot and certainly promote hemorrhage. It is therefore important to check that there is no hemorrhage already by doing the scan to exclude blood. That would be an absolutely contra-indication if there is, if the stroke is due to hemorrhage, So it is important.

[81] From a clinical point of view assuming that Evans did not have a complete 100 % recovery, then he would have expected her hand and arm to be more functional probably still a bit weak and a bit clumsy and would have expected her to walk without aids, a brace or a stick which would be a more favourable outcome, what they are aiming for after all. Otherwise why would they administer the medicine. He has also stated in his report that "The American Stroke Association provides the following guideline for the Administration of t-PA" "The diagnosis of ischemic stroke causing measurable neurological deficit" he meant that one must have something one can actually measure. They can measure weakness, it is pretty crude (basic). One does not have to get a special machinery that an occupational therapist have to test how hard you can pump a muscle. It can be done at the bedside and it is nevertheless reasonably sensitive so one has got to be able to measure something whether a weakness, or numbness or tingling. When they test for sensory symptoms they use pins and cold objects and tuning forks and they can in a sense get some objectivity out of that, since one wants to have something that one can show. A patient may happen to have a scan that shows a stroke, but with nothing to show for it, one should be aware that it sometimes does occur because they do sometimes see patients retrospectively, who have scans who are shown to have had strokes in the past, but have never presented themselves to anyone. They clearly at the time did not have anything measurable. They might have been out of some sorts for a day or two, but, so you want to be able to show that a patient has a deficit, a neurological deficit 3/5 weakness on Evans was recorded at Wilgeheuwel.

[82] On neurological signs not clearing spontaneously; he said it is important as one would like to exclude patients who having transient ischemic attacks TIA and by definition they are transient episodes of neurological deficit which get better on their own. It is like a mini stroke that improves spontaneously. The majority of those will improve within an hour. Although by definition a TIA is regarded as a temporary neurological deficit on a vascular basis lasting less than 24 hours, but in actual fact most TIA's last for less than half an hour. So one would want to exclude those patients who are improving because they have had a TIA. In this case there is no question of that since they know Evans had a stroke not a TIA. Evans neurological signs were not minor and isolated. There is a scale for measuring the deficit, an America scale, namely the National Institute of Health Stroke Scale (NIHSS) which ranges from 0 to 42. One does not want to treat someone who has minor symptoms, in other words four or less than on that scale, because the outcome is likely to be pretty much the same if you do not treat them. One wants someone who has recognizable hard and not isolated signs, in other words not just a weak finger and also don't want somebody who has very serious signs. Again if it is over or about 25 then the outcome is likely also not to be so good, but want somebody with a middle ranging stroke which the majority of patients will fit into. He believed Evans did fit in.

[83] On the question of symptoms having to be less than 3 hours before commencing treatment, he said although the South African Guideline pushes that limit a bit further as he has already testified that is what was applying at the time so evidence that was discovered

last week cannot be brought in. But must work with what was available at the time as we are judging the conduct of the Doctors at that time. He explained his reference in his report that: "Benefits of thrombolytic therapy: the aim of such therapy is to reperfuse ischemic brain and salvage threatened brain." It means getting blood and oxygen into the area where it is inadequate or actually have stopped. The therapy assist in achieving that. He also wrote "For every 100 patients treated with thrombolytic therapy 32 will have a better outcome and 3 will have a worse outcome" which refers to the 90 minute interval. It is indicated that the joint minute between him and Dr Rosman also confirms the statistic referred to.

[84] Under cross examination Kosler testified that thrombolytic therapy has been used in acute cardiac events for more than 25 years, but because of an unacceptable high rate of cerebral hemorrhage, the medication that was initially used in coronary attacks, heart attacks were found to be unhelpful in brain attacks, in stroke. Various other drugs have been tried today in South Africa. Activase is the only thrombolytic agent they apply registered however, there are also newer ones available overseas. In the USA there has been one called Euro=Carnaise, others tried but also abandoned it because of the unacceptability high rate of cerebral hemorrhage in those cases. It was probably slow to come to South Africa. Prior to the guidelines that were published in 2010 there was another guideline written by the Department of Health, that was 5 or 6 years before that which according to him not a good document as it suggested the use of a drug up to six (6) hours after onset of the stroke.

[85] So more recently over the last 10 years or so protocols have been set up, initially people were a bit weary to use it if they were not neurologists, but thinks it is now commonly used if patient arrive early. The initial thinking was 6 hours which was out of kilter with the whole international scene at that stage. He confirmed that his own protocol is 3 hours and can be persuaded if it is 3 hours 10 minutes. His policy in general is that risks are too great after 3 hours. Because not only is there a reperfuse factor but also an efficacy factor that the drug is not going to work as well. He would therefore not be critical of a doctor who does not administer t-PA or Alteplase after 3 hours of onset of stroke. Even if there was a chance from one of the later doctors to fall within three to four and a half hours they will not label that as negligence on the part of the doctor for not referring the patient to thrombolytic therapy. 3 hour window opportunity applicable. Kesler also confirmed that the producers of Alteplase prescribed it to be used within the 3 hour window.

[86] Explaining how to pinpoint the onset, he said it should be when the patient was last seen to be normal, which can be a witness' event (how the patient was observed) or the patient himself may be able to express their problem. If one wakes up with a stroke symptoms then they are deemed to have started (onset) when they went to sleep. In general a patient has got to know roughly and hopefully accurately if possible, the time of onset of symptoms as it is a subjective experience on the part of the patient herself, to start feeling that there is something wrong as it was in Evans' case a subjective feeling. The sign on the other hand is what is demonstrated physically when examining the patient, so that is what the doctor could see physically, because sometimes there are symptoms that cannot be seen. When somebody feels fuzzy or feels lame but functional, the sign is no impairment since that is what the doctor can see physically when he examines. He agreed that in Evans' case it would have been the inability to hold herself or to bear weight. The first sign being the sensory symptoms in the region of the upper arm initially and it crept down a bit. He conceded that the time of the onset is different and need to be pinpointed or established by evidence. He agreed that he reviewed the documents and concluded and according to him it was 10h28 or 10h25. It

however seems not to have been correct another indication being that it might have been 10h15 or earlier or half an hour. Minutes now becoming more important at the close with a question on where does the 90 minute window starts, since it was said to be different times by the witnesses.

[87] He indicated that he usually goes to some of this hospitals where they have an Emergency Unit and was aware of how they operate having worked at the Hospital with an Emergency Unit as well. He confirmed that the hospital documents has a sticker that indicate that 11h03 is the time that Plaintiff's husband registered her as a patient. It was not the time that the doctor had her in her hands but with the administrative staff. The triage nurse have indicated that the Plaintiff arrived at 11h10, blood pressure checked by 11h10, taken 2 minutes to do so. He said the nurses to some extent must alert the doctor of a serious situation. Dr Sim was consulted at 11h15 which he saw as a good thing and agreed that he was therefore not on Evans bedside 11h03 like he might have presented.

[88] It was put to him that Ndlela only became involved after 13h00 more than three hours after 10h00 at least, she will have to be treated on a separate basis from Sim, the first reference to her was at "13h05", awaiting blood results. Ndlela saw the patient and reassessed her at 14h10. He agreed that it was getting into dangerous grounds to criticize Ndlela, stretching the hours to the limit to criticize her for her not to have given the t-PA. It was also put to him that five minutes after it has been reported there is evidence that she saw the patient. Therefore she could not have administered the Alteplase. She would have heard to refer the patient to a physician if she was alive to the fact and heading her duty of care, as there is no Neurologist at that hospital on full time. Kersler pointed out that the ideal place to administer the t-PA would have been at the ICU, but they have known to have started t-PA in the radiology Department in order to save time instead of waiting for the patient to come all the way back, the Doctor goes to the Radiology Department waits for the scan to come out, checks, discusses with the radiologist and begins there or then can be given at Casualty. But the patient must be admitted in the ICU. The medicine is given over the period of an hour. 10 % of is given as a bonus dose, so about 10% is given as an immediate injection intravenously and the rest the 90% is then infused over a period of an hour and sometimes the logistics of taking the patient over the porter to the ICU there may be some delays, so he would quite happy to begin treatment even in the Emergency Unit. He said he accepts that the Casualty Officer at the time might not have wanted to take the responsibility of giving medication or even starting the medication without specialist input. But it can be administered by a nurse under the care of a Doctor. He said he thinks those days in the Casualty were conservative. Whereas at the moment the Casualty Officers will initiate therapy but after talking to the Specialist as it is preferable to have an input of a Specialist.

[89] He disagreed that the thrombolytic agent is something that is not kept as a routine but will have to be ordered, saying it is also used in situations of acute cardiac medicine. So the Emergency Unit will have access to it in an emergency cupboard or in the unit or if it is after hours in the Pharmacy. It would have been available in 2011 in the hospital but he was not able to say whether factually they had it on site. He also had some sympathy for Ndlela who took over that the handover was difficult (as they will always be), if from Sim, her colleague has told her there was nothing wrong with the patient and just waiting for her blood results. He could understand that perhaps Ndlela was not as thorough as she was supposed to be at that stage because she knew that Evans had already been evaluated by the doctor, and maybe she has been busy with other patients who have been waiting. He accepted that

Ndlela was out of the 3 hour window period. Also that it would have been outside the period had Dr Le Roux been obtained, made sure there is a bed at ICU to transfer the patient once the infusion has been started which might take time. He accepted that the time accuracy is very difficult and accepts that his time of 10h25 it might have been later 10 or 15 minutes earlier.

[90] On there being a query about the 3/5 loss, Kasler disagreed that there can be a query on 3/5 and said it cannot be queried as it was a significant weakness. It would have been an indication of acute situation of a clearly affected patient. He says it is however not absolutely clear why she was twitching. He said it might have been the myoclonus maybe on the basis of some irritation of the tissues in the modulla oblongata and the top of her spine. On scoring her on the NIHSS Scoring system he indicated that he has not gone through the exercise however he said she might have been more than 4 and less than 22, which is moderate. He does not understand why her level of consciousness was not always perfect. He would, however say that this was a moderate severe stroke which required urgent therapy. The severe stroke is over 24 in terms of the administration of t-PA. He was referred to the South African Guidelines for Management of Ischemic Stroke and Transient Ischemic Attacks where it is stated that they were dealing with the "exclusion criteria" that says "caution should be exercised in treating patients with major deficit of a NIHSS score of more than 20." Kasler's response was that scoring can be out by a couple of points but he always use 24 as his upper limit but accept that was a local guideline. Rosman had put her on 23 at the time of her presentation. He said he could not argue with Rosman's finding as he did not consult with Evans at the time. He said his limit in giving thrombolysis treatment is 24 whereas in the document they speak about 20. He could put Evans between 4 and 24.

[91] With reference to the modified Rankin Scale ("D2") of which there are six scales of classification of patients. It was put to him that where the scale/score indicates a perfect result meaning there are no symptoms. 1 means no disability despite symptoms. 2 slight disability, unable to carry out all previous activities but able to look after own affairs without assistance. 3 is a moderate disability requiring some help but able to walk without assistance (walking aids). 4 is a moderately severe disability, unable to walk without assistance and unable to attend to own bodily needs without assistance. Kesler agreed to have put Evans on 4 and said unfortunately each scale contains not just one criteria. He refused to concede to 3 insisting on 4 saying because Evans walks with assistance and 3 is able to walk without assistance. He pointed out that a person can be affected to a lesser or greater degree. It is not absolute as to whether she will be able to do her job as previously he said that would require a Therapist's input. He said Evans had an absolutely useless left hand that has got no function at all. The likelihood however was that she could have been better off than she is now. Then for the Doctors to win this case they will have to say no doctor has to ever fear giving thrombolysis therapy to somebody because it does not matter. Although they know that patients get better on this sometimes a whole lot better. The likelihood being 50% plus 1. He said he understands that this case hinges on that a doctor can be negligent and step away but it is known that the drug works better than not giving it in the majority of patients. On the odds ratio he has indicated chances of improvement to be 2.8 times what they would have been had they not received treatment as indicated in the statistician's paper. He confirmed his observation that to a 100 given the treatment 32 will have a better outcome whilst 3 would have the worst than what they would be without the treatment, having complications in the medication.

[92] On the Target Stroke extract Lansberg Etal/2003 where it says "Number of patients who benefit and are harmed per 100 patients t-PA treated in each time window" 0 – 90, that is 27 patients benefit which is 1.3. In 91 to 180 minutes 22.2 will benefit and 2.4 will be harmed. The figures from different meta analysis trials can differ from as much as 27 to 35, 36, the general standard is 32 and graph says 27. He confirmed that he agreed in a joint minute with Rosman that 33% chance of improvement. He then was saying the odds are 280% against 1. He said what it meant is that if one has odds ratio of 1 it means there are no benefits from the treatment. Odds benefit of 2 means twice the number of people are going to benefit which is a 100 %.The odds of 2.8 it 280%.

[93] On being referred to Dr Werner Hacke table ("D3") from Heidelberg, that refers to 3 months favourable outcome, defining the three neurological function scores of modified Rankin scoring 101. On a 100 people given Altepose, Rankin 1 is a good outcome and Rankin 2 to death being a bad outcome. It had bad outcome of 59 out of a 100. Kelser did not accept the results on the trials made on the Altepose arguing that the standard correct results is that roughly 33 % of patients will do better than they would have. He said it is easy to take one trial here and one trial there and manipulate statistics in an awful way, which is what was being done in this matter. He therefore does not accept the results. He pointed out that the flaws in the test is that it does not tell you who has improved. It might tell you in absolute terms who had done worse or well at the time of the results and no recording is made of who has improved after the last results of the trials. Kasler said he does not agree with the premise. He wanted to know why does he denounces the odd ratios as an important static criteria. He was advised that the odds ratio is the one that is tested and to see if they are medically sound. He said he accepts the figures but not the premise that the improvement is so very slight. He agreed that he will have to accept the figures as correct as the statistician will also be depending on those figures. He accepted that they are dealing with a difficult modest imperfect agent that shows statistical significance. He accepted that the Rankin 2 was discussed and that it would be a very acceptable outcome to many patients if they started off as a Rankin 4. He could not answer what Rankin score he would give Evans at presentation at hospital. With reference to the National Institute of Health Strokes scale. He confirmed having done the exercise with the NIHSS at the time of her presentation. And had narrowed it down to 22. He thinks it is 12 plus or minus 1 which is moderate. It was put to him that on the calculations done by Rosman her rankin scale is put too much higher on 23 which would have agreed with what he said the previous day. He said 22 is the limit where they stop treatment. He said it hinges completely by saying anywhere between 4 and 22. And if that is converted into a Rankin scale he had not done the exercise. He said at the moment she was on Rankin scale 4 because of her walking problem. She seemed to have been incapacitated at the time. So it might have been 4 or 5 at the time of presentation.

[94] Reference was made to D3, the Hacke table where the heading is 90 – 180 minutes with the Placebo there were 15 Rankin 0's, 14 Rankin 1's, 10 Ranking 2's 17 Rankin 3's, 9 Ranking 5's, and 18 deaths. It was put to him that there were 43 Rankin 1. In the instance of one with treatment there was 18 Rankin 0's, 25 Rankin 1's and 7 Rankin 2's, 14 Rankin 3's, 11 Rankin 4's, 8 Rankin 5's and 12 or 17 deaths. The spreadsheet that is D1 and the added Rankin scale 1 scored there were 43 Rankin 1's in instance where there was treatment. But 57 of those patients who were treated fell outside of the Rankin 1 score. But that cannot be looked at in isolation because with the placebos 30 of the non-treated patients also had a good outcome of Rankin 1 and lower. The articles are set to move down getting into 181 to 270

minutes the outcomes becoming much better. The outcome that is indicated is that on 37 treated patients will have an outcome of Rankin 1 and better. Whereas 63 will have an outcome of worse and treated patients who will do well without any treatment as supposed to 69 the gap between treatment and versus non treated patients that gap becomes narrow Kesler said that is why he does not feel that treating over 3 hours is indicated. He confirmed that it is an overall modest result. He agreed that the gains were fairly modest. He confirmed that it is not everybody who received treatment that will do well and return to normal function.

