

The Blood is the Life – A Golden Age in Irish Blood Transfusion 1865 - 1879.

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As a member of the Rotunda Historical Society and in preparation for the Rotunda's 275th anniversary and the birth of our one millionth baby, I stumbled upon a reference to a blood transfusion carried out in 1877 at the Rotunda and used to treat a post-partum haemorrhage. I wondered if this was actually correct as blood groups were only identified at the start of the 20th century and the Rotunda laboratory only opened in 1898. How did they manage a blood transfusion without a laboratory or knowledge of the basic blood groups? Fortunately I was able to find the records of this case which then led me to unearth records of other transfusions that were attempted in Ireland in the latter stages of the 19th century. The records gave very vivid descriptions of the blood transfusion processes, and the contemporaneous medical thinking of the time. It is in equal measures intriguing as it is heartbreaking but the most fascinating aspect was how close some of the doctors were to understanding the science of blood transfusion as we know it today.

There are records of blood transfusions being undertaken as long as records exist - circa 850 BCE, Naaman, Chief Leader of the army of the King of Syria was treated with transfusions to try and cure his leprosy. Other persons known to have undergone transfusion include Pope Innocent VIII in 1492. The Pope appeared to be dying, so they transfused blood from three healthy young men. The transfusions had no effect on the pope but unfortunately all three donors died. In his landmark book, Roussel opens with a paragraph on the history of blood transfusion and says that England 'may with justice claim to be the native land of transfusion, from a scientific point of view. It was a publically demonstrated for the first time at the Royal Society of London, in the May meeting, 1665, by Richard Lower, of Oxford, and Robert Boyle**'. Blood transfusion has always been

controversial and in his introduction to the second meeting of the Proceedings of the Dublin Obstetrical Society in 1872, a Dr Ringland states "*The introduction of the operation of transfusion into the practice of medicine at about the year 1667, was the starting point of one of the most violent controversies that has ever agitated the world of medical science*".

Fig 1: Four Main Eras of Blood Transfusion

Era	Description
1 - pre-19th Century	Early experiments usually using artificial serum or animal blood usually lambs' blood
2 - 19th Century	Human to human blood Transfusions prior to the discovery of blood groups.
3 - 20th Century	Human to human Blood transfusion after the discovery of agglutinins and iso-agglutinins.
4 - 21st Century	Molecular diagnostics, Genome sequencing, artificial blood products etc

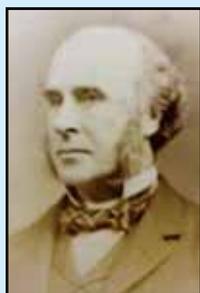
The very first recorded non-blood transfusion in Ireland can be traced back to St John's Cholera Hospital Limerick in 1832 where a Limerick Surgeon, Mr Ringrose Gore, used an artificial serum to try and alleviate the symptoms of cholera in a young soldier. The case describes how a young private in the regiment was suffering from cholera and "*utterly pulseless and in the very act of dying*". They transfused 20oz of the serum and the patient responded very well. Unfortunately after a few hours he relapsed into his previous state and died. A second transfusion was attempted but he died shortly later.

