A Brief History of Diabetes

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Why?

- The medical profession know so much about diabetes now, but when did physicians first recognise this debilitating disease?

- I had no idea but wanted to know, so I started digging.

When?

When?

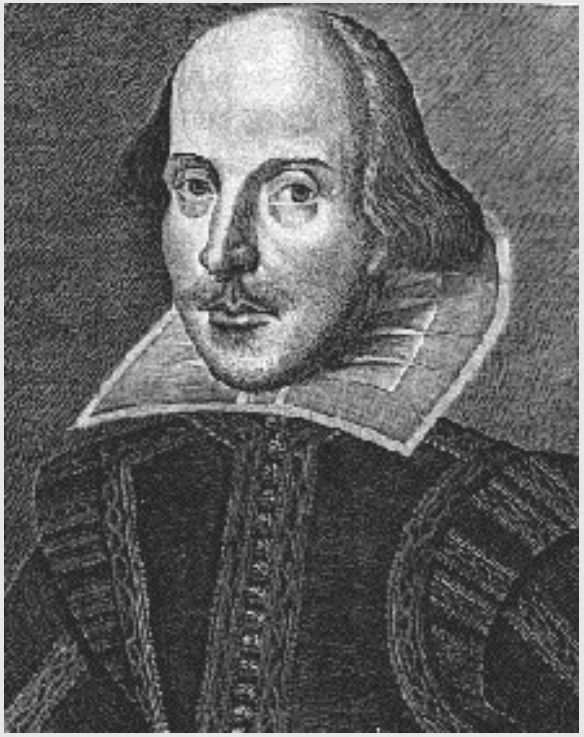
- **100 years ago** – The end of Queen Victoria's reign

When?

- **250 years ago** – The Great fire of London (1666)

When?

- **500 years ago** – The era of William Shakespeare



When?

- **750 years ago** – The signing of the Magna Carta

When?

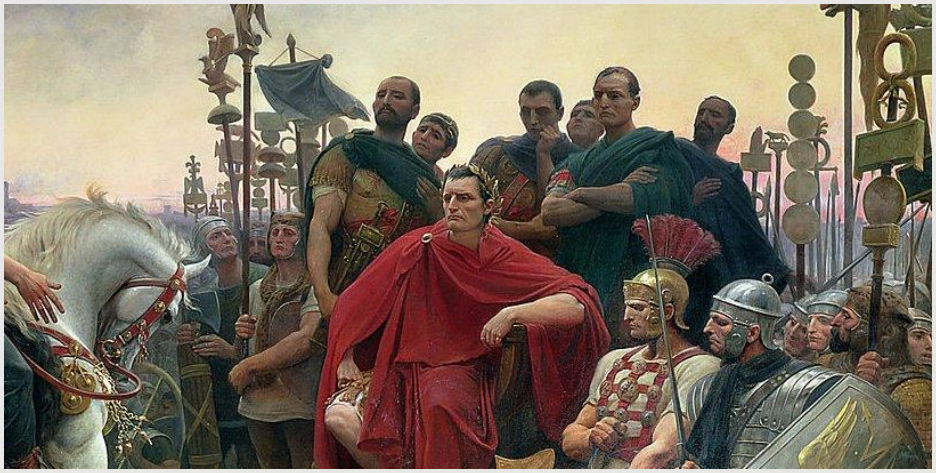
- **1000 years ago** – Battle of Hastings 1066, William the Conqueror becomes King of England.

When?

- **1500 years ago** – The Dark ages (post Roman rule)

When?

- **2000 years ago** – Juleas Caesar led the first Roman army into Kent, for what would be the beginning of the Roman occupation.



When?

- **2500 years ago** – The Iron age

When?

- **3000 years ago** – The Bronze age

About 3,500 years ago!

- 1552 BCE (Before common era) An Egyptian by the name of Hesy-Ra mentions Diabetes like disease for the first time. It is mentioned in the ‘Ebers’ Papyrus, and gave remedies for ‘The passing of too much Urine’.
- Hesy-Ra was the first ‘doctor’ to consider changing a patients diet to help with their condition (Diabetes)
- The modern day description we use for describing what Hesy-Ra saw is ‘Polyuria’

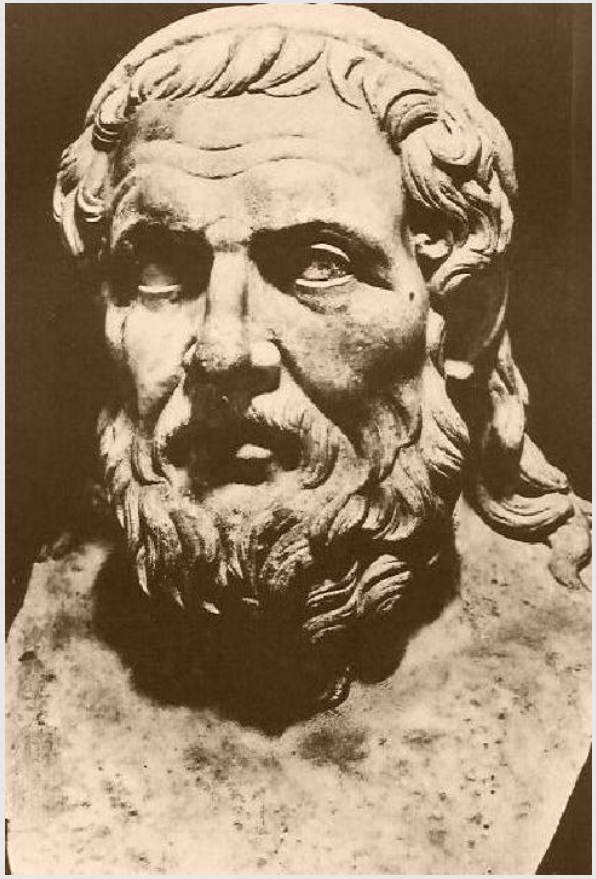
2,250 years ago

- 250 BCE, Diabetes was again described by Arateus, a Roman Medical Philosopher as, "*The Melting down of flesh and limbs into urine.*"