[95] He was referred to an article from the Cochrane Library published in 2016 on "Thrombolysis for Acute Ischaemic Stroke (Review) noted as D4. He said he does not know anything about the article. It reads on p20 under Discussion:

"There is a strong evidence from 27 trials of 10 187 participants on the immediate hazards and the apparent net benefit of thrombolytic therapy given up to within 3 hours of acute ischemic stroke, with overall benefits suggested up to 6 hours, for people aged over or under 80 years and with different stroke severities. Overall, thrombolytic therapy was associated with the significant excess of deaths within the first 7 to 10 days, symptomatic and fatal intracranial hemorrhages and (for all drugs) deaths by the end of follow-up. Most of the excess of death with thrombolysis occurred early was explained by a fatal intracranial hemorrhage"

He confirmed that hemorrhaging was the usual form of death, but overall there was a significant benefit. The article also reads that:

"For every 1000 people treated with thrombolysis 41 avoided death or dependency. Treatment within 3 hours resulted in 95 out of 1000 fewer dead or dependent people. Trials using intravenous recombinant tissue plasminogen activator (rt-PA), contributed the most data to this review. Nevertheless it was associated with an excess of early deaths, virtually all attributable to fatal intracranial hemorrhage (ICH) and a significant excess of symptomatic intracranial hemorrhage, but a neutral effect on deaths by the end of follow up,

He said other drugs have been used experimentally." He agreed that this was not a magical drug but a modest one. He said he would like to imagine that for the actual drug that they use the figures would somewhat be better." He cannot say how much better but somehow better than the 95, it might have gone up to somewhat over 100, that he cannot say but it is still considered the most efficacious of the thrombolytic. It was put to him that the rt-PA which is the drug Kesler used was actually involved and contributed the most to the Data. He agreed that it was included and added that probably the numbers that they gave 10 000 included some trial but were not included in the paper. He thinks they were somewhat less, maybe 3 000 roughly less. So he is not sure if those 3 000 were a combination of Alteplase and other drugs.

[96] He was referred to Lancet Publication marked D5 on the same kind of literature to an article on "Risk of intracerebral hemorrhage with alteplase after acute ischemic stroke: a secondary analysis of an individual patient data meta- analysis." He referred to a part where it reads:

"Among patients given alteplase, the net outcome is predicted both by time to treatment (with faster time increasing the proportion achieving an excellent outcome)

and stroke severity (with a more severe stroke increasing the absolute risk of intracerebral hemorrhage). Although, within 4.5 hour stroke, the probability of achieving an excellent outcome with Alteplase treatment exceeds the risk of death, early treatment is especially important for patients with severe stroke.”

[97] According to Lancet Publication about 6756 patients pulled the Data in the nine trials of intravenous Alteplase versus control. It was put to Kesler that the significance and helpful control is because here one can actually see and take into account what the state of the patient was on presentation. And not everything lumped together but broken down into 3 components. There one can at a glance see the outcomes, the three components as to looking at this schedule from the left. The expected outcome if not given Alteplase, is the control. Kelser agreed. The expected outcome given Alteplase within 3 hours in the middle, and the last one given in 3 to 4 and a half hours. The three components are then (1) the mild or a very mild stroke which is the NIHSS 0-4, And the middle lot NIHSS 5 -15 and then serious stroke NIHSS more than 16. In response he said in general, he usually does not treat patients who are 4 or under. He agreed that a lot of people were treated and commented that he thinks in the beginning, the trial did not look at severity and those guidelines were only added somewhat later after analysis of the various trials, where it is now recommended that patients with very mild strokes signs those under 4 and symptoms should probably not be treated. He confirmed that the 1,2,3,in that page which represent the outcomes in Rankin Scales 1, 2, 3, 4, 5, 6. Along the side he had the NIHSS score scoring 0-4 on the left hand block and 5-15 on the middle left hand block and greater than 16 on the lower block. He counted the little numbers and transposed it into one document which is workable, which is the Whiteley Lancet. It forms part of the synopsis which says, “Patients with mild signs of stroke per 100 patients.”

[98] He was referred to Lancelot Publication pages 10, 11,12. 11 is the one that deals with the middle range and moderate signs of stroke in the scale 5 to 15. He agreed that that is where he has placed Evans. It was put to him that if he adds those it shows no tPA at all. The Placebo 35 out of 100 patients would have recovered to that level according to this study. The same within 3 to 4 and a half hours 40. Then of the patients that would have been left with a slight disability 16 without any treatment at all. 15 within the 3 hour period. If this type of thing comes up there is actually more patients who will not be treated who would be 16 that would end up with a Rankin scale of 2 whereas if they are treated only 15 ended up in that range. Kesler agreed that it is what he has picked up from the literature. He said they are not actual figures but taken from the raw data and in a sense manipulated through statistics to give an indication of outcome. He said he does not know how they put it there, but they are models. He says he is not surprised that there is another formula. And That 16 and 15 are pretty similar. He noticed in one case it was also reversed with deaths. He said there were more deaths in the group in one of those things in the group that was placebo as supposed to those that got the drug. That did not make any intuitive sense and was just part of the problem of the modelling that is that. He said in general he accepts that. It was put to him that he has got to accept that there are numerous patients doing well or even recovering and this is what it is all about, without any treatment whatsoever. He agreed that it is what they experience clinically after all not long ago they did not use tPA and many of their patients recovered exceptionally well, mildly well, somewhat well. He said that it is not surprising at all. It was put to him that there is a marginal increase of benefits to some patients but it is not a miracle cure but modest compared to the controls. And he accepted that.

[99] He was referred to figures of 32, 33 and he responded that he was not so cognizant of that when he was reminded that the previous day he looked at those figures of 32, 33 and it occurred to him that they look at different things. In the one they say a third of the patients have improved and the third of patients do better than they would have, had they not received the drug. Which is very different to this because in that group all they are looking at is an increase in one or more in the Rankin scale. So what they are doing in that paper they are stratifying it into different Rankin scale, whereas in the statistics that he quoted before they just said well if you have gone from a Rankin 4 to a Rankin 3 you have improved, slightly looking at things in a different way. It was put to him that the agreement that was reached ties with the little graph in his report annexing a scale at the back which says he has to treat 27 patients of 100, 27 will look better without giving an outcome only stating slightly. He said that was the first meta-analysis that actually looked at stratifying Rankin scales as an outcome and in a sense confused him he did not quite see that as well the previous day. So he agreed that it was a more refined version but modest. He argued that it was stratified and that if he improved from a 5 to 4 in the paper that they were looking at it would not count. She will still be in the bad group. Whereas if he happens to be a 2 and he stayed at 2 or he happens to be 1 and he stayed at 1 he is then included in the group in this paper that Counsel was referring to. So if a 1 and he got treatment and he stayed a 1, then he was included in the good group. Whereas in the previous papers that they looked at it was simply looking at anyone jump to 2 or 3 as better. He said one can still be a lousy outcome.

[100] It was put to him that its worrying where he got his figures in his report where he states "of every 100 patients treated with thrombolytic therapy 32 will have a better outcome and 33 will have the worse outcome." He replied that, that was just a quote from some paper which he obviously did not remember or refer to. He was informed that it was a Medscape article. His response was "Oh thanks for saving me at least I did not suck it out of my thumb" it comes from somewhere. It was put to him that him and Rosman were in agreement as well, about the 32 and 33 which is about a third. And that it is therefore very refined and the rule of thumb. He was asked as to why would he place Evans as one of the 33 not the 66. He agreed to a suggestion of it in a way being a game of lotto or in a sense horseracing where the odds are you know the favourite coming in, but the plunker at the back can actually win the race. He apologized for the outburst he had the previous day. It was put to him that he did not want to say or accept that the probabilities dictate what the causation is. If it is more probable than not that she would have been cured if it would have been eventuated. That is the test. He responded that it was not more probable that she would be cured. It was pointed to him that he has withdrawn the statement. He said he is so sorry that Counsel is talking about more probable than not. They indeed knew what the figures state and at its most generous would be a third of patients will show some form of improvement. Counsel put to him that that is the case they have come to court to meet. (The odds high) which is still is the case in his mind as well. Kesler accepted.

[101] On the Rankin scale he said he can put Evans anywhere between 4 and 22, as he has not canvassed the figures and thereafter apologized that he was referring to the NIHSS mixing them up. On the Rankin Scale score he said he will place Evans at 4 which might be a little bit harsh, because she does not fulfill all the criteria of 4 but if she was put down to 3 he could accept that but personally because of that caveat "but able to walk without assistance" he chose to put her to 4. He was referred to an article by Rosman explaining the workings of a Rankin scale D8. It is in an open Rankin guidance document, publication by Pofessor Kennedy

Lee, a Professor of cardiovascular medicine, Institute of cardiovascular medical sciences, University of Glasgow. Kesler confirmed that he knew the author, a known expert. Lee's article says acute stroke trials require a robust measure of function of outcome. The present modified Rankin scale MRS is the most popular outcome measure. There is a score of 0-6 which he sets in a tabular form and that correspondence with D2. Some of the concerns under that insert some interrupt or variation of observers often disagree even when assessing the same patient. His explanation of how to go about scaling a patient according to Rankin scale is that; The score of 0 is awarded to patients having no residual systems after their stroke, not even minor symptoms. Which is a complete cure. A transient ischemic attack is something which would be a typical 0 score after the event, then there would be no symptoms, no signs left within 24 hours of the onset clearing off spontaneously. He also agreed that then Lee spoke of a score of 1"

"If patients have any symptoms resulting, whether physical or mental they should be scored at least at 1. So 1 is good but there is some residual... for example if they have any new difficulty in speech, reading or writing, in physical movement, sensation, vision or swallowing or any changes in their mood that does not limit the activities, they still should score 1. So in other words it is actually a bit of an over statement to say that Rankin 1 is a perfect outcome. But it does not inhibit that their activities are limited." The patient in this category can continue to take part in all their previous work, social and leisure activities. For this purpose usual is regarded as any activity that they use to undertake for on a monthly basis or more frequently.

[102] Regarding the Rankin 2

"If there is any activity they used to undertake now they can no longer do since the stroke, whether because of physical limitation because they have chosen to give up activity as a result of the stroke they should be scored 2 on the Rankin. In this category. The patient here has a slight disability and is unable to look after all its own affairs without external assistance. For example a patient has slight disability and is unable to carry out all its previous activities, but still able to look after all its own affairs without any external assistance. If can no longer do sport or work or do the same job. The Patient will still be able to look after himself without daily help. He will be able to dress, move around, eat, go to the toilet, prepare simple meals, undertake shopping, makes short journeys by himself. And not require any supervision from other people, he should be left at home for a job of a week or more without any concern. Inability to drive only become a problem because of a legal impediment where the participant is otherwise physically able to do so would not warrant a score of 2."

[103] He confirmed that this is in general agreement and of his understanding as well. In Ranking 3 category is of patients with a moderate disability: "Patients require some external help for daily activities but are unable to walk without assistance and they use a stick or frame for walking, but the assistance of another person is not required for this". Kesler agreed that that is where they parted ways in his testimony the previous day. He says he was not aware that is what it meant and has always thought the patient who were unable to walk independently are those who required assistance not in terms of human assistance. He said well it must be that Evans is Rankin 3_which is where Rasman said he would have put her as well after listening to the evidence.

“The patients will be able to manage daily activities such a dressing, toileting, feeding etcetera but will need help for more complex tasks such as shopping, cooking and cleaning will need to be visited more often then weekly for some other purpose. Simply the advisory for example supervision for their financial affairs. Patients then...”

Regarding Rankin 4 Patients with moderate, severe disability, they were unable to walk without assistance and are unable to attend to their own body needs by themselves, meaning without assistance. They are not independently mobile and will need help for their daily tasks such as dressing, toileting and eating. They will need to be visited at least daily. Need to live in close proximity of a helper. They differentiate patients in category 4 from those in the most severe category one has to consider whether the patient can regularly be left alone. For moderate periods of a few hours during the day. Kesler confirmed that it is not Evans they are talking about.

[104] Going to the time scale and having dealt with onset. Kesler confirmed that they can work on the assumption that onset was at 10h00 although difficult to pinpoint it to the minute. It was put to him that the first intervention by a Doctor was at 11h15. The note says Sim saw the patient which was an hour and 15 minutes into the window period. Which leaves 15 minutes before the 90 minutes window of opportunity expires, which is cutting it very short for Sim to be able to first examine the patient. If he did the job properly he would decide that what he must treat was a stroke, arrange for a CT scan. It must be done and reported on. Get the results of the CT scan which is peremptory and should come out immediately with the radiologist there. Then contact with a physician arranged. As is a position of practices, it was confirmed that there was a physician in the premises especially Wilgeheuwel. The agent will have to have been obtained either from the pharmacy or locker and then infusion started. It was put to him that Rosman said if he was called for a patient in that condition he would rush to the bedside of the patient himself. He would advise over the phone. He was asked for comment and if that is the common sense that Le Roux might probably also had followed the same if he had been contacted. Kesler confirmed that preferably he had to be there to assess the patient rapidly himself and first of all make sure about the diagnosis. Since this is a special field of Neurologist even though Physicians do treat to a certain limit. Evans was eventually send to Shamey who is a neurologist. Bed space would then be needed in the ICU that need to be arranged.

[105] Guidelines say that it must be administered in the ICU. It was put to him that Rosman also agreed that you can start the infusion in giving the bolus injection as he has stated in the emergency ward or cubicle. And as you do that the patient will then have to be wheeled to the ICU. He agreed that is true. The availability of a bed being a factual issue depending on the circumstances. The question was on the whereabouts of Le Roux. Was he going to be able to immediately attend to Evans at that time or was he busy with another patient at that moment. He agreed that that was speculating. It was put to him that there was no chance that Sim would have beaten the 90 minute. He agreed that time was certainly very tight for Sim, assuming they were talking about the 90 minute window period and the 10h00 onset and not 10h10 or 10h15 which would have given them another 10 to 15 minutes but would be too tight in the scenario of 10h00 to expect any reasonable response. He responded that if he went through the emotions of expediting the scan which takes 2-3 minutes to get the written results and from the radiologist a verbal response would suffice. He admits that time was tight but if treatment could be started if things were right within 15, 20 minutes.

[106] Time was tight and there are things that they did not know. The availability of Le Roux was uncertain and he was not fused about the availability of a bed in the ICU. If the patient was under the supervision of a Physician and casualty officer then he would give treatment. It was put to him that he was speculating in favour of Evans. If it was speculated that Le Roux was possibly not around, he must be given a reasonable time to respond. It was put to him that on all the evidence the probabilities dictate that she would have fallen into the after 90 minute in the second category before 3 hours. He said whether it is 15 or 20 minutes or 25 minutes that is left, one should not throw arms and say they have missed the boat because they are not going to catch it in time for the 3 hours. It was put to him that he could not go that far the best he could do is to say within 3 hours as Rosman did. And not try and break into the 90 minute. He said even so that would not necessarily stop the clock. It was put to Kesler that his own document says that there is a difference with outcome in the timeframe scale but he chose the best one for his case. They told him he should not do so he should actually take into account the probabilities submitted that chances that she would have had a needle in her within 90 minutes are non-existent. It would more probably been in the second half of the 180 minute window. Kesler agreed that it would have been in the early part of the second half. He said again that is stratification into sort of 5 minutes intervals has not been carefully looked at. So in a sense arbitrary, not whether it is 90 or 95 minutes. They are just how many times the numbers go around on a clock 90 minutes being an hour and a half. He indicated that the type of stroke suffered by Evans was found out in retrospect that it is called Vertebral Arterial Dissection and would have caused the ischemic occlusion somewhere in the brain. He said Evans stroke has got no similarities to other cases that seem like stroke but were not, Evans was a very typical onset of an ordinary ischemic stroke. That suffered from an acute stroke. The unusual part about it was that it was a brainstem, a little bit more that it was a dissection would also be a more unusual, pathophysiology of a stroke and suffered only one stroke. It evolved over a matter of minutes or at most probably an hour but it is not A typical. He confirmed that by the time she was seen by the Doctors the stroke has occurred and the fluctuating position thereafter was an effect of the stroke. Getting worse overtime.