**(Boyle (1627 – 1691) born in Lismore Castle in County Waterford)*

Fig 2: Blood Transfusion in Ireland 1832

Date	Location	Diagnosis	Performed by	Donor	Material transfused	Result
1832	St John's Cholera Hosp Limerick	Cholera	W.R. Gore	NA	Artificial Serum	Some success
1854	Military Barracks Limerick	Cholera	W.R. Gore	NA	Artificial Serum	Immediate recovery after first but no response to second
1856-1857	Dublin	Debilitating disease in horses	J. Farrell	Horse	Whole Blood	Successful
1865	Jervis Street, Hosp	Tetanus	R. M'Donnell	R. M'Donnell	Defibrinated blood	Patient relieved but RIP next day
Feb 1870	Private House Dublin	Post partum haemorrhage - (PPH)	R. M'Donnell	Husband	Defibrinated blood	Successful
Sept 1871	Tenters Lane, Coombe	PPH	R. M'Donnell	Anthony Cassidy - med student	Defibrinated blood	Patient died after 8oz were given (Patient too far gone)
Oct 1871	Private House, Dublin	PPH	R. M'Donnell	Andrew Irwin, resident pupil Rotunda	Defibrinated blood	Successful
1871	Suburbs of Dublin	Miscarriage	R. M'Donnell	Husband	Defibrinated blood	Patient died before transfusion started
Feb 1877	Rotunda	PPH	R. M'Donnell	Mr Gage, pupil	Defibrinated blood	Patient died 2hrs after the transfusion
1877 - June	Rotunda	Accidental haemorrhage	R. M'Donnell	Mr Donaldson, student	Defibrinated blood	Successful
1877 - Sept	Several miles from Dublin	PPH	R. M'Donnell	Husband	Defibrinated blood	Successful
Before 1879	Dublin	No Details	G.H. Kidd	Unknown	Blood	Successful
Before 1879	Leinster Rd, Dublin	Accidental haemorrhage and premature labour	G.H. Kidd	Husband	Warm saline	RIP before blood could be given
Before 1879	Camden St, Dublin	NA	G.H. Kidd	Unknown	Warm saline	Patient RIP
1879 - April	Coombe District Hospital	PPH	G.H. Kidd	Husband	Defibrinated blood	Successful

The first recorded human blood transfusion in Ireland was recorded in Jervis Street Hospital on April 20th, 1865, by the first Irish pioneer in Blood Transfusion Dr Robert M'Donnell. The patient was a fourteen year old girl -Mary Anne Dooly. She had unfortunately severely damaged her right hand in a paper mill accident. Some days later she started to display symptoms of tetanus. The patient's spasms were so severe that she 'was absolutely unable to take nutriment by the mouth, and instantly rejected enemata'. Dr M'Donnell proposed a blood transfusion and the patient's doctors readily agreed to the procedure.



Dr Robert M'Donnell

The first recorded case of a blood transfusion in Ireland was in 1858 and the recipient of the transfusion was a horse. During the autumn of 1856 and spring of 1857 an epidemic occurred among horses in Ireland. It was noted that 'bleeding' the horses appeared to make the symptoms worse so transfusion was proposed by the Veterinary Surgeon to the Lord Lieutenant, James Farrell. He successfully transfused four horses and all made a complete recovery. Interestingly at the time he stated "*for whatever obstacles and objections there may be to its performance in the human subject, there are none whatever to prevent its becoming a*



most valuable agent in veterinary science".

In total there appears to have been fifteen attempted blood transfusions recorded in Ireland between 1865 and 1879. Interestingly the vast majority were carried out in private homes with only a few taking place in hospital. Of the fifteen cases nine were deemed to have been successful.

Dr M'Donnell voluntarily donated 12 ounces of his own blood. The blood was defibrinated by stirring with a glass rod and passing through 'scalded' muslin. It was kept at a warm temperature by keeping the blood in a bowl floating on hot water. It was then transfused to the patient using a rudimentary syringe. Every two to three minutes during the transfusion the patient was asked how she felt and she expressed herself as feeling "*an agreeable sensation, an undefined sensation of warmth pervading her*". An hour after the transfusion her "*sensations of hunger and thirst were quite allayed*". Unfortunately the transfusion had no effect on the spasms and she died on Friday the 21st. Her ability to describe the "*agreeable sensation*" during the transfusion drove Dr M'Donnell on to pioneer the use of Blood Transfusion in Ireland.