[107] Responding to a question as to when it would have completed he said there is a pathological happenings within the brain. So the blockage of the artery presumably happened very rapidly to stop blood flow in that area giving rise to lack of blood and then that sets off a cascade of events of ischemia which is lack of blood and oxygen to a dedicated area. There will be an area of total ischemia where there is virtually no blood and oxygen getting into the area and then surrounding area which is relatively not absolutely ischemic. It is that area that under non-tPA circumstances is often salvageable and will heal on its own. There being progression in time and difficult to say in a common or garden stroke exactly when it is complete. But would think it would be in a matter of hours but not days. He was asked about the literature by Botha that talks about progression instead of stroke to a completed stroke therefore dealing with a stroke in progression or evolution which is completely different. He responded that he does not think that is what Botha meant. But means that in the normal course of stroke there is some evolution, but which is not the same thing as a stroke in evolution which in the case of the previous case was stuttering and starting and improving and in fact in her, deterioration took place over days, certainly not in minutes or hours. It was put to him that Rosman said by looking at the outcome of the MRI on the 10th one actually pick up that this was not a stroke in evolution or an evolving stroke because of the area that was affected was contained and very small. He agreed with that. It was put to him that stroke

doctors would speak of a posterior circulation stroke, that is the affected arrears at the back of the neck and the medulla oblongata and the serebellum and the anterior stroke would the carotid arteries in the front of the neck area that would be the origin of the occlusion which would be a much more common stroke and the ones that are excluded or blocking the carotids. Kesler said he is aware of the literature that refers to carotids or the circulation strokes which are the Vertebrals. It was put to him that they are less likely to be treated successfully with Alteplase. In other words it is not looking that the outcome will be less favourable than the other, in another situation.

[108] He was referred to literature with heading "The thrombolytic treatment of patients with acute ischemic stroke related to underlying arterial dissection." It is the underlying arterial dissection so it does not seem to make a difference to arterial or posterior concluding that "the adjusted rate of favourable outcomes is lower" and deals with thrombolytic treatment "is lower amongst patients with ischemic stroke with underlying arterial dissection following the thrombolytic treatment compared with those without underlying dissections." He said he was aware of that literature and what he did was to see whether the dissection was a contra indication. He found artives that said it was not a contra indication. It was put to him that Rosman said the way of thinking changed over time changing the state of medical knowledge on that very issue. It was put to him that initially, in the early years of thrombolytic treatment after it came out, practitioners did not administer thrombolytic treatment to a dissection, arterial dissection stroke. He said presumably if they knew that, because that is not always obvious as it is a rare condition. There might well be dissections included in some of those figures, in some of those sample sizes, which were known about until later. Kesler agreed that they were concerned and so they did not administer the thrombolytic treatment and apparently it took some years before the state of knowledge was such that they accepted that there is not contra-indication. He agreed that because that would have entailed if he wanted to exclude a posterior stroke, doing the MRI most probably right at the beginning and not a scan. It is only in later years that it has changed, but it is difficult to say whether by 2011 there was already acceptance. It was indicated to him that the article says the outcome is less favourable, they do not quantify it. He accepts the validity of the argument that a finding will have to be made at what the probable outcome would have been had Evans been treated. There being two choices that obviously must be taken into account but because of the origin of her stroke she should rather be put into the less favourable category except it is not really quantified nor do they differentiate between anterior and posterior circulation. And the numbers, if the numbers are reasonably small then the validity becomes less valid. Only 1% out of 488 patients would have this type of stroke.

[109] The CC decided in a Rugby matter (this is in reference to *Oppelt v Head: Health, Department of Health Provincial Administration: Western Cape* [2015] ZACC 33) that the validity of the study was too small as only 39 patients were involved which they agreed can be argued. It was a retrospective analysis as well not by the doctors who treated the patients at the time when they gave the patients Alteplase, which Kesler said it makes sense and cannot think of a patient that he has treated who have been found to have a dissection he said he does not have the experience. He confirmed that in the incidence of the administration of thrombolytic treatment in stroke there is not a very huge figures involved in South Africa even in his own practice it is pretty low 4,5 per year. He said there is more confidence now and obviously and that does not apply to the situation so many years ago in 2011 (8 years ago) but it is done most frequently and much more confidently now than it was

before and he is not involved in every single case any longer. Whereas in the beginning he was involved in every single case. Therefore it is picking up but over South Africa the figures are small which is also due to logistics of getting the patients to hospital, patients kind of not taking any notice of the onset of their symptoms, thinking it is going to go away or going, wasting time by going to their GP first. Ambulance services taking people to a centre which does not offer it. So there are lot of logistical problems one would intuitively understand, it is the time limit. Patients often come out of time.

[110] Reference was made to D9 an article called "thrombolytic treatment of patients with acute ischemic stroke related to underlying arterial dissection in the United States." And published in December 2011 in Arch Neurology. He was asked about the first manifestation of the onset of this type of stroke, in this that starts in the posterior vertebral artery. It can be variable so it can be anything within the posterior circulation which could involve for instance cerebral tissue and that would almost invariably affect vision, because the visual cortex at the back of the brain is supplied by the posterior circulation. It could affect the cerebellum, which is that organ at the back of the brain which is concerned primarily with co-ordination and balance. And then it could affect any part of the brainstem. The upper brainstem which is called the midbrain. The middle part of the brain stem which is called the pons. And the lower part which seem to have been affected in Evans' case which is the medulla just under the part that affects balance. Vertigo can be a sign of brainstem involvement. On p107 Bundle C there was Verbose Medication that Evans told the Doctor she was on. He confirmed that Library Verbose is an agent given in Vertigo it is called Betahistine and it is a drug that is used usually in peripheral vertigo. That arises in the middlefront from the inner ear rather than the brain. It is a schedule 3 drug which means it can only be obtained by script from a doctor. The presence of Vertigo is an indication of a posterior dissection of the artery being involved but not on its own. But certainly can be part of a stroke syndrome in the posterior calculation. He said the headache is not as common as one would imagine in ischemic stroke. It is very common and often severe in hemorrhagic stroke but they often see patients with quite severe strokes who have a headache which is an invariable symptom and often not prominent or severe. But in the case of dissection it may be that the dissection began some time before the stroke. In most cases of dissection they do find some sort of history indicating what set it off. And that is fairly a minor trauma like a whiplash or a fall. He has seen in patients who have manipulation by chiropractors, patients elderly patients who have back wash hair dos. Dating back when it was roughly a week, two weeks, three weeks before the event. So headache under those circumstances, especially posterior headache, neck pain which does not have to be particularly severe, it can be mild and nonspecific. But it is not uncommon in dissection to have neck pain and headache. It may well be the first sign then that the patient is no longer well but not the first sign of stroke. So although the bisection has begun the stroke has not. He was aware that there is a note that she took Dispirin, Comporal and Panado at 7h30. He said Compral just a combination drug of a little bit of parasetamol, which is Panado and a little bit of aspirin. He is not surprised that there was some headache as the history had suggested that for some two weeks there was some headaches, He is not sure if Evans remembers the details of that, but that would not surprise him given that we now know there was dissection that suffered from neck and posterior headaches. That being the mechanism of the eventual stroke. In the same way that somebody who got a big plaak in the carotid waving in the breeze. The mechanism of a stroke is that it breaks off and flows and blocks a vessel. And maybe without knowledge the dye is set, but that is not the start of the stroke.

[111] In re-examination he said he is aware of a product known as Ventease it is usually in an aerosol pump and its used for broncho spasm and asthma. There is a note that Evans suffered from asthma in the past. On the difference between signs and symptoms Kelser said what the patient tells you are the symptoms, that is extracting that from a patient having asked them, the headache, toe is painful. So they do not usually come out initially in the history. What you can perceive from looking at the patient formally and informally by watching the patient walk in, watching the demeanour while they are giving you their history and formally examining them on the examination table, those things are called signs. He said you get symptoms and signs. The one is subjective and the other objective. He was asked that when Evans presented where would he put her on the Rankin scale. He said the Rankin scale is not used when someone presents but is an outcome. It would be used depending on one's trial after six, three or one month or one week but it is not a baseline scale that you use for when a patient comes in.

[112] Kelser said if Evans remained as she was when she presented she was a lot worse off. She was unable to get up and walk. She appeared to be a bit confused, mildly confused had a flaccid arm or very weak left arm. She could not bear any weight. Her leg was significantly weak and it is not clear that the doctor actually examined the sensory system absolutely, but can assume that the symptoms were the sensory signs of numbness and altered sensation on the left side. And if she remained in that condition for three months she would be a 4 or a 5. He explained that a gross sign is the severity of a sign. It would be a gross sign if their arm was paralysed and they could not lift it that would be a gross sign. But there are subtle signs as well. So if the arm was just very slightly weak and almost no weakness in their hand, but had very impaired fine movements. So when you test their strength grossly it may be normal, but when you ask them to do something very fine or rapidly they cannot do it. That would be a more subtle sign as supposed to a gross sign. It is just a matter of degree. He was asked that based on what he heard from the three witnesses about Evans if those were all gross signs or were her weaknesses. He indicated that the doctor who wrote 3 out of 5 was referring to a substantial weakness and not a sign. The doctor would test the strength and that would be a sign. A clinical test is needed to test a gross sign. It is part of an examination it cannot be perceived. So if one had a patient lying in bed who has had a stroke and you do not lay a hand on them or patella hammer they may appear to be absolutely normal. So the patient has to be examined, testing the power, tone, strength and sensation. These are all to elicit the signs. Gross signs include what a lay man can see that a person cannot walk and collapses that the eyes roll back and talks with a slur. For many gross signs would be spotted perhaps not interpreted but spotted by a lay person. But it is not limited to that it must include examination.

[113] Asked about the person being on 91 or 181 minutes on presentation. Kelser testified that they put into categories because they are trying to show what the trend is and clearly the trend is the longer you wait the worse the outcome is, and so they do that in arbitrary groups of 90 minute intervals. They could well be easily be 48 minutes and 48 and half minute intervals. If one is in the wrong zone by one minute or two minutes it cannot make a huge material difference. He said if you are 91 you in the same category but with a different outcome. A ballpark figure. He was asked if Dr Sim was left with 2 to 3 minutes to have done something within the 90 minutes if up to 5 or 10 minutes he would still apply this treatment if it not contradicted. He said up to 3 hours he would. He said it was out to him that because of delay and time sequence Evans would then have fallen into the 90 minutes to 180 minutes.

He said he would not be fussed by a 5 or 10 minutes delay having started the process of going to the trouble of getting an urgent scan, calling the doctor. If there is going to be a short delay that would not deter him. Indeed even after 3 hours if he was he would have tried to get the whole thing done. **If it was 3 hours and 5 minutes or 3 hours and 10 minutes he was not going to exclude the patient. He said he certainly would not include the patient at 4 hours and half hours.** He however supposed that ballpark figure is a reasonable term. He was not sure as to when the Doctor Ndlela was involved however knew that she came on duty somewhat later and obviously took over and does not know when that time actually occurred. He said when a doctor takes over there would be a hand over a typical thing would be in an emergency unit, you presumably been on for quite a long time. But would hand over cases that have not been discharged who are still lying in casualty, waiting for somebody or entails walking from bed to bed. Most casualties do not have a huge number of beds so they may be six or eight cubicles or whatever. And the doctor could go from one cubicle to another with the doctor who is going off duty who will hand over saying this is Ms Evans who came in with this and we are waiting for results, and then take over, depending on the nature of the problem.

[114] In respect of a patient who comes in because he has got a boil and the handing over doctor was waiting for a surgeon from the Lancet, a full complete examination of that patient would probably not be indicated. But if the doctor had a patient who is kind of half paralysed lying on the bed, with a reduced level of consciousness when taking over the doctor would want to kind of go over that and check things out for him or herself as well. He indicated however that it is the duty of the doctor handing over to prioritize which requires the most attention which will perhaps not be when the note is made. He said Ndlela was almost given incorrect information as well and the papers that was generated by the previous doctor will form part of handover. The record stays and would be part of the current notes. So Ndlela should be as informed as Sim was on the paperwork. With a good handover he should be able to give her most of the salient details of what is going on. He said in this case the first doctor Sim was clearly at sea.

[115] On Exhibit D3 Hacker 4 referring to the bold print of 0-90 minutes and the total Rankin 0 -1 as a good outcome and get total Rankin scale of 0 death a bad outcome. Also a heading with or without treatment. There is an Alteplase which is with treatment and below a Placebo which is without treatment. In the next column there is Rankin Scale 0, Kesler agreed that if one treats somebody one gets 22 best outcome results. And if one goes down without a treatment one gets 10. That is more than 50 % better. It was put to him that if one acts expeditiously on these statistics that Counsel relied upon, there is more than 50 % chance of a better outcome. If it was 20 to 10 it would be 50 % but 22 to 10 is more than 50 %. He was then referred to the Cochran Library document D4 under Discussion on the Summary of result where it is stated that "There is a neutral effect on the deaths by the end of the follow up and significantly more people avoiding dependant survival." Counsel said he assumes the word significantly is used statistically. Statistically significant. Kelser was also referred to a sentence that reads: "However dependency was reduced in survivors. So overall there was a significant nett benefit."

[116] Then he was referred to D8 the document titled "How to perform Modified Rankin Scale Assessments" by Sits Open Rankin Guidance Document (2014): where it defines Rankin scale 3 as that of patients who have moderate disability. It says these patients will manage daily activities such as dressing but are able to walk without assistance. They may use a stick

or a frame for walking but the assistance of another person is not required for this. They will be able to manage daily activities such as dressing, toileting, feeding etc. But will need assistance with shopping, cooking or cleaning and will need to be visited more often than weekly for some other purpose. Kelser was asked that since they have kicked out the question of walking with assistance to say it must be human assistance, whether Evans will not be a Rankin 3 even though she cannot manage daily activities such as dressing. His response was that if a patient can do less than all of it who can neither do 50, 60 or 70 % self- dressing, less than all you go to the highest or worst category. He said Evans was totally dependent with regard to dressing and probably feeding she would not be able to cut up her food. "To be category 3 one must be able to feed oneself". He said Evans could not cut food in the conventional way of putting a knife and fork therefore another reason she should not be a Rankin 3 category. It was put to him that the article says that to distinguish between patients in category 3 and 4 the crucial question is whether the Patient can walk without the assistance of other people. If he is dependent on others in activities of daily living he must score a 3. Finally if there is still some doubt between two adjacent alternatives on the scale, and both options appear equally valid, then the worse option should be chosen.

[117] Now dealing with arterial dissection. Kelser said he could not understand what was the concern, but they have arterial dissection and there is a difference between the front and the back. The concern about that was the hemorrhage within the blood vessel itself. He explained that what happens in dissection is that the wall of the blood vessel which is in layers dissects off. So part of the layers of the wall, some are longitudinal, up and down, some are radial, round and round. Along the tube there is a slight break in the wall and blood tracks into the canal, it dissects off the wall. The blood will then push the lumen of the wall closed over time and when that reaches a critical point, like a complete blockage one gets the stroke. And that process can take days or weeks to happen. But he said he would imagine that the concern was that the blood that has tracked into the wall of the artery would create more bloody mess in that artery. But that was not found to be the case. There was fear that there would be hemorrhaging indicative of the weakness in the artery. There was concession made that that was quite vague and it did not stipulate exactly how much nor did it look at the comparison between anterior and posterior circulation and nor where the number very significant, the less the smaller the sample is scientifically the less valid. So not having studied that paper Kelser said he will agree with what is said in the paper. But the way it was put to him was a bit vague as to how much deficit or how much worse those patients' outcomes were but accepting it.

[118] He testified on his personal experience, that he used to be involved in each and every case because there was some fear in using thrombolytic therapy, so a neurologist was called for all possible strokes that came in on time at his facility but not anymore. His rooms were in the precincts of the Hospital in Kingsbury and his home 5 minutes away. He would go down as rapidly as he can. Sometimes when called he would go down and examine, make a decision, talk to the family and decide on what further to be done. But now some of the younger newer physicians who have come on board are happy to use the treatment. They were confident and had some experience and in that particular case he was happy with that. However he would not encourage it. The 4 to 5 he was talking about they become his patients, often the first time he meets them is in the casualty.

[119] The court questioned the Doctor about the Rankin scale on Evans that he initially said it was 5 and then seemed to agree that it was 4 as to what exactly is his opinion. He said the

Rankin scale is not actually used in the acute situation. It is an outcome score in the trials and in clinics because it is quite an easy scale to use. It is used to see the result of the stroke, not necessarily treated particularly. As she is now it is as he understood some debate as to whether Evans is 3 or 4. He said he was persuaded that it was a 3. But his counsel has pointed out that her difficulties with dressing and feeding would actually slip her back into the higher category. And the rule as the counsel understood it is if there is some controversy, because there are quite a few factors the one goes for the higher group. In other words one would put her into a worse group, if she fulfills some of those criteria but not all. He said his final Rankin scale would be a 4, which is where he started.

[120] He was referred to the document that was referred to by his Counsel D8 where in the context of that whole group of people Counsel states that it refers to people that cannot look after themselves if you read it carefully, it states that:

“patients with moderately severe disability who are unable to walk without assistance. Unable to attend their own bodily need by themselves were given a score of 4. These patients are not independently mobile and need help with daily tasks such as dressing, toileting and eating.”

And therefore need constant attention. He responded that there must be a range because there are quite a few different factors, some of which the patient may be able to do perfectly well and others not. At the bottom of the page 9 on D8 its stated that:

“if there is still some doubt between two adjacent alternatives on the scale and both options appear equally valid then the worst option should be chosen”

Counsel referred to the fact that the Rankin 3 uses a stick or a frame for walking, but the assistance of another person is not required for this. They will be able to manage their daily activities such as dressing, toileting, feeding, et cetera, but need help for more complex tasks like shopping cooking and cleaning. He argued that helping somebody with a shoelace or a button once off is not constant caring for him and not the context within which it is stated under 3 as supposed to 4 where constant assistance is required. He responded that there is a controversy. If there was a group in between then he would probably put her at 3.5 but he is prepared to leave her at 4 being the worst group of her difficulties with those particular tasks. He indicated that Evans has got a helper who doubles up as a domestic help but requires her carer for helping with buttons and dressing and perhaps putting on her bra or jewelry doing up little things, laces and requires assistance to cut food, clean, help you shop which is not totally independent. He even when we look at 3 at someone that needs someone to cook, clean and shop Evans cannot do those things and its a 3 but it will also be a 4 as people in 4 would also not be able to do that.

M J Van Nierkerk

[121] The next witness to lead evidence on behalf of Evans was Dr Jeanette Van Nierkerk (“Van Nierkerk”), a statistician who has compiled a statistical report identified as Bundle B page 1470. Her attention was drawn to page 1468 of the report that states that:

“which is timeously given thrombolytic treatment such as that forming the subject matter of the dispute between the Plaintiff and the Defendants in this case, having an improved outcome after suffering a stroke such as that forming the subject matter of the present litigation are the following:

1. A 280 % higher probability of an improved outcome compared to no such treatment if the thrombolytic treatment is administered within the first 90 minutes of the onset of the aforementioned stroke.
2. A 160 % higher probability of an improved outcome after suffering a stroke aforementioned if treated with thrombolytic treatment within the period 90 to 180 minutes after the onset of the stroke.

She indicated that the conclusions were made from that reasoning. She confirmed that she is not qualified in the field of medical research and did not conduct the research which is referred to as Annexure B but looked at the annexure from a statistician point of view. Annexure B is the publication in the Lancet which is one of the top journals internationally where medical results are published underpinned by very involved and proper statistical theory. She explained that she used the word Meta- analysis which means an analysis conducted on various different independent studies that is usually done in medical trials so that there can be a concise conclusion, by taking the research work that has been done and try and resolve at a result of what the overall picture of that research is.

[122] She was referred to paragraph 1 where she deals with the question of 2.80 times more likely if thrombolytic treatment is given within 90 minutes of the onset of the stroke and 1.6 more favourable if treatment is given within 91 to 180 minutes. Giving methods and findings and she said both figures are mentioned in the paragraph. And also states that “for example the odds ratio of a favourable outcome for patients treated with rt-PA, compared with controls was 2.81 for those treated within 90 minutes and 1.55 for those treated within 91 to 181 minutes.” Kesler had criticized that approach saying it is incorrect to say that there is 280 % increased chance. She explained that the odds ratio is used to compare two outcomes and is basically the ratio of the odds. It is an indication how much more likely a certain outcome is, under a certain treatment plan, than with another treatment plan, which is often the control. If one group has a 1 out of 10 chance of having this certain outcome and the other group has a 3 out of 10 chance then the odds will be 3. The odds ratio is not calculated using percentages it is based on frequencies. So the explanation that the aforesaid 2.81 and 1.6 times equate to respectively 280% and 160% higher probability of an improved outcome with thrombolytic treatment.” She explained the percentage that there is 280% higher probability of an improved outcome it simply means that there is 2.8 times a better chance of an improved outcome with the treatment than without the treatment. She also stated in the report that: “it is common in statistics to do a meta-analysis since it culminates in a number of studies into one concise conclusion” and you say also “the Literature pertaining to thrombolytic therapy is fast and in such cases a meta analysis is needed in order to achieve a culminated and concise global conclusion and that this is what was done in Annexure B hereto.” She confirmed that she deals with statistical analysis principals applied in Annexure B and do not find any fault in which they have been applied. They accord with internationally accepted practices. Therefore had concluded that “the conclusions reached are statistically reliable”

[123] The D5 on the risk of intracerebral haemorrhage with alteplase was mentioned to her. She confirmed to have seen the document and read it for further comment, and that it consists of information transposed by Mr Le Grange from other documents and a table that is D3 saying Hacker figure 4 based on the 2004 article.

[124] Under cross examination by Le Grange it was put to her that in her summary she does not explain the Odds Ratio but instead it talks about probability of an improved outcome rather than an odds ratio. Her response was that, that is what the interpretation indicates. The odds ratio is used as a measure of association between certain treatment protocol and a certain outcome. She was asked in real patient terms what she meant if she says there is odds ratio of 280% having 100 patients who are treated and 100 that are untreated. Her answer was that the 2.8 odds ratio would indicate that for instance in this context what it is being dealt with. If in the placebo group or in the control group they were 10 patients with a better outcome of the 100, then this odds ratio translates to a 1. There is an odd ratio of 2.8 that then translates to 28 patients out of the 100 in the treatment group with a better outcome, meaning 28 out of the 100 patients will be better as supposed to 10. So the odds ratio definition was not the correct definition because there the relative frequencies used. Whereas the rule frequency should be used, because if there is a different sample sizes for your treatment group and for your control group that you have to take that different sample sizes into account. And if you work with your relative frequencies then that is not taken into account. It was put to her that in Annexure B they have adjusted odds ratio and the argument used in the document is whether one should use the one or the other. She said she is not equipped to make an opinion as to the correctness of the adjustment. She was asked for the reason why the unadjusted odds ratio was 1.96 and now it is stated to be 2.81. She said she read it in the article but cannot conclude if it is necessary or not.

[125] She confirmed that 161 patients were treated as opposed to 150 non-treated placebo control patients. And the unadjusted figures for the next group which is the 91 to 180 minutes group was 1.65 and adjusted downwards seem to be 1.55. They were dealing with the comments on the foot of the page that deals with the treatment odds ratio and with the next heading of adjusted and unadjusted and then a reference to intervals. The minutes of treatment and then it is rtPA. Counsel indicated that from what she has testified so far she has referred to where the patient was treated with the thrombolytic treatment. With 161 patients involved and an adjusted figure of 2.81 that she uses and 1.96 which is the adjusted figure, odds ratio. In the article somebody has argued that it should be adjusted to 1.96. Also under the next heading of 91 to 180 minutes and again treatment there with 302 patients, the adjusted figure was 1.55 and the unadjusted figure was higher, so it was adjusted downwards. If they go down to 180 to 270 there again is an adjusted figure 390 patients treated and 411 not treated or control patients. The unadjusted figure was lower than the adjusted figure and upwards and the last one also upwards. She said it is the statistical exercise that was done.

[126] She was asked about the Rankin scale that says 0-90. The patients that were not treated but given the placebo. Dr Kesler had alleged that they were given the medicine, albeit blindly, and do not know that they do not get the right medicine. Of those 10 of the 100 who took that Placebo 10 recovered fully. 19 received to the extent that they were in a good condition, otherwise it is a 1. Then the scale goes to the other side towards death, getting worse and worse. Then with treatment there were 22 who ended up in the 0 as supposed to 10 that being a difference of 12. She said to get 2.8 they have multiplied 2.8 with 12 and the total is 33 which is about a third improvement, which means only a third improvement because there are 10 that were already there and doing well. If one compares the 10 and the 22 alone it is like a ratio of 2.2, because there are 2.2 more. She was reminded that the test is about the probabilities. She was asked whether there are probabilities that a patient would

have a better outcome after receiving the thrombolytic treatment, and not look at the odds ratio which is something different. She confirmed. He argued that one cannot look at the 280 % better off because there is still 10 patients who did well without treatment and 22 who did well after treatment, so there is a 12 real increase of patients doing better.

[127] She was asked to look at Haacker figure 3 that indicates that there are 41 patients from which there are 22 Rankin 0 and 19 Rankin 1 patients after treatment. He said it means that out of the 100 patients there are 59 who did not do well better than 1. The non treated patients would all have died of something else. But if one looks at the non- treated patients at the placebo there are 10 and there are 19 that equals 29. He said there would have been 72 non treated patients who would have done worse. The next result line says from 100 treated patients 59 had a bad outcome on the results. This should have subtracted the 59 from 72 and that equals 13. So 13 of the bad outcome patients could have been better of had they been treated. There are 72 untreated patients who had a bad outcome and 59 treated patients with a bad outcome. He argued that we must accept that if those treated patients would have had a bad outcome in any event, so 59 of the 72 would have had a bad outcome in any event then 13 of the 72 would have had a better outcome had they been treated which is the percentage they were looking at. She did not agree with what was put to her that the Defendant's actuaries say that the probability of treatment would result in good outcome and must be calculated in that way than which gives one the 18 % probability. She said if one wants to get a probability that a treatment works, one will need to work out the relative risk and that is calculated slightly different. In the percentage of people who in absolute terms, there were 18 % more people worse of. That is what the 18 % says. The 18 % would be better off had they been treated, unless one goes into the file of each patient and do it with 6 000 patients and come up with a different number, because this is what they do, they work with. They reduce to a 100 patients which is the relative frequency of the whole study. She said in her opinion it was wrong that the probability that treatment would have resulted in a good outcome on this 0-90 minutes based on the article she used was 18 %. She explained that 13 out of the 72 is just an indication of the absolute increase in worst outcomes under the placebo. She agreed that the 13 is the percentage of the 72 not of the 22. She said what they need there is a relative risk to give a probability that it would result in a good outcome. The relative risk compares the outcome, the good outcome under the treatment and under the placebo and sort as a ratio towards the whole sample. So when this is done it's a comparison between the placebo and the treatment but not taking into account the full spread of the sample. She said she still does not agree with the 18 %. But what needs to be said is that the 41 % of good outcomes in the treatment group divided by the 29 % of the good outcomes in the placebo group, will give an indication of probability that this treatment is more successful than the placebo effect. It will be 1.4 or 1.3 something, which she said can be interpreted as a 30 % chance or a 40% chance that will work. She said she does not know what the exact number is.

[128] She was informed that the doctors before her testimony have agreed that 33 % of patients treated are better off but not to what extent better off in their consensus report whilst she came with 280%. She was asked as to how does she fit in 280% in the scheme of things. She said her interpretation is completely different, as it cannot be spoken of 280% of patients being better off, as there is nothing like 280% patients. What the 280% and 33 % is used for is completely different. The 2.8 or the 280% is a measure association of a good outcome between the two groups. Whereas the 33 % is for the whole sample and it means if

a patient gets this treatment they have a 33% chance. The 2.8 says the patient has a 2.8 % higher chance. She agreed that it will not elevate the 33% of patients which the doctors have agreed upon to more than 33%. It will stay 33% and in that case they can work out the placebo percentage and that will be much less than 33%, and then compare the two and that is the real difference between the treatment and not treatment and the real terms is not much in absolute terms. In this case in absolute terms if it is 13 out of 100 patients can be better off. 13% in absolute terms. She was informed that the court will have to make a decision that if a 100 patients walked in, how many patients would have benefited from the treatment. Put to her that they got 13 who would be better off because 33 is the ultimate. But with her example if there is 100 patients and they were administered therapy according to this, 41 will be better off, and without therapy 29 so the absolute difference is 13 more. And asked to convert. It was agreed actually the difference between 41 and 29 is 12. So 12 is the absolute difference. She was asked if she can convert the number of patients needed to be treated for one to be better off on the table she was seeing. Which on that was 8 patients needed to be treated and 1 will be better off and this is on this 0-90 minutes. She was asked if 8,9 patients walk in or and you treat 8 of them then there will be one more better off. Her reply was that according to these figures if you have 8 patients walk in 3 of them will be better off because 40 % or 41 % are better off if they get treatment. Compared to not being treated is 29 % if you are not treated that will be better off. The numbers to treat has a slightly different interpretation. On the numbers to treat she said she is not a medical doctor expert and the numbers to treat is not a statistical concept. It is a medical concept and according to that it will be 8 and if 8 patients are treated, it should be interpreted as an extra amount of patients needed to treat. It is not that if someone walks in they form part of that. This is an extra amount you add to get one better.

[129] Asked on the numbers required to treat on the second scale 91 to 180 which can be seen on page 1485 of figure 4, where the absolute difference there is 13%. She said the numbers to treat there will be 1 over 13% so that will be between 7 and 8. And the other one is between 8 and 9. She was asked if it can be written that the numbers needed to treat on the 1st line on the placebo of 150 and treated 161 patients which they can write there numbers needed to treat between 8 and 9. The one below that were the 315 placebo treatments and 302 treatments with thrombolytic treatment in the 91 to 180 minute timeframe there the numbers needed to treat is between 7 and 8. She said she was happy with that based on that table. She confirmed or agreed that when Drs Rosman and Kesler testify that the ballpark figure in their experience is 32 % of the patients are better off, her statistical interference does not change that or the fact that, that is what is reported as the relative risk in many of the literature. It was put to her that Dr Kesler has referred to it as "Overall for every 100 patients treated within the first 3 hours 32 had a better outcome as a result, and 3 had the worst outcome". She said that is not the same as the 33% calculation but the calculation is exactly the same as the 41 in Counsel's table. Saying that if a 100 get treated 32 were better off and your table 41 was better off of 100. The 32 that were better off of 100 treated does not say compared to what.

[130] She said she does not agree with Counsel's figures on the list. Going on D3 she was asked how does she work out on those figures the percentage and what does it mean. It was put to her that there are 41 patients with Alterplase treatment in this 0 – 90 minutes who are better off or made good recovery. There were 59 who did not had a bad recovery. Without treatment there were 29 as supposed to 72. She was asked what was wrong in saying that 13

of the 72 there would have been better off with treatment as supposed to the 72 there would now be 72 minus 13. She responded that it would not be wrong to say that 13 of those would have had a bad outcome, it is because they did not have treatment. It is correct, But if he says that the probability of the treatment working is then based on that figure that is incorrect. When asked what is the better name to give to that percentage of 13 over 72. She said so that 18 % they could word it, as the percentage of patients who had in absolute terms a worse outcome because they did not have treatment. She said in her opinion the 18 % is the percentage of patients in the placebo group who had a worse or a bad recovery rather. In absolute terms then higher than those in the treatment group. 18% of those in the placebo group would have been better off have they been treated.

[131] On the odds ratio she was asked by what does she has to take the 41 which is the good outcome figure, is it to multiply it with 72 which is the high bad outcome figure of non-treated patients and divide that by 29 which is the lower figure of the good outcome placebo. And multiply that with the 59. And then you get the two and it give you an odds ratio of 1 over 73. 1.73. She said that method using the relative frequencies is only correct or accurate if the sample sizes of the treatment group and the placebo are equal. She said they are not in actual fact equal and the fact that they both count of a 100 is just a way to summarise the data. And this is not the raw data and therefore not the raw odds ratio. She said this is a way to summarise the information but in the calculation of the odds ratio is never used. To calculate the odds ratio she said you take the raw frequency. So the 41% out of the whole sample of the treatment group, which was in this case 150 patients and then times that with the 71% times the 161 of the placebo patients. She said they should get close to the 1.96 in table 1 on page 1483 and 1.73 in table 1 the unadjusted odds ratio that is what it should get. The adjusted odds ratio that is what it should get. That is how it is calculated using the raw frequencies. And 1.96 she was asked how did it get to the 281. She said she was not involved in that article. The adjusting is for baseline factors.

Dr Rosman

[132] Dr Rosman, a neurologist in private practice since 1987, who testified on behalf of the Defendants confirmed that he has been closely involved in Neurology for the whole of his professional career some time and on stroke treatment over the years, presently practising from Morningside and often called for the management post emergencies. He indicated in his testimony that the times of Evans' admission on his report were taken from the medical records and as to the time of onset of the symptoms stated as 10h25 to have used the same information as Dr Kesler, also working backwards from the time of admission as a rough estimate, not a medical fact. He says it however seems to have been a little earlier than the time mentioned. According to him the scan that was called for, the CT scan, needed to be done under the circumstances. The blood tests are taken usually as a matter of routine which becomes useful if a patient has very thick blood which cautions against the possibility of a condition called sickle cell anemia, common in West Africa. It could cause an increase in blood clotting and potentially give useful information. Or this might be from the abuse of recreational drugs. It does make sense for the Dr to call for it. Looking at haematology if it is normal. Outcome of pathology report. It was collected on 5 August 2016 at an unknown time.