It was after the above case that Robert M'Donnell invented an apparatus for injection of defibrinated blood or any other fluid into the veins. It was a simple device made up of a long glass pipette, rubber tubing and a cannula. This is now held in the heritage section of the Royal College of Surgeons in Ireland. The apparatus is currently on public display in Beaumont Hospital. Dr M'Donnell's instrument was forgotten over time and it was a chance finding by Dr J.D.H. Widdess in the 1920's that prompted him to write a review of Dr M'Donnell.

Although Mary Anne Dooly was the first recipient of a blood transfusion in Ireland the first documented case was described by Dr Thomas E Beatty in 1870. Dr Beatty described a "handsome and well made lady" patient of his who was on her 3rd pregnancy and complained of bleeding without pain every night. On the 22nd February at 7 o'clock Dr Beatty was called for and found that "she had been seized with labour an hour before, accompanied with profuse haemorrhage.....a six month old child was expelled, alive and lying in an ocean of blood". The patient was "pale, pulseless, and as cold as marble". He called on his colleague Dr Denham to assist as "it was plain to see that she was in imminent peril". The pulse did not return and they continued to try and resuscitate her. The patient was dying and they could do little else than watch her die unless her "downward course was checked and I saw no other chance for her but transfusion". They summoned Dr Robert M'Donnell. At "6 o'clock her condition further deteriorated and all traces of pulse had long vanished, and death seemed very near at hand". Determined not to let her die he again summoned Mr Colles and Dr M'Donnell who duly arrived at 9 o'clock and it was clear that she had only minutes to live. They proceeded to transfuse her with blood donated by her husband. The blood was prepared in the parlour and carried up to the patient. They located a collapsed vein that resembled a "small flat dead earthworm". Robert M'Donnell using exceptional dexterity was able to open this vein and insert the cannula. The blood was poured into the instrument and air bubbles removed. About 6 or 7 ounces of blood were poured into the system. "The first change I noticed was the improvement in respiration, the long laboured, gasping sighing effort that had been so distressing to witness became more calm". When she awoke some hours later she immediately asked for food and ate a good breakfast. Within a week she was well enough to drive in a carriage and she left town for the country. Later Robert M'Donnell remarked that it was "one of those cases which repay a surgeon for years of anxiety and toil, and which make up for many disappointments".

A very similar case was presented by Dr John Ringland in 1872. The patient was 23 years old and had delivered two babies abroad and on both occasions she had a significant haemorrhage. The delivery went without issue but due to her bleeding history the doctor kept her under close observation. After some time he felt it safe to leave the room but on his return he found that haemorrhage had started and blood poured from her in a "profuse stream". He tried all the usual methods of stopping the bleeding including injection of cold water into the uterus but the bleeding increased. He called on help and it came in the form of a Dr George Johnston and together they injected a solution of perchloride of iron "after which not one drop of blood was lost". Unfortunately it now became manifest to both doctors that "matters were assuming a most alarming aspect, and that a fatal issue was all but impending." Dr Ringland at that point suggested

"in a low voice, so as not to be audible to our patient, the advisability of being prepared for transfusion". They sent for Dr Robert M'Donnell. While they were awaiting his arrival they decided to get the blood ready but that became an issue as there was no one suitable to donate. Dr Ringland suggested getting a medical student from the Rotunda. They were not disappointed, Dr Johnston returned in a short time, accompanied by the volunteer, Mr Andrew Irwin of Sligo. Interestingly in this case "her sanction was sought for, promptly assented to its performance". Might this be the first time patient consent was obtained for a blood transfusion? Prior to the transfusion there was not any "pulsation whatever to be felt at the wrist, although frequently and anxiously sought for; but scarcely had three or four ounces of blood been transfused than, to our great joy, a pulse - scarcely perceptible, 'tis true, but still undoubted - was found". Dr Ringland goes on to state that "transfusion in her case was an imperative necessity, and I conceive that I have fully demonstrated that our patient was snatched from death to life...".