[133] The blood samples were received by 12h23. The blood thickening could be ascertained only then. He confirmed that he has stated in his report that "The results of the CT scan were

the tissue it becomes swollen. Which is where infarct will be. So there would be an area of damaged tissue that has higher amount of fluid in it and the MRI scan will show rather easy. In the CT scan it might not show at all. Evans' stroke shows evidence of a small area which looks like a non-hemorrhage stroke in the medulla oblongata which is the lower part of the brain and together with this the right vertebral artery cannot be seen and implies that the artery has closed off and that happens to be the same side as the demonstrated stroke. So putting the two together it seems clear that the artery closed off for whatever reason and this caused the damage in that part of the brain. Closing off can also be due to a dissection of the artery which it probably was and he agrees with Kesler's explanation of a dissection being the layers of artery itself dissecting and blood entering into between the layers pushing occluding the artery itself. He explained that before there was tPA which is clot busting. As opposed to clot prevention, they only had blood thinning agents so they could prevent stroke. The idea being that if she starts forming a clot in an artery somewhere, this artery has various branches, that clot will then cause blood in those branches to continue clotting. They felt that if they can prevent that blood clotting they can limit the size of the stroke.

[136] The difficulty they had was to work out clinically how do they know this was happening and that is where the concept of stroke in evolution came from. So what they look at is if the particular artery that they are concerned about is not completely blocked up that they will know from the clinical examination, because they know what bits of the brain the artery goes to, so if any of those bits are not yet involved in the stroke we can assume that there is something to save and the idea being that they could then introduce clot preventing agents. In this particular case they could see from the scan that the area of involvement is the full area of the involved blood vessels, so there was no potential for worsening, in other words this would be called a completed stroke rather than a stroke in evolution. He confirmed that the fact that the symptoms or signs would worsen after the stroke is normal progression of the same stroke that has already been suffered and the results of the same stroke being seen in the patient. Same stroke or some swelling around the stroke, but probably not the progression of the clotting. That would be what is called not evolution (not in evolution). In evolution would be in the middle of the process of the stroke. The onset of the stroke would be the time of the stroke. That is when she experienced the first symptoms.

[137] Sim saw the patient at 11h15 she would have examined her and imperative that CT scan done. The evidence is that there is no Neurologist at the hospital and Le Roux practices from there. If they had diagnosed a stroke and they might still be in the window of opportunity taking into consideration that they don't have a Neurologist or Physician at the bedside of the patient. Whoever is the Specialist would have to be called in. He thinks through hard experience and this case proves the point, he does not trust the examination of Casualty Officers and thinks it is essential that before one embarks on potentially harmful treatment to confirm the diagnosis for oneself. If he was in the hospital at the time and called, he would have dropped everything and ran to the Casualty Department. But not dropped another patient. On the patient's bedside he would then examine the patient to confirm in his own mind that this is indeed what he is dealing with, that the patient is suitable for thrombolysis. He would explain to the patient as much as he or she is able to understand or to relatives what the risks and the benefits could be and once consent is given he would need to find an intensive care unit or somewhere where a bed was available. He would then immediately start with a 10 % of the dosage. Whilst that was running in, he would push the patient to the

Intensive Care. Through a lot of experience, he could probably do a neurological examination in 10 minutes. He would expect a non-neurological person to take up to half an hour to safeguard the decision to ensure that the patient is eligible for the thrombolytic treatment there being 2 or 3 % risk of causing a brain hemorrhage. Many of these may clear uneventfully but many of these he said can cause the death of a Patient. A third of the patient will show some benefit from having had the thrombolytic treatment. They agree on that with Kasler. There are experimental reasons why the various studies will differ. He says there is no such thing as a perfect clinical study. He says from his experience and from literature and from speaking to world experts at conferences this was pretty much the accepted area of benefit.

[138] Ms Evans suffered a posterior stroke, looking at the issue of a treatment of thrombolytic treatment vis a vis her stroke or with Alteplase he explained that posterior strokes are relatively uncommon which means that studying them requires a much larger number of strokes to be seen in the first place. He says there is a difficulty in getting enough to make reliable statistics, largely because the initial research was limited to the carotid arteries, which is the front two arteries. They were reasonable happy that in that situation within certain boundaries they could give treatment. They did not have evidence for the posterior strokes and the anatomy of that area is very different to the carotid. There is very limited space in that part, the lower part of the skull so any swelling there could kill the patient, any hemorrhage clearly could also kill the patient. The blood vessels have got different pathways. So there was a concern from the beginning. Many people still tried it and found that they had a reasonable success rate. This was ultimately better researched in much bigger studies from stroke units where they were training a very large population. He referred to Prof Hacke whose work has been revered to stating that Hacke will tend to drain a wide region of a population who can get to him quickly so the ideal situation to do that sort of research and eventually the first studies started appearing in 2008. Then various studies followed. There was refinement and they ended up where they are now with that being an acceptable area of treatment.

[139] Which would have been the situation in 2011 when Evans suffered a stroke. She would not necessarily been disqualified but having regard to the outcome and general results which the literature shows the treatment would have, it is speculative to a very large extent that about a third of patients would have a chance of a better outcome. How better the outcome is, would be speculative to a large extent. There are very few articles on the subject. Hoping is the best that one can do in the circumstances as per evidence of Kesler. He confirmed that there is one in three possibilities that it would not have deteriorated to the extent that she did if she had received thrombolytic treatment but that extent is non-proven. They do not know how much if she improved what the degree of improvement would have been, that also would depend on what the first measurement was (the status in which she was when she presented) and what your last measurement was. He confirmed that scoring under these circumstances would be difficult, having to go through a list of questions in one's mind to score a patient. Considering that Kesler initially scored her a between 4 and 24 and had a rethink the second day and scored her a 3 and 16. He tried to do that based on the description he had in court. A long list that he ticked up and added up and the highest he got up to is 24 but it could have been a bit lower. He thought maybe to be fair to everybody an 18.

[140] He referred to extracts from the Guidelines for the Management of Adults with Ischemic Stroke published by the American Heart Association. Where the scoring system of the NIHSS stroke scale is set out. He explained that this is looking back without a detailed

examination at that time therefore there is a lot of perhaps presumptions into what is to be looked at. 1A is level of consciousness as known she was not alert. She was not in a coma but was drowsy or octandid. He gave her a 2 for that octandid for that. Octandid means not drowsy but not very responsive, hard to get through. However there were certain responses recorded. It is difficult to score her where there were certain responses recorded that she is denying now. One of them said her face was flaccid. So he gave her a 3. She only said she could not speak properly. So difficult to score on that evidence. There was nothing recorded anywhere. Not looking for eyes that were rolling but an inability to look in a certain way. Then there is visual fields. He found a report of an ophthalmologist who mentioned a small degree of visual field loss when he does a formal measurement. He says there must have been some degree at that stage. Visual affection of the trauma in the brain was possible but not common. For facial movements he heard one of the witnesses saying one side of her face was hanging so he gave her a 3. Then there is a motor function in the arm. If it tends to drift downwards with gravity, that is when the muscles are able to maintain a particular position. He said he was not completely sure, but looking at her now he would imagine that there was no movement so he score her a 4. The same thing with her leg function so he scored her another 4. It is a limb ataxia which is in co-ordination. It would both have been possible to measure that in the affected arm, because it is weak. So he left that out and gave it a 0. He awarded a 2 for sensory loss (numbness or impairment). On language has to do aphasia that is controlled in the left upper part of the brain. That is a long way away from where the stroke was so he said he would not have thought there would have been an aphasia. Articulation she had some difficulty speaking, it was slurred, it was indistinct at some times so he scored that severe. Extinction or inattention he scored her a 0 because she did not complain of a weakness which to him meant inattention and had not scored her although he thought reasonably he could have scored her a 1 or a 2. He agreed it adds up to 18 and confirmed that it is not a material difference from Kesler's score. No longer a 23 as initially put, to be his evidence, to Kelser.

[141] On the Rankin Scale he explained that it was designed for research purposes. So they give umbers so that they can run statistics by definition cause categories. He indicated that there is going to be some uncertainties at the edges, there is going to be some patients where there is some doubt about where they should fit in. In the clinical (scientifically/ setting it probably would not matter. if someone could not walk before and now they can they are better, better than they were. It does not assist much from the statistical point of view. You have to give a number so that they can apply the statistics which the real function of the Rankin scale. It is useful up to a point. There are built in limitations of the scale. In relation to the interpretation of literature meaningfully one has to know what it is. Kesler's opinion was that had Evans been treated she could have been a Rankin 1. The worst case scenario at 2, however if not a complete recovery but an affected recovery it is called a Rankin 2 and can be established clinically. On the question of establishing where she could have been had she been treated, his response was that that is speculative and not predictable. Kesler placed her at a 3 or 4 and he responded that he puts her at a 3 completely agreeing with Kesler that it is a grey area. Since there has been a mention of Evans being unable to dress herself because she cant do buttons, tie her shoelaces and that would push the scale into a higher group. He said the difficulty he has about that is that a lot of people cannot put on cufflinks without help, many women need help to pull up a zip at the back. Some hate buttons and it is difficult to apply this to such a person. So he sees this as a difficult area as unless the researcher who is applying this to that particular bit of research tells us very precisely where it is going to be and how it is going to be, they will be a problem with interpreting this. So if there was a middle

or halfway he would have put it there. He says there has always been variable outcomes that is why the statistics are important. On the chance of patients undergoing the thrombolytic treatment getting a better benefit which comes to very close to round about 30 % which is the baseline improved rate multiply by 2.8 then you get to the benefit which come to very close to round about 30 %, 33 % somewhere there. The one that would have been better without treatment will have to be subtracted.

[142] Under cross examination he confirmed that him and Kesler are very close in their opinions. Revisiting page 1481 ("B5") or ("D5") Given that they accept the reliability of the study. It was put to him that the document's first paragraph says "The aim of this was to confirm the importance of rapid treatment"" and "We aimed to analyse combined data of individual patients to confirm the importance of rapid treatment." He confirmed that was the intention but also said so does many others. Then Counsel read "Onset to start Treatment ("OTT") and pointed out that it is said on research that the average age of the patients involved was 68 years old and the median OTT was 243 minutes, four hours. The aim is to show the detrimental effect if a shorter period of time is used and refer to patients of a different age group not an average of 68. What has been taken into consideration is treatment in a time period of up to five to six hours after Onset. He and Kesler had put the time period to between 0 and 3 hours. He pointed out that time period is divided up into time ranges and what they are talking about is shorter time ranges and excluded those groups in their analysis. He said as far as age is concerned if he had let them say a whole lot of 50 year olds he would expect that the percentage of improvement would probably be very similar although the numbers will be different. So if ones looks at 30 year olds or 60 year olds. He would expect that the percentage would be very similar if one takes age group by age group. It was put to him that as a layperson one would expect that a younger person is more resilient and his body can take more than an old person of 68 years and it would play a factor in what happens if all other factors are equivalent. They both presented the same signs but the one is 68 years old and the other one is 37. No study attempts to draw the age distinction but has got around it by doing it in a random way so that one hopes that the treatment group and the placebo group are made up of similar ways. Where they describe the methodology they would actually give those figures of so many males and females of this age whatever but in a matter analysis which that is they do not give that type of detail. He confirms that because this is a summary of a summary.

[143] On the article "Association of outcomes with early stroke treatment" it was pointed to him that the interpretation in bold reiterate that they say the sooner that rtPA is given to stroke patients the greater the benefit and the statistical analysis says "Of particular interest was whether the odds (Probabilities) of a favourable outcome increased as Onset To start Treatment decreased i.e. whether there is an OTT by treatment interaction". On 1484 on results they reiterate that the median age was 68 years old. Further they are broken down to race classification. Thereafter it says the median baselines NIHSS score was 11 and Median OTT 243 minutes reconfirming the four hours. From the onset and then 1847 patients 67% were treated for longer than three hours after the symptom onset which he and Kesler says they would not do in their practice but only in exceptional circumstances. He referred to where the study reads "Previously the NINDS Stroke Study Investigators reported that the probability of the benefit from intravenous rtPA in the combined data from the "two NINDS trials diminishes as time elapses during the first three hours after onset of the stroke." It was put to him that Evans' results confirm and expand on this finding. The article refer to the 90

to 180 minute of the three hour window and there is no clear line drawn and said to fall within that outcome if you are 91 minutes you fall within the other outcome which is drastically less. The principle being that the longer the time the worse the outcome.

[144] He confirmed that it seems the approach there as well is that in those three hours the longer one takes the worse the probable outcome is going to be. On the statement that, "based on the results of the NINDS trials, approval for use of the drug has been restricted to within a three hour of stroke onset." Rosman agreed that it is the popular view and that is why that NINDS trial limited itself to 3 hrs. It is also stated that "Our results suggest a potential benefit of rtPA could extend beyond 3 hrs, but the potential might come with some risks." A finding that is compatible with results secondary analysis from the other rtPA investigations". It was put to him that this places some doubt on whether outside the 3 hours one can still get beneficial results. Rosman said one can as seen that they show a few per cent improvement, but the improvement possibly goes down, dramatically. He was also referred to the reading. "These data are also consistent with the therapeutic window from stroke symptom onset to start of intravenous RTPA treatment of 240 to 270 minutes." It was put to him that there is data indicating that even 240 to 270 minutes that there is benefit and that has never been in dispute between him and Kesler. He indicated that Kesler was adamant that he will play a couple of minutes past 3 hrs up to 5 – 10 minutes and regard after that to be a waste of time and maybe to can be more detrimental than beneficial. Rosman said he holds a more aggressive view than Kesler, which is more than 3 hrs in very particular circumstances because the older picture suggest that four and a half. it has now been brought down, because of what appears to be a very small percentage benefit. The feeling being that the risk and the benefit are then much the same. On that basis he thinks unless one is experienced then one can stretch the rules in invented commas. According to him it is not a 100 % drawn in conclusion.

[145] He was then referred to still p 1486 to the fourth sentence that says:

"This finding has implications for the timing of thrombolytic therapy, because these patients represent those with the most to gain from treatment since earlier treatment significantly enhances the likelihood of keeping long term disability to a minimum." The effect of the rtPA is greatest in those treated early despite greater stroke severity."

He agreed that the point being made is that the people who present timeously are those with the worst strokes because they realize that, that is something that needs the emergency attention of a doctor. But if the stroke is mild they usually come in the window or outside the window period because they did not think its urgent. The reference is also made to the following:

"Another important finding in this study is the relation between stroke severity and time to presentation. Patient with mere severe stroke arrived earlier in Emergency Unit than those whose conditions was less severe."

It was put to him that a person with a mild symptom because they did not think it was serious they get there after the window period or just shortly before and you get the one with a serious symptoms who is there earlier because everybody is aware that it is serious and what they are dealing with, treated quicker. Rosman responded that because the risk of causing hemorrhage or damage then outweighs the severity of the stroke, up to a point, the more

severe the more they are going to want to treat as there is more to save. He said it also depends and the scales do not tell us that, because if we did the exercise, if he has a patient who has lost his speech and he has got to get informed consent and he says to him well look if they do not do anything then the chances are that they are going to end up with a language problem. If they do something he has got a chance to save it. But also with a 3 % chance of dying. And very often not so much of the older patients but very often they will say well "I do not want to live like this", give it to me. He was of the view that, that is the correct approach and that is in another way of what he was seeing there. He pointed out that however sometimes it is important to treat immediately without consent of the patient or relatives because of the situation, that being emergency treatment. He discussed the possibility of the window of 90 minutes not being met if after diagnosis, time can be consumed by also seeking consent from the relatives of the patient.

[146] Reference was made to a second paragraph of 1486 that "Our study is limited by differences in trial methodologies such as dose of the rt-PA. The total study population was 2775, smaller than that in many acute myocardial infarction trials. However, the magnitude of the differences in outcome is large compared with such trials, especially at early times. Since quicker treatment with rtPA greatly improves the odds of a favourable outcome, particularly within 90 minutes, treatment without delay is paramount." Rosman said the 90 minutes is an artificial cut off. He said if one is 85 or 95 minutes he does not think one suddenly drops his statistics just because one is gone a few minutes away. He nevertheless confirmed that the odds are much worse after 90 minutes. "It was put to him that doctors and other health professionals might take more time to begin treatment when the time limits are longer.' Even when people are taught or they believe they have got six hours they will take their time. Reference is made a statement in the article that "An acute stroke intervention team can increase the speed and quality of assessment given to a stroke patient before treatment and after arrival in an Emergency Department." We urge setting a target of one hour from time of presentation to intravenous treatment for patients with acute ischemic stroke"

[147] It was put to him that on the hour that Evans had when she presented herself at 11h03 if wheeled away within an hour of presentation, she would have had the result indicating to him that the use of thrombolytic therapy is not contra-indicated and within an hour he would have applied that, booster, clock buster) the Bolus. Reference is made to "Our results confirm the strong association between the rapid treatment and favourable outcome." The study reveals what the median age was and the time of treatment was up to 4 hrs and still get results of 2.81 within 90 minutes. He agreed that if one refines what one is working with to lower age, et cetera, one would get a different result which would be more favourable result in the treatment. He confirmed that he arrived at 10h25 as onset by reconstruction counting backwards, just like Kesler.

[148] On B 5 he was referred to 1217 par 3. It was put to him that Kesler confirmed to have looked at the medical records and said he could not criticize the treatment, and it was actually excellent as far as he was concerned. He agreed with the sentiments of Kesler that it was good. It was put to him that if therefore the possibility that because of something that was done later in her rehabilitation she is worse off than she would have been can be excluded, and assume that her rehabilitation was proper and Rosman confirmed. Looking at 3.2 where the onset is recorded as 10h25. He said they both looked at the same medical records and adamant that it was noted somewhere and worked backwards from a certain time. He

confirmed that Evans arrived with pins and needles tingling, at that point she should have been referred for a specialist treatment. He regarded the time when Evans presented herself at the Casualty Department as the "initial admission." On when one involves a specialist he confirmed that he said he does not trust the diagnosis of the Casualty Officers rather a specialist. He said he would wait for a scan even if what he sees is reconcilable with a stroke. The Specialist must then be brought in. The patient is sent for a scan as the expert is going to need that to treat the ailment. When being referred to his opinion that 'Had the Plaintiff been referred to a Specialist treatment, such treatment would most likely have been thrombolysis,' he confirmed that it is the only treatment available. He said whatever the Doctor does is treatment. The administering of a drip, giving an Aspirin to reduce complications (alleviating the *sequelae* of a blockage). This is done over and above Thrombolysis.

[149] On re-examination he confirmed that it is common cause that Evans did not have the thrombolytic treatment, however her condition more favourable then she was because at the time she could not walk at all then, she was confused, had no memory. Whatever statistics might be looked at she still has to be looked at her improvement in her condition without treatment, she would be comparable to the Placebo group and there was certainly an improvement. The problem being on what the difference could have been to which she has not testified or been cross examined about. On p1486 reference to the time frame within what is the target the patient is supposed to be treated. Referring to the Hacke Article B5 that:

"The Doctors and other health care personnel may take more time to treatment if the limits are longer. An acute stroke intervention team can increase the speed quality of assessment given to a stroke patient before treatment and after arrival. We urge setting the target of one hour from time of presentation to intravenous treatment with acute ischemic stroke."

[150] He confirmed that to be the target that was set to aim for, within reason, however other health care personnel besides Doctors were involved in this matter. He was of the opinion that it would make a difference if the Doctor stands at the door receiving patients as they come through the door. However he agreed that in this scenario there is a sifting process at Emergency where the nursing personnel is involved, that would be the triage nurses and the medical staff of the hospital as opposed to the two Doctors and that If there is a delay on their part it cannot be put on the account of the Doctors and that is why they talk about the team.

LEGAL FRAMEWORK

[151] Only causal negligence can give rise to legal responsibility; see *Skosana v Minister of Police* 1977 (1) SA 31 (A) at 35C-D. Causation however will not always follow whenever a wrongful and negligent omission is shown. The Plaintiff has therefore to establish that the Drs' admitted wrongful and negligent breach is causally connected factually to any of Evans' pleaded *sequelae*/damages to give rise to any legal liability. To prove a causal connection between the act of negligence and the harm/*sequelae*, Evans must establish that on a balance of probabilities the negligent conduct/omission caused the event that gave rise to the harm. The test in that regard is as stated in *Minister of Police v Skosana* 1977 (1) SA 31 (A) at 35C-D that "but for the negligent act or omission of the Defendant, the event giving rise to the

harm/*sequelae* in question would not have occurred. According to Brand JA in *ZA v Smith* 2015(4) SA 574 (SCA) para 30): 'The application of the "but-for test" is not based on mathematics, pure science or philosophy. It is a matter of common sense, based on the practical way in which the minds of ordinary people work, against the background of every-day experiences.

[152] The manner of determining factual liability in medical negligence situations (the applicable tests) has developed into a very controversial and complex subject, with some authorities jettisoning the traditional application of the but-for test (applicable test) and advocating for what they allege to be the **Lee approach** or test in cases where the Plaintiff finds it difficult to surmount the but for test, whilst others still argue that no changes were brought by the Lee judgment but the test remains, bar the rigidity that its traditionalism connotes ; see *Mashongwa v Passenger Rail Agency of South Africa*: 2015] ZACC 36; 2016 (3) SA 528 (CC) para 65

'Lee never sought to replace the pre-existing approach to factual causation. It adopted an approach to causation premised on the flexibility that has always been recognised in the traditional approach. It is particularly apt **where the harm ensued is closely connected to an omission of a defendant that carries the duty to prevent the harm**. Regard being had to all the facts, **the question is whether the harm would nevertheless have ensued, even if the omission had not occurred**. However, where the traditional but-for test is adequate to establish a causal link it may not be necessary, as in the present, to resort to the Lee test.'

[153] It was also acknowledged in *Lee v Minister of Correctional Services* [2012] ZACC 30; 2013 (2) SA 144 (CC) para 39 that establishing the element of factual causal liability is complex and can be challenging. What is required is demonstration that 'but for' the doctors' act of negligence, harm would not have occurred (in this instance, a better outcome); see also *Mashongwa v Passenger Rail Agency of South Africa* [2015] ZACC 36; 2016 (3) SA 528 (CC) para 65 as authority). Its acknowledged that where the act of negligence is a positive conduct, the application of the "but for test is relatively straight forward and could be applied with complete logic as generally it entails mental elimination of the negligent act and seeing whether the harm would then have occurred; see *Siman & Co (Pty) Ltd v Barclays National Bank Ltd* 1984 (2) SA 888 (A)

[154] However, where the conduct takes the form of an omission, application of the test is more challenging. In that case the Defendant is obliged to initiate reasonable action, and the question then is "What would have happened if reasonable action has been taken? It was argued that this involves or requires the substitution of a hypothetical course of lawful conduct for the Defendant's unlawful omission and the posing of the question as to whether in such a case the event causing harm to the Plaintiff would have occurred? A positive answer to that question establishes that the unlawful conduct of the Defendant was not the factual cause, which would then be the end of the enquiry, and a negative one establishes that it was a factual cause; See *Siman* at 915B-H.

[155] This is what is also recommended in The Law of South Africa [ibid par 48] **that the elimination process must be applied in the case of a positive act and the substitution process in the case of omission**. It is however not to be regarded as an inflexible rule as confirmed in *Mashongwa*. This flexibility is said to have a long history and never to have been

discarded. As it is not always easy to draw the line between a positive act and an omission, but in any event there are cases involving a positive act where the application of the “but for rule” also requires the hypothetical substitution of a lawful course of conduct. In other words in order to apply the “but for test” one would have to substitute a hypothetical positive course of conduct for the actual positive course of conduct. This was said to be the logical application of the law and not the expression of a new rule or principle; see *Lee* 2012 (1) SACR there being no general formula and the hypothetical scenario need not be proven, but postulated.

[156] However whether an act or omission can be identified as a cause depends on a conclusion drawn from the available facts or evidence and relevant probabilities. Factual causation being simply, a question of fact; see *Rail Commuters Action Group and Others v Transnet Ltd t/a Metrorail and Others* 2005 (2) SA 359 (CC) (2005) (4) BCLR 301; [2004] ZACC 20). Therefore the existence of a connection is dependent on the facts of a particular case. The court must make a finding whether causation has been established on a balance of probabilities on the facts of the case; see *Minister of Correctional Services v Lee* where the test was said to consist of a two stage enquiry (1) What would a reasonable person in the position of the Defendant have done to avoid the occurrence of the harm? That being substituted (2) Whether had that been done, (a proper diagnosis, a postulated cause) would the event that has led to Evans medical outcome been avoided? In converse, if the reasonable conduct is substituted would that have still resulted in the event that has caused Evans harm/sequelae. That being determined in context. Evans biggest gripe is that she was denied an opportunity to be evaluated for thrombolytic therapy which may have resulted in a much more favourable outcome. Had she been properly diagnosed and given an opportunity to be evaluated will that have resulted in a much more favourable outcome

[157] Evans has sought to establish that as in the second enquiry that given her factual circumstances it is more probable than not that she would have had a more favourable outcome of her stroke had Sim and Ndlovu acted timeously and correctly diagnosed her, referred her to a specialist and or applying the applicable treatment for the stroke she suffered, which is what a reasonable man should have done: see *Life Healthcare Group (Pty) Ltd v Dr Suliman* (529/17) [2018] ZASCA 118 (20 September 2018). This is where Evans’ argument resides for a favorable outcome. That she was denied an opportunity to be evaluated for thrombolytic therapy which may have resulted in a much more favourable outcome. Sim and Ndlovu disputes the allegation reliant on the international research literature pertaining to the percentage of cases in which one obtains a more favourable outcome if a correct diagnosis is made timeously and appropriate treatment applied timeously.

[158] Evans has only during her testimony postulated to have, as a result of being misdiagnosed and therefore denied treatment for the stroke, lost the ordinary function of her left upper limb and full use of her lower left limb, cannot run and use a brace to elevate the lower limb and the assistance of a crutch to walk, which she says she could have totally recovered from or had a much more favourable outcome. The said sequelae could have been prevented or minimized by the treatment.

[159] It is common cause and both parties’s expert opinion that a reasonable conduct for Sim and Ndlovu, the Doctors at the Unit, when Evans presented at the Unit with the acute

symptoms at the time, to avoid the alleged *sequelae*, was to timeously and correctly diagnose (examine and advise) her ailment to be a stroke, which would have whereafter entailed a finding if she was a candidate for the stroke treatment (which is determined by the time of onset at presentation and the severity of her stroke), and immediately timeously admit her to hospital and give her the treatment or refer her to a specialist for further management and evaluation for thrombolytic therapy or alternatively transfer her to a facility where she can be treated with thrombolytic agents.

[160] The Experts and the literature they have referred to indicates that the presentation with stroke like sensory “symptoms of numbness and tingling down one side is considered to be acute symptoms that indicate acute stroke, which is a medical emergency, the treatment of which is time dependent therefore vitally important that patients who may be having a stroke are admitted to hospital and taken to an emergency unit as soon as possible. Early presentation at the Emergency Unit after the onset of symptoms has been found by the experts to make a patient a candidate for thrombolytic therapy. According to the Experts Evans had presented herself to the casualty within half an hour of the onset, that is within 30 minutes of having started to experience the neurological symptoms therefore they considered Evans a candidate for treatment with tPA. It is a medicine which they have agreed from research if given within 3 hours of the onset of symptoms has overall, better long term outcome. They had recorded that “Plaintiff presented with the onset of numbness of the left arm and leg on the morning of 5 October 2011 at 10h25.” He was seen by Dr Sim after that who noted to have consulted with her a half an hour after onset. They reported that with the appropriate treatment the chance of her being significantly improved would have been about 33% percent.

[161] On various trials/studies done looking at the onset time of stroke symptoms to time for commencing thrombolytic therapy that is IV (intravenous treatment) to dissolve the clot and restore blood flow have shown that the longer it takes to start administering the drug the less likely the results are going to be favourable. It was so projected that the best results are obtained when the treatment is given early and that is generally held to be within 3 hours. Although both had indicated some acknowledgement that there is still some benefit to be derived after three hours and under four and a half hours, however pointed out that it would be as the law of diminishing returns, not only are the benefits less good, but also the risks become greater.

[162] In his 2013 medico legal report, Kelser had indicated that The South African Guidelines for the use of tPA published in the SAMU in November 2010 stipulate stipulate that treatment commence within 4 and a half hours of the onset of symptoms and that the cerebral hemorrhage be excluded on a CT or MRI scan of the brain, which deal with severity. It has since been recognized by both experts that the accepted protocol is 3 hours as a medicine which if given within 3 hours of the onset of symptoms has overall better long term outcome.

[163] Both experts submit that the doctor who examined her (Sim) may well have suspected a stroke, being the most likely diagnosis in spite of Evans relative young age for these acute symptoms. Also that if Evans arrived at the Hospital at three minutes past eleven, registered and was seen by Sim at 11h10. She would have been well within the window of first 90 minutes or even the 3 hours. According to Kesler there is strong evidence that the closer the

onset of the symptoms to her presentation at the hospital or the clinic is brought, the better the chances of doing something if one acts correctly timeously within three hours.

[164] Kelser had agreed that in respect of Evans, the symptoms on onset would have been the inability to hold herself or to bear weight. The first sign being the sensory symptoms in the region of the upper arm which Evans said it further crept down a bit to her lower limb. Kelser and Rosman had stated the time of the onset in their joint minute and their separate medico-legal reports to be 10h25. Kelser confirmed not to have consulted with either Evans or her witnesses on the time of onset, however dismissed any suggestion of a discrepancy by stating that fighting about whether it was 10h15 or 10h25 is neither here nor there, arguing that it is still within the parameter of the 3 hours window period.

[165] The time of onset is crucial in determining what could have been probable and or reasonable conduct and a factual issue which can only be determined from the proven facts or factual evidence presented to court. Kelser conceded that the time of the onset is different and need to be pinpointed or established by evidence. As a factual issue it could not be left to the opinion of the Experts as elucidated in *Michael & another v Linksfield Park Clinic (Pty) Ltd & another* [2002] 1 All SA 384 (A); 2001 (3) SA 1188 (SCA) paras 36-37, when the court said:

“Judges must be careful not to accept too readily isolated statements by experts, especially when dealing with a field where medical certainty is virtually impossible. Their evidence must be weighed as a whole and it is the exclusive duty of the court to make the final decision on the evaluation of expert opinion.”

[166] in determining onset, the court had to take into account the factual evidence that was led, specifically by Evans, Nadine and Mr Evans, since onset is said to be subjective. Evans' testimony was the only direct evidence available from which it would have been possible to pinpoint the exact time of onset and the severity of the stroke at that time. It was but very difficult to follow as it was inconsistent. Her response to interrogation of her evidence was not very clear and a bit vague. As a result attempting to understand her responses was an exasperating exercise.

[167] According to Evans it was before her 10h30 appointment was about to start, when she suddenly felt some numbness in her left arm, thinking she was having pins and needles. The same numbness was subsequently felt on her left leg. She tried to walk but fell over against the wall. Her left leg could not support her weight (This was indicated by Kelser to be the manifestation of her symptoms). She got up and climbed on the bed. After that she phoned her friend Nadine and told her about the numbness, pins and needles and her legs' failure to support her weight. Whilst she was talking to Nadine she felt her face starting to feel numb as well and she started stuttering, struggling to hold a sentence. It can be safely said that, the symptoms of stroke set in before she phoned Nadine, taking into consideration the explanation by Kesler of the meaning of onset.

[168] Nadine indicated that when she was talking to Evans after she received her call, she had looked at the time and she realized that it was 10h15. According to that version actual onset was as a result earlier than 10h15. Mr Evans also indicated onset to have ben earlier by

testifying to have received Nadine's call informing him of the incident at 10h15 -1017. According to Evans she called Nadine after the sensory feeling of numbness, which is after onset. Nadine then made a call to Mr Evans after her conversation with Evans. Nadine's conversation with Evans must therefore have taken place before 10h15. If the conversation between Evans and Nadine was definitely before 10h15, then the time of onset must have been a couple of minutes way earlier than the time of their conversation.