The first recorded Blood Transfusion in the Rotunda Hospital was in 1877. The case involved a thirty year old lady admitted to the Rotunda Hospital on Tuesday 6th February 1877 at 1:30. It was her eighth pregnancy. The patient was "aged looking and obviously anaemic". At 16:00 a healthy baby boy was born. After about half an hour a small but steady stream of blood was noted. Even after injecting cold water into the uterus the bleeding continued. Suddenly the patient's condition deteriorated, her pulse could hardly be felt and she complained of feeling very weak. At 17:45 the Master was summoned and immediately set about injecting a solution of perchloride of iron. The bleeding immediately stopped and no further loss occurred. The patient's condition improved and her pulse returned. She expressed herself as feeling comfortable. Unfortunately the satisfactory state did not last long and she had collapsed a short time later. "Seeing that her life must speedily become extinct, unless the vital powers could be invigorated, I decided on trying transfusion, and sent for Dr R M'Donnell". He came promptly and at about 19:45 the transfusion started using blood from an intern. Dr Atthill later stated that at this point the situation was serious but not without hope. The blood entered the patient's vein freely. Unfortunately, the pulse did not return and the patient, instead of expressing any sense of improvement, became very restless and complained of great distress and of pain in her chest. The whole quantity of blood was transfused in the expectation of the beneficial effects but in this they were disappointed. The restlessness increased, and the breathing became shorter and shallower. She gradually "sank" and died at 20:00, six hours after the birth of her child, two after the transfusion commenced. This is likely to have been the first recorded blood transfusion reaction in Ireland.

Dr Atthill brought up this case at a meeting of the Dublin Obstetrical Society in April 1877. He wanted to know what caused this patient to haemorrhage as all due care was given. He asked if the injection of the styptic was delayed? He was concerned as to what caused the distress witnessed during the transfusion? Importantly he raised the question that not only was the transfusion a failure, but had it actually caused injury? And if so, how could we guard against this happening in similar cases in the future?

In reference to the first issue he elaborated on the patient's history. She had given birth previously to seven children, five of whom were still alive. Shortly before her



The Rotunda circa 1900

admission to hospital her husband knocked down and injured a child while driving a van. He was arrested and committed to gaol, leaving her and her five children deprived of a means of support. He blamed her distressed mental and physical state for the cause of her bleeding. On the second question he advocated the early intervention with perchloride of iron as *"had never had cause to regret using it in cases of post partum haemorrhage"*. In relation to the third and fourth question, he pointed out the fact that he could not explain the cause of the great distress observed during the transfusion. He was absolutely convinced that the transfusion accelerated the patient's death. He went on to say - *"The inference to be drawn from the foregoing facts is clearly this - that transfusion is not a perfectly harmless proceeding"*.

The president of the Society then opened the floor to the members stating that *"This is one of the most important cases that could possibly come before us..."*.

Dr Robert M'Donnell was in attendance and was first to speak and answer the concerns raised by Dr Atthill. He started by acknowledging the fact that *"it does not come upon me for the first time there are doubts as to whether the operation of transfusion may not have been the means of accelerating the patient's death"*. He deals with the third and fourth question directly - it is said that the cause of the distress felt by the patient was the transfusion, and that distress accelerated the fatal issue. Dr M'Donnell could only refer back to the one case where a patient was sufficiently conscious during the procedure to describe it adequately. He referred back to Mary Anne Dooley who expressed that the transfusion was not distressing but was rather agreeable, warm and revivifying feeling. Based on this he felt that the transfusion could not be blamed for the distress and laboured breathing experienced by the patient. *"We need not lay the blame on the transfusion in such a case which we have heard. We have a wretched starving woman, with a number of children starving along with her, her husband*

in gaol, and unable for several days to provide food for his family. I do not think, when we are brought to the bedside of a moribund creature in that condition, that it is necessary for us to seek very far for the cause for the laborious and painful sinking when she came to be in articulo mortis...."