[169] Evans has under cross examination gave different answers to the questions that sought to address the exact time of onset and considered even the possibility that onset was indeed way earlier than 10h15. Initially Evans replied that it was within 5 minutes that the symptoms became a sign that she could not walk. There was nobody to assist her, the hair saloon lady was busy in the hair salon and she was in another room, the beauty room was unoccupied. She then had testified that it was around about 10h10 - 10h30 whilst waiting for the scheduled appointment when she started experiencing the numbness of her limbs. She then confirmed that she might have said to Dr Roper that it was around 10h00, but indicated that it was around 10h00 and 10h15. She denied that she would have also mentioned to Dr's Corie van Zyl or Campbell the Neurologist who consulted with her and noted in their individual reports that she said around 10h00 that morning she started experiencing numbness on her left hand side and slurred speech. Evans then again alleged that at that time her client whose appointment was at 10h30 had arrived at around 10h15. It was put to her that in her evidence in chief she said her client had not arrived yet when she experienced the weakness and numbness of her left arm and leg, climbed on the bed and phoned Nadine. When it was also indicated that Dr Botha had rather noted onset at 10h15, she claimed that she could not have mentioned a specific time because she did not know exactly what time it was. That is how bewildering was Evans' version.

[170] However, on a balance of probabilities looking at the evidence of all the three witnesses, sequentially, complete onset must have been at 10h00, which is way earlier than 10h15 when Mr Evans got the call or the time before then when Evans phoned Nadine.

[171] The opinion of Kelser and Rosman that onset was 10h25 and that of the other experts's was reliant on hearsay evidence anyway and therefore not of probative value. I do consider what the Experts have said that the difference of a few minutes between onset is insignificant. However it is crucial that it should be as near accurate as it possibly can be, as so much emphasis has been put on the importance of the urgency of the patient's presentation at hospital following onset for the acute management of stroke and a better outcome more possible in the first 90 minutes of the 3 hour window. The time of onset and the nature and/or severity of the stroke being determinative if treatment would be appropriate in terms of benefit or risk.

[172] It is therefore apparent that the estimation of the Experts that Evans indeed presented herself to the casualty for examination by Sim within half an hour of the onset and calculation on that basis was inopportunistically incorrect. Sim and the triage nurses had noted that Evans suffered the numbness 30 minutes prior to her presentation at the Unit whereupon Kesler and Rosman had by calculating backwards concluded that onset was at 10h28. It was confirmed that the time of 11h03 indicated on a sticker on the hospital documents is the time that Plaintiff's husband registered her as a patient. It was not the time that the doctor had her in her hands but when the administrative staff was processing her admission. The triage nurse had indicated that Evans arrived at 11h10, to be attended by her. Her blood pressure

was checked which took only 2 minutes. Kelser said the nurses to some extent must alert the doctor of a serious situation. He agreed that Sim was not at the bedside of the Plaintiff at 11h03 like he might have presented. Sim was rather consulted at 11h15 which he saw as a good thing.

[173] Kesler had subsequently after considering the time scale and having dealt with onset confirmed that they can work on the assumption that onset was at 10h00, although he said for him it was difficult to pinpoint it to the minute. Rosman has also agreed that even though he had followed Kelser in his conclusion about onset, it seems however to have been a little earlier than the 10h25 time mentioned. He agreed that on reviewing the documents he had concluded that it was 10h28 or 10h25 and it seems however not to have been correct, there being an indication that it might have been 10h15 or earlier. He indicated that minutes become more important at the close of onset in order to determine when the 90 minute window actually starts to determine the potential risk or benefit.

[174] At the time of Evans consultation with Sim, only 5 minutes was left before the expiry of the first 90 minutes window of opportunity, which cut it very short for Dr Sim to be able to consult, examine and advise the patient on a possible diagnosis whereupon he would decide on the course of treatment.

[175] Seeing that it was Evans' first involvement with Dr Sim, whom they have agreed she saw at 11h15, it was therefore accurate that Dr Sim saw the patient an hour and 15 minutes into the window period, apparently therefore that it was an hour and 15 minutes after onset. Any or proper diagnosis would have hypothetically occurred only after the first 90 minutes post onset after Sim had examined Evans.

[176] Reasonable conduct also required further verification and understanding of the prior medical history of the patient to determine nature and extent of the severity of her symptoms at presentation as reported and or ascertained from an examination. It was important for the purpose of a proper diagnose. However it proved to be a tiresome experience trying to establish that from the evidence presented. According to Evans she could not speak when they arrived at the Emergency Unit. Mr Evans attended to the administrative stuff whilst she was wheeled off to Emergency. Nadine's testimony was that she left Mr Evans to do the administrative work and to present his medical aid card. Mr Evans on the other hand denied giving the information noted by the hospital administration staff when the hospital file was opened on admission. None of the Plaintiff's witnesses wanted to take ownership of the information given to the staff.

[177] During Evans' cross examination about that information she admitted that she had a headache that morning before the stroke set in but denied that it was severe or that she was prone to headaches. She denied taking any medication that morning before the incident. It was pointed out that on the patient clinical record, the information completed was about the numbness on the left side of her body, feeling of pins and needles and having a headache two weeks prior the incident, coughing for 7 days and also being allergic to penicillin and an asthma sufferer. Evans confirmed that she is allergic to penicillin and an asthma sufferer. She agreed that she took a Panado, Compral and Disprin at 7h30 that morning 12 hours prior admission. She said the Vertigo medication was that of Mr Evans. She confirmed to having a left knee operation when she was 16 years old as noted and to have had the last meal the

previous night at 18h30. She also pointed out that she probably would have had breakfast that morning with a cup of coffee but could not remember. She then turned around and denied suffering from headaches for the past 2 weeks and said she could not remember taking any headache tablets. She maintained that she would not have taken three kinds of tablets at the same time that morning.

[178] It is as a result difficult to conclude from her testimony what was her exact health/medical history prior the stroke and the severity of the stroke when she presented herself at the Unit. Whether or not she had a headache that morning and or any persistent headaches for the past two weeks. However according to Nadine, when she was called by Evans to tell her about her symptoms on the morning of the onset, Evans told her that she was feeling pins and needles in her left arm and leg and also had a headache. It was therefore unclear if she indeed had a headache that morning and took headache tablets or had breakfast. The one person that is likely to have had such personal family information was Mr Evans but he also denied that she supplied the information to the Unit. If incidentally Evans did not give this information to the hospital why would her other witnesses deny doing so, if they did. Nadine said Mr Evans went to sign Evans in with his medical aid card. It is also Mr Evans's testimony that he attended to the pre- admission requirements. He was asked for his medical aid card and to fill in forms and spent about 10 to 15 minutes doing that. Mr Evans however still denied giving any of the personal information in the computer generated or hand written hospital records. He agreed that a copy of his front and back of his Drivers' licence, Discovery medical card and ID document, were part of the documents forming the hospital record, confirmed Evans' date of birth and age that was therein recorded and accepted that the 2 signatures of the guarantor on the document are his. He however denied being the one who provided the information about Evans' acute symptoms that she complains of numbness on the left side of the body that started half an hour ago feeling pins and needles, headache 2/52, coughing and clear phlegm for seven days." He said he was never asked what was wrong with his wife.

[179] Mr Evans' denial persisted even though the same kind of information is in the particulars of claim and was provided to Naidoo, their family doctor being the one who also completed the forms. He could not explain how he could not have been the person who provided the information if it was obviously not Nadene. Such a turn of events was shockingly surprising as it was unnecessary, Sim and Ndlovu had already admitted negligence. Due to the proximity of Mr and Mrs Evans' relationship as husband and wife, Mr Evans could not be sincere. His evidence also could then not be relied upon.

[180] As far as Nadine is concerned, she seems to have been genuine except when she had to deal with the information relating to the time when they had taken Evans to Dr Naidoo. She had testified that it is 5 minutes away from Wilgeheuwel, they left and they were back as quick as they can. When she was asked to explain the time of the second admission which she alleged to have been at 18h00 in the evening which was contrary to the hospital record, she now referred to pick hour traffic forgetting that she said it took them just 5 to 10 minutes to get there.

[181] What however was pointed out during the evidence of Evans' expert Kelser is that the hospital records noted that Evans had told the Doctor that the Medication she was on was

Vertebrate, or was on a Vertigo, which Kelser said can be a sign of brainstem involvement. He confirmed that Librium is an agent given in Vertigo and a drug that is used usually in peripheral Vertigo, which arises in the middlefront from the inner ear rather than the brain. It is a schedule 3 drug which means it can only be obtained by script from a doctor. The presence of Vertigo is an indication of a posterior dissection of the artery being involved but not on its own. It but certainly can be part of a stroke syndrome in the posterior circulation. He said the headache is not as common as one would imagine in ischemic stroke. This was said to be underlying symptoms of things not being well. As in the case of dissection it may be that the dissection began some time before the stroke. In most cases of dissection they do find some sort of history indicating what set it off which might be from a fairly a minor trauma dating back when it was roughly a week, two weeks, three weeks before the event. So a headache under those circumstances, especially posterior headache, neck pain which does not have to be particularly severe, can be mild and nonspecific. But it is not uncommon in dissection to have neck pain and headache. It may well be the first sign then that the patient is no longer well but not the first sign of stroke. So although the dissection has begun the stroke has not. He said he was aware that there is a note that Evans took Disprin, Compomol and Panado at 7h30 and was not surprised that there was some headache as the history had suggested that for some two weeks there was some headaches which Evans seems not to remember the details of, but that would not surprise him given that it is now known that there was dissection that suffered from neck and posterior headaches. That being the mechanism of the eventual stroke. Vertebrae is for asthma and Vertigo is for vertigo and she said she has never had vertigo but her husband had whilst her husband denied being on it.

[182] All the same the indication is that things were not well long before the stroke symptoms set in. There were prior exhibitions of a stroke syndrome and the dissection having begun some time ago. A history the hospital would have benefited from had any treatment been considered. The thrombolytic treatment of patients with acute ischemic stroke related to underlying arterial dissection seem to be also a very rare condition.

Nature of the symptoms /stroke

[183] Both Kesler and Rosman confirmed that the neurological sensory symptoms of numbness and tingling down on one side, that was presented by Evans at admission would have to an examining Doctor with experience made him or her suspect a stroke as these were stroke like sensory. Kesler has further testified that "in spite of Evans' relatively young age, stroke would still be the most likely diagnosis in a patient who presents with these acute symptoms. They have jointly agreed that Evans' early presentation at the Emergency Unit after the onset of symptoms would have made her a candidate for treatment with tPA, a medicine which if given within 3 hours of the onset of symptoms has overall better long term outcome. The diagnosis and initial management of stroke as said by them should be within the knowledge and capability of all doctors who work in an Emergency Unit/Casualty. It is however contrary to the assertion that suspicion of a stroke would have come to an experienced examining Doctor, which would then depend on the level of knowledge. They were of the opinion that stroke, it appears, was not considered by her treating doctors in Casualty. They further point out that an acute stroke being a medical emergency, Evans should have been admitted and afforded that opportunity of being assessed for treatment. They thus both considered Evans' management at her initial visit to have been below

accepted reasonable practice. They consider that with appropriate treatment the chance of her being significantly improved would have been about 33% percent. They submit that Casualty Officers ought to be well aware of the option of thrombolytic agent administration in the acute management of stroke.

[184] They on the other hand agreed that Evans' stroke was a very typical onset of an ordinary ischemic stroke that suffered from an acute stroke. Also that it was not a common stroke. The unusual part about it was that it was a brainstem, a little bit more unusual as it was a dissection, a more unusual pathophysiology of a stroke but only one stroke. It evolved over a matter of minutes or at most probably an hour but it is not A typical. Kelser confirmed that by the time she was seen by the Doctors the stroke has occurred and the fluctuating position thereafter was an effect of the stroke. Getting worse overtime. That is what was supposed to be contained by the treatment. This must also be borne in mind when the Doctors are criticized for their negligence in failing to diagnose Evans' ailment.

[185] Kelser had opined that in general, someone who attends a doctor, whether in the emergency situation or a routine visit wants to come out of the consultation with some kind of diagnosis. He acknowledged that in some medical conditions it is well impossible after a consultation of an hour to come to the correct or accurate diagnosis, but should still at that stage have a working diagnosis, something that will be figured out with time. Admitting that sometimes that can be their highest level of understanding, he said they rather should then go somewhat further, even if it means admitting somebody for further observation/ investigations or for specialist care or referral. Obviously in urgent situations there is much less time and one should come to a much quicker conclusion. However discharging somebody saying they experience numbness is not a diagnosis but a symptom. He also admitted that the Doctors who attended to Evans were Casualty Officers, not specialist and that he would have doubted their diagnosis anyway even if it was there. I therefore doubt that the contention that they should have administered the treatment themselves is realistic. I think too much was expected from them.

[186] The South African Guidelines of S A which they all consulted recommended that cerebral hemorrhage be first excluded on a CT or an MRI scan of the brain. The CT scan preferable as it is fast and readily available at most hospitals or clinics. The CT scan of the brain is done in the early hours, or as soon as possible if someone is suspected of having a stroke primarily to exclude hemorrhage or perhaps some other possible cause for their symptoms. The reason being that if a patient is given Alteplase in the face of brain hemorrhage the condition could become worse, increasing the hemorrhage and a good chance of killing the patient. Justifiably a suspicion (working diagnosis) of a stroke might be there before the scan results are available but authentication of such a diagnosis whereupon a decision would be made on the course of treatment or plan of action to be taken would logically only be possible on receipt of the CT scan results. Therefore the final diagnosis which the examining Doctor or Casualty Officer as Dr Sim was expected to make, was to await receipt of results of the CT scan, which was received only at 12h34.

[187] It is significant that the CT scan result showed no contra-indications. Kelser had argued that still the possibility of a stroke should not have been ruled out. Not even Evans' age should have constricted the possibility of a stroke. According to Kelser the appropriate specialist whom he reckoned will have the expertise in the diagnosis of stroke and be aware of the risks was to be called to assess the patient and make the decision on the treatment. More so in such indeterminate circumstances, it would be logical to involve reasonable

expertise. It appears there was no resident Neurologist at Wilgeheuwel, since she was referred to a specialist physician, Dr Le Roux whom Kelser considers would have been eminently suitable to administer the medication. On the involvement of a specialist, Rosman confirmed that he too does not trust the diagnosis of the Casualty Officers rather than of a specialist. He said he would therefore have waited for a scan even if the signs and information supplied might suggest or be reconcilable with a stroke. It is therefore logical that Sim would have awaited the CT scan results prior to finalizing an opinion on a likely diagnosis and deciding on a plan whether to call the specialist who would as indicated have insisted on seeing the scan results anyway, prior to deciding on the treatment or referring the patient to a neurology specialist hospital.

[188] If practicality is considered, time wise, Sim had commenced the examination of Evans only after the administrative process has taken place. The triage nurse have indicated that the Plaintiff arrived at 11h10, her blood pressure checked in 2 minutes. According to Kelser the nurses to some extent have to alert the doctor of a serious situation. He agreed that Sim was not on the bedside of Evans at 11h03 like he might have presented and that she was actually consulted at 11h15 which Kelser saw as a good thing. Sim's responsibility started from then. There is evidence that Evans had at 11h45, between the time of her examination by Dr Sim and going for the scan vomited, which explanation accounts for the time lapse before the scan was actually done at 12h00. For that reason Kelser's criticism that doing the scan at 12h24 is not indicative of expedient attendance to a possible stroke is not fair. Firstly, the actual time the scan was done was not 12h24 but 12h00 and there were other intercepting complications, that of Evans' twitching and vomiting, that caused some time lapse that had to be accommodated in the window period. Evans came back from the scan at 12h20. Kelser was amenable to reconsidering his stand after being implored to actually take into account the probabilities submitted that chances that Evans would have had a needle in her within the first 90 minutes are non-existent but if possible it could have more probably been at the end of the second half of the 180 minute or beyond the window period. He admitted, though he was of the opinion that it would probably have been in the early part of the second half. On consideration of all the evidence it is obvious that, since the scan results were to be expected after 12h20 or 12h24, there being no resident Neurologist at the Wilgeheuwel Hospital and the availability of Le Roux uncertain, the treatment could only have been considered in the latter part of the second half of the 3 hours or beyond the 3 hour window period.

[189] The time that was left for Dr Sim to obtain results, decide on a plan of action or treatment, that is, check and arrange for the availability of Le Roux, a bed at ICU, or for the transfer to another hospital was after the scan results was 26 minutes before the expiry of the window period. Kelser had indicated that it appears the stroke was not actually considered by Dr Sim, for if it was considered then there would have been some urgency in getting the scan as it would be incumbent on her as the Casualty Officer to, under those circumstances, expedite the scan and for the results to be given as soon as possible. He said the scan could have been done in 15 minutes if the working diagnosis was there, being a potential or that it looks like a stroke. He did not amplify as to why the scan would have taken 15 instead of 20 minutes. He pointed out that it would then have been known that there is no contra indication for using the only Altepose.

[190] However, the evidence led contradicts that view as it was noted that on examining Evans, Dr Sim ordered blood tests (which has been indicated to be important as well) after the scan has been done, blood was taken at 12h23. Evans had confirmed a note recordal of her consultation with Dr Sim that during that time blood was drawn, reflexes checked, an intravenous drip was administered, toxicology screening and an ECG done. Scan ordered and thereafter bloods taken; reported to Dr Sim. Evans confirmed that after all that has been done, she got sick and vomited at about 11h45, that is when Zofran and Ativan as prescribed was administered. It is not recorded when she stopped but according to the notes she confirmed that at 12h00 not at 12h24 as suggested, she went for the CT scan. Kelser's criticism of the time the scan was done was evidently misinformed, since it was soon enough. During the scan, her body could not lay still, her left arm and leg was said to have been twitching or jumping. Kesler had also alluded to Evans being quite restless and understood that they had to give her a mild tranquiliser to calm her down to be able to do the scan. That explains the extra 5 minutes. According to Kesler had the scan been expedited it would have taken 15. Evans confirmed that she came back from the scan at 12h20, 20 minutes later. Up to that point all that has taken place was necessary and I cannot find that there was an unexplainable or unnecessary delay, at least caused by the Drs. Nevertheless the difference of what Kelser regards as expeditious is negligible and therefore insignificant. They thereafter waited for the results. At 12h23 blood tests were taken.

[191] No treatment could be considered prior to the Ct scan results. Kelser reported that the results could have been obtained in 2 to 3 minutes thereafter. They, as noted, were available at 12h35 in 15 minutes and Evans' status reviewed by Sim whilst blood results still awaited. Pending the blood results only 25 minutes seems to have been the available time within which Sim could have sought a specialist succor who would have made a call, first on the diagnosis and then decide on whether or not to administer the treatment, especially as the CT scan was accordingly inconclusive, not ruling out the acute stroke. Sim seems to have instead awaited the blood tests results which in Kelser's view, was conduct indicative that Sim was not looking for a possibility of a stroke as blood tests were done to search for possible infection, so whatever was Sim's suspected diagnose if any was wide of the mark. Nevertheless the application of the treatment would then have depended on how soon Le Roux and a bed at the ICU could be available and the transfer could be arranged, which evidence was not before the court. Kelser acknowledged that time was tight, certainly very tight for Sim and that there were indeed other dynamics to be considered which could have impeded a timeous implementation of the treatment, like, as indicated the availability of a bed and of Le Roux, whose whereabouts at the time was unknown, that being a factual issue dependent on the circumstances. Kesler admitted that what could have happened actually boiled down to speculation. He had also agreed that time was tight even if he went through the emotions of expediting the written results or a verbal response from the radiologist to only take 2-3 minutes, treatment would still have been started if things were perfect, outside the window period, within 15 or 20 minutes, assuming on the 10h00 onset.

[192] Having conceded that time was tight and that certain outcomes were indeterminable therefore he had to speculate, Kelser alluded to a suggestion that Casualty Officers should be capable of doing the treatment. He said if a Casualty Officer was under the supervision of a Specialist Physician, he should have given treatment. Notwithstanding that he was speculating in favour of Evans, as it was put to him, the fact is that Sim was not under the

supervision of a Specialist Physician. Kelser also had affirmed that preferably a Neurologist had to be there to assess the patient's rapid condition himself and first of all make sure about the diagnosis, since this is a special field of Neurologist even though Physicians do treat to a certain limit. For that reason a Casualty Officer would not be adequately knowledgeable/equipped to deal with the situation. Le Roux, the Specialist Physician that was available who admitted Evans for a day had later also failed to recognize the Evans' stroke. He was not definitive with his diagnosis, allegedly because of Evans' age which is regarded as unusual for a stroke. I would not trust that a Casualty Officer would be comfortable to give treatment guided by someone who would have been unsure of Evans' ailment as well. unless if he works to. The reasonable conduct would have been to send Evans to a hospital specialized in the stroke field where he would be treated to a large extent by expert Neurologists. She would have but arrived already outside the 3 hour window period. Therefore any assessment that was hoped for could have only taken place probably within the 4,5 hours window period.

[193] Rosman indicated that the blood tests whose results was still not available when Sims went off duty were usually taken as a matter of routine and useful to check the thickness of the blood and type which is ascertained from a full blood count. The outcome of pathology report becomes useful if a patient has very thick blood which cautions against the possibility of a condition called sickle cell anemia that is common in West Africa. It could cause an increase in blood clotting and potentially give useful information. He said it made sense for Sim to call for it and to look at haematology if it is normal. The blood samples were taken only by 12h23 when Evans came back from the scan. Blood here being the problem whether or not it clots or thins or could cause any hemorrhaging.

[194] A further challenge according to Rosman was that whoever is the Specialist that was to be called in, thinking through his hard experience which is validated by this case, would not have trusted the examination of the Casualty Officers and thought it would have been essential that before embarking on a potentially harmful treatment examine the patient to confirm the diagnosis for himself that indeed the patient is suitable for thrombolysis. He would after that explain to the patient or her relatives as much as she or they are able to understand what the risks and the benefits of treatment could be. Once consent is given he would need to find an intensive care unit or somewhere where a bed was available. He would only then immediately start with a 10 % of the dosage. Whilst that was running in, he would push the patient to the Intensive Care. Through his vast experience, he said he could probably do a neurological examination in 10 minutes and would expect a non- neurological person to take up to half an hour to safeguard the decision to ensure that the patient is eligible for the thrombolytic treatment there being 2 or 3 % risk of causing a brain hemorrhage. Many of these may clear uneventfully but many of them might cause the death of a Patient, thus he emphasized the exercise of caution. If Le Roux was immediately available when Sim got the results, he would have required more than the 26 minutes that was left of the 3 hours to come through to the Unit, confer with the Casualty Officer, do the 30 minutes neurological examination required to safeguard the diagnosis and decision to treat, consult with patient or relatives for the consent before giving Evans the treatment. The treatment would have fallen outside the 3 hour window period. This confirms the argument on behalf of the Doctors that Kelser should have actually taken into account the probabilities submitted that chances

of Evans having a needle in her within 90 minutes were non-existent. Actually in all probability she would have missed the boat.

[195] The question that still arises is as was indicated by both experts that if Sim had on suspicion that Evans had suffered a stroke despite the uncertainty, expedited the results of the CT scan (which also unfortunately came back without definite assurance of whether or not Evans has suffered a stroke), would Evans have bit the 3 hour window. Apparently there would have been another 10 to 12 minutes gained to add to the 25 minutes which Kelser maintained should not have made them throw arms and be despondent that they missed the boat thinking they are not going to catch it in time for the 3 hours. He said whether it is 15 or 20 minutes that is left, one should still treat. That is as far as Sim's reasonable conduct could have possibly achieved, at the very best, a treatment at the last 10 or 5 minutes of the 3 hour window or 15 minutes post the window period. However looking at the half an hour that Le Roux would have required as a non – neurologist to do the examination to assure himself of the diagnosis and of Evans eligibility for the treatment, all that time that might have been gained from expediting the scan results would have been usurped by Le Roux's prepping process. Therefore there was no chance that Sim would have beaten the window period. As indicated that time is brain, the more time goes by, the more brain is lost.

[196] Kesler flipped and confirmed that this is a special field of Neurologist even though Physicians do treat to a certain limit, preferably he as a Neurologist had to be there to assess the patient's condition. Since Le Roux was just a physician and Ms Evans is said to have suffered a posterior stroke, which is relatively uncommon, he undoubtedly would have taken longer to assess if Evans' condition was conducive for the envisaged treatment Evans' stroke was said to have shown evidence of a small area which looks like a non-hemorrhage stroke in the medulla oblongata which is the lower part of the brain and together with this the right vertebral artery cannot be seen and implies that the artery has closed off which seems clear to Rosman that the artery closed off for whatever reason and caused the damage to that part of the brain. Closing off can also be due to a dissection of the artery. Kesler's explanation of a dissection is layers of the artery itself dissecting and blood entering into between the layers pushing and blocking the artery itself. Evans referral at that time to a hospital with the relevant specialist treatment would not have improved her condition to be better than the outcome of the treatment at the Gordon Institute as it would have been made post the window period.

[197] Time was indeed tight for Sim. The availability of Le Roux was uncertain, he was not fused about the availability of a bed in the ICU. If it was speculated that Le Roux was possibly not around he must be given a reasonable time to respond. On all the evidence before me, the probabilities dictate that Evans would have fallen way outside the 3 hours window period. Kelser indicated that the type of stroke suffered by Evans was found out in retrospect that it is called Vertebral Arterial Dissection and would have caused the ischemic occlusion somewhere in the brain and reasonably happy that in that situation within certain boundaries they could give treatment. He said Evans stroke has got no similarities to other cases that seem like stroke but were not. At the same time confirmed that in the incidence of the administration of thrombolytic treatment in stroke there is not very huge figures involved in South Africa even in his own practice it is pretty low 4,5 per year. He said there is more confidence now and done most frequently and much more confidently than it was before, which did not apply to the situation so many years ago in 2011. Also that then he was involved in every single case as a Neurologist, which has now changed, no longer that involved.

Therefore it cannot be concluded that Le Roux would have been comfortable applying the treatment not being a Neurologist in a not so clear situation.

[198] The classification of Evans' stroke was also a problem, with Kelser raising the fact that he would, however say that this was a moderate severe stroke which required urgent therapy. On scoring her on the NHSSI Scoring System scale of 2-40 he said he would regard her stroke to have been more than 4 and less than 22 which is moderate. He indicated that he has though not gone through the exercise and does not understand why her level of consciousness was not always perfect and she was twitching. He would, however say that this was a moderate severe stroke which required urgent therapy. He regarded the severe stroke to be over 24 in terms of the administration of t-PA.

[199] The treating of patients with major deficit of a NIHSS score of more than 20 on presentation by administering the thrombolytic therapy is cautioned by the South African Guidelines for Management of Ischemic Stroke and Transient Ischemic Attacks that deals with the exclusion criteria. Kesler was nevertheless dismissive of the caution saying scoring can be out by a couple of points but he would insist as he always uses 24 as his upper limit but accept that 20 is the threshold of the local guideline. Rosman had put Evans on 23 at the time of her presentation. Kesler reckoned he could not argue with Rosman's finding as he did not consult with Evans at the time. He said his limit in giving thrombolysis treatment still is 24 whereas in the document they speak about 20. He could put Evans between 4 and 24. This is another grey area where advise is against treatment because probabilities of an improved outcome are very doubtful and a better outcome not guaranteed. Whilst Kesler on the other hand is insisting that even under those circumstances treatment should have been given.

[194] Ndlela took over Evans' treatment after having started her shift when Sim went off duty. Since there is no evidence of the handover it is speculated whether or not it was done and if so nobody knows how. At the time blood results were still pending. It would be a fair assumption that Ndlela started her shift at 13h00 as according to the nurses report it was noted that "the availability of the blood tests results was reported to Ndlela at 13h05," after the 3 hour window period. Ndlela proceeded to discharge Evans without proper diagnosis and/or a referral to a hospital with the required neurological expertise. With a discharge note there was a diagnosis that: numbness of the left side of the body. Assuming that Ndlela was told about the twitching and Sim had also indicated that there was a weakness, specifically a power loss of 3/5 although Slim seemed to have doubted her own finding by putting question marks next to it. Her discharge of Evans notwithstanding the twitching and clearly in total disregard of the noted weakness indeed clearly impacts on negligence as was observed by both experts. Even though Rosman is of the opinion that Evans also showed a misappreciation of her own condition as at no stage was it said that Evans complained of a weakness on that left side.

[195] Ndlela took over from Sim and seemingly was not adequately briefed of Evans conditions by Sim. Kelser therefore had some sympathy for her since he reckoned it is the duty of the doctor handing over to prioritise and mention what requires the most attention. He regarded the handover to have seemingly been difficult (as they will always be) for Ndlela, if she has only been told that there was nothing wrong with the patient and just waiting for blood results. He said Ndlela was almost given incorrect information as well as the papers that was generated by Sim which remain and form part of handover and of the current notes. So

Ndlela was supposed to be as informed as Sim was on the paperwork. She however seems to have missed the weakness even though Sim did note that there was a weakness of 3/5 however seemed to have doubted her own finding by putting question marks next to it. With a good handover Sim should have been able to give Ndlela most of the salient details of what was going on. Sim was on the contrary clearly at sea as observed by Rosman. On the other hand Ndlela discharged Evans with no proper diagnose when she clearly had a weakness, which conduct impacts on negligence.

[196] However Ndlela came on duty at the expiration of the 3 hour window period, which both experts accepted. It coincided with the blood test results noted as outstanding which that became available 5 minutes thereafter and were clear. One can therefore understand if perhaps Ndlela was not as thorough as she was supposed to be at that stage because she knew that Evans had already been evaluated by a doctor, and nothing wrong found with her unless the blood results indicate otherwise. It was nonetheless late for her to admit Evans and call for Le Roux to ascertain the diagnosis and consider the thrombolytic treatment, make sure there is a bed at ICU to transfer the patient once the infusion has been started. On the onset of 10h00, the application of the treatment could have only been possible at the end of the 4,5th hour. Both Neurologist have agreed that they would not consider treatment due to the increased risk.

[197] Ndlela might have been negligent in discharging Evans without a proper diagnosis but did not have any influence in Evans' loss of an opportunity of the thrombolytic therapy treatment as at the time it was already outside the 3 hours window period. Kelser had confirmed 3 hours as his own protocol hours and that he could be persuaded to accept 3hrs 10 minutes. However he indicate his policy in general to be that risks are too great after 3 hours, because not only is there a reperfuse factor but also an effectiveness factor that the drug is not going to work as well. He conceded that it would have been outside the window opportunity had Le Roux been obtained. He therefore was not going to be critical of a doctor who does not administer t-PA or Alteplase after 3 hours of onset of stroke. Even if there was a chance from one of the later doctors to fall within three to four and a half hours they both Rosman and Kelser agreed that they would not label that as negligence on the part of the doctor for not referring the patient to thrombolytic therapy. Understandably so, taking into account the extent of the possible risk involved in its application after the 3 hours window of opportunity. That outlook exonerates Ndlela.

[198] Consequently even though it was agreed that the patient's chances are better if they receive therapy and remain greater, the earlier the therapy is received, far greater are the chances of recovery. The research has been stratified into time period so to know that a patient does better if therapy is received within 90 minute than if it is received within 180 minute, et cetera and the fall off then becomes quite rapid after that. The falloff and possible improvement although improvement been described up to four and a half hours, it has been indicated to be considered careless to administer t-PA after that period of time, research having indicated that in the 90 minute period the chances of doing better are about 2.8 times better. More has been said on the research which the experts have also considered on the 4,5 hours protocol which I do not find necessary to interrogate since they have come to a logical conclusion on the limit or protocol of 3 hours.

[199] The necessary process that Evans was supposed to go through before a decision is made whether or not to administer the treatment or to transfer her to a specialist hospital would have usurped the time frame for administering Alteplase, the only known agent used in an attempt to cure or to, combat the effect of stroke. Even if Sim and Ndlela had acted reasonably, properly diagnosing Evans she would have lost on the chance of the thrombolytic therapy treatment. Therefore I cannot find that there was prove of a causal connection between the negligence omissions of Sim and Ndlela's and the failure of Evans' debilitation to abate or recede after the onset of the stroke.

[200] Evans has failed to establish on a balance of probabilities that had Sim correctly diagnosed her stroke, she would have had an opportunity of being assessed for and being treated with the thrombolytic agent and as a result her alleged *sequelae* prevented. Alternatively that but for either of the Doctors' failure to correctly diagnose her timeously and treat her, she would not have suffered that extent of debilitation resultant from the stroke, there being no evidential basis to hold the Sim and Ndlela liable for her *sequelae*.

[201] Under the circumstances, as I could not find that the wrongful and negligent omission by the Defendants is causally connected to the Plaintiff's *sequelae* I make the following order:

1. The Plaintiff's claim is dismissed with costs, inclusive of the costs of senior counsel.



N V KHUMALO J

**JUDGE OF THE HIGH COURT
GAUTENG DIVISION, PRETORIA**

**On behalf of Plaintiff:
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