In relation to the infarction of the lung, he vehemently denied that it could have come from the transfusion as he defibrinated and strained the blood prior to transfusion. He felt that after stirring the blood with a glass rod and straining it that it would have been impossible for the clot to have come from the transfusion. He goes on to say that he is absolutely in favour of using defibrinated blood - *"Fibrine has long been supposed to be an all-important nutritive element of the blood. We now know..... from an accumulation of observations, that fibrine is not an important element in the blood plasma, but is rather an excrementitious substance away from the tissues, than a source of nutriment for them"*.

After a lengthy debate Dr M'Donnell closed the meeting by saying - *"I can only say it gives me the greatest pleasure to assist in performing it on the patients of any gentleman here. I have been asked by several of them to go to the Coombe and elsewhere; and whenever they think they have suitable cases, in which the operation can be performed with any reasonable chance of saving the patient, I shall be delighted to lend them my assistance among the poor, at any hour of the day or night"*.

The Society then adjourned.

The resulting discussions amongst society members show that there was some resistance to performing blood transfusions. This resistance appears to have won out because there is no reference or documented transfusion in Ireland between 1879 and 1922 when a paper written by Mr Henry Stokes was published in the Irish Journal of Medical Science in Dec 1921. Why did transfusions stop for this duration? It is unlikely that it became established practice because the clinical report for the Rotunda in 1922 showed only transfused 2 patients all year and it is worth noting that

the first recorded transfusion in the Mater was in 1935. Could it have been due to increased reports of severe reactions in mainland Europe? Would this have led to the complete cessation of transfusions when there were such successful outcomes also? The retirement of Dr M'Donnell in 1888 could have caused a decline in the transfusions but again this is difficult to believe. Dr M'Donnell was noted as an outstanding teacher. One would have assumed that he would have taught his students the process of blood transfusion? Internationally there was a reduction in the use of blood transfusion as saline became more widely available.

Could the Victorian obsession with vampires be a reason that blood transfusion fell out of favour? Bram Stoker's 'Dracula' was published towards the end of 1890's but the notion of vampires was very prevalent in Victorian society. We know that Stoker's father and two brothers practiced medicine in Dublin at this time and would have been aware of Robert M'Donnell. Also the device described in 'Dracula' for transfusing blood to Lucy more than resembles Robert M'Donnell's device. Furthermore Mr William Stoker (Bram's brother) was very close friends with Dr Kidd and was present at his bedside when he died. There were other Irish 'horror' writers around at that time i.e. Joseph Sheridan Le Fanu who wrote 'Carmilla' - a story of a lesbian vampire, which predates Dracula by 26 years. Did the public associate blood transfusion with evil? Another reason for the decline in blood transfusion could be the emergence of the anti-vaccination movement in the UK. The anti-Vaccination League and the Anti-Compulsory Vaccination League were established in 1850's and were hugely successful. This group likened the vampire's fangs to the needle of the physician. They also played on the Victorian cultural anxiety and their belief in strong blood lines.

The Master of the Rotunda in 1877 was Dr Lombe Athill and it is interesting to note that even then he wrote that *'although post partum haemorrhage is of common occurrence, deaths from this cause are now infrequent'*. He goes on to say *"Still deaths from haemorrhage do from time to time occur, and in spite of our boasted knowledge, will, I fear, continue to do so"*. A statement that is as relevant today as it was over 140 years ago. It also shows how practise can change based on belief and flawed experiments. Dr M'Donnell firmly believed that fibrin was an *"excrementitious substance"*, the complete inverse of what we now know to be the case. In 1872 he suggested that patients blood could be re-infused during an operation something we call cell-salvage today. What if they started to employ this then would they have noticed that the patients were not having the same life threatening reactions seen in some autologous transfusions? Those who do not learn from history are doomed to repeat it. There is no doubt that medical historians of the future will hold their heads in their hands and wonder how we were so close understanding the mechanisms of disease yet be so far away.

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