- This first describes the relationship between Diabetes, ischemia, and the subsequent loss of limbs

2,000 years ago

- Apollonius of Memphis, which describes a disease which ”drains patients of more fluid than they can consume”.
- The term ‘Diabetes’ is created, meaning ’to drain through’ or ‘siphon’



1,800 years ago

- Galen of Pergamum, a Greek physician theorises Diabetes as an affliction of the kidneys

1,000 years ago

- A Persian polymath called Avicenna (980-1037) publishes “The Canon of Medicine” in 1025, providing a detailed account on diabetes mellitus. The sweet urine of people with diabetes is described, as is abnormal appetite, diabetic gangrene and sexual dysfunction.

500 years ago

- 16th Century, a swiss physician, Phillipus Aureolus Paracelsus described Diabetes as a “Serious General Disorder”.

- This was the first mention of Diabetes Mellitus being mentioned as a systemic disease, eg, a disease that effects the whole body.

1674

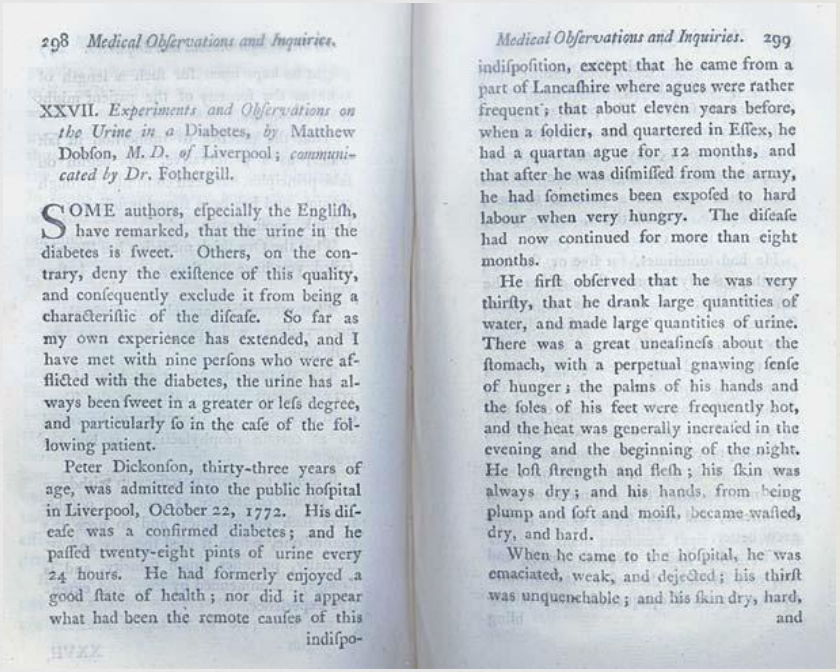
- Professor Thomas Willis of Oxford University, in his book ‘Treatise Pharmaceutice Rationalis’ (Rational Pharmaceutical Treatments), describes the urine of his patients with Diabetes as being “Beautifully Sweet”.

- The method of tasting the urine was the first method for diagnosing patients with the disease.

1776

- An English Physician, Matthew Dobson from Liverpool, discovered that when he evaporated a patients urine with Diabetes, the resulting residue was a granulated substance, that smelt and tasted of sugar.

- This was an extension of the diagnostic process for diabetes, that Professor Thomas Willis first discussed.



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XXVII. *Experiments and Obſervations on the Urine in a* Diabetes, *by* Matthew Dobſon, *M. D. of* Liverpool; *communicated by Dr.* Fothergill.

SOME authors, eſpecially the Engliſh, have remarked, that the urine in the diabetes is ſweet. Others, on the contrary, deny the exiſtence of this quality, and conſequently exclude it from being a characteriſtic of the diſeaſe. So far as my own experience has extended, and I have met with nine perſons who were afflicted with the diabetes, the urine has always been ſweet in a greater or leſs degree, and particularly ſo in the caſe of the following patient.

Peter Dickonſon, thirty-three years of age, was admitted into the public hoſpital in Liverpool, October 22, 1772. His diſeaſe was a confirmed diabetes; and he paſſed twenty-eight pints of urine every 24 hours. He had formerly enjoyed a good ſtate of health; nor did it appear what had been the remote cauſes of this indiſpo-

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indiſpoſition, except that he came from a part of Lancaſhire where agues were rather frequent; that about eleven years before, when a ſoldier, and quartered in Eſſex, he had a quartan ague for 12 months, and that after he was diſmiſſed from the army, he had ſometimes been expoſed to hard labour when very hungry. The diſeaſe had now continued for more than eight months.

He firſt obſerved that he was very thirſty, that he drank large quantities of water, and made large quantities of urine. There was a great uneaſineſs about the ſtomach, with a perpetual gnawing ſenſe of hunger; the palms of his hands and the ſoles of his feet were frequently hot, and the heat was generally increaſed in the evening and the beginning of the night. He loſt ſtrength and fleſh; his ſkin was always dry; and his hands, from being plump and ſoft and moiſt, became waſted, dry, and hard.

When he came to the hoſpital, he was emaciated, weak, and dejected; his thirſt was unquenchable; and his ſkin dry, hard, and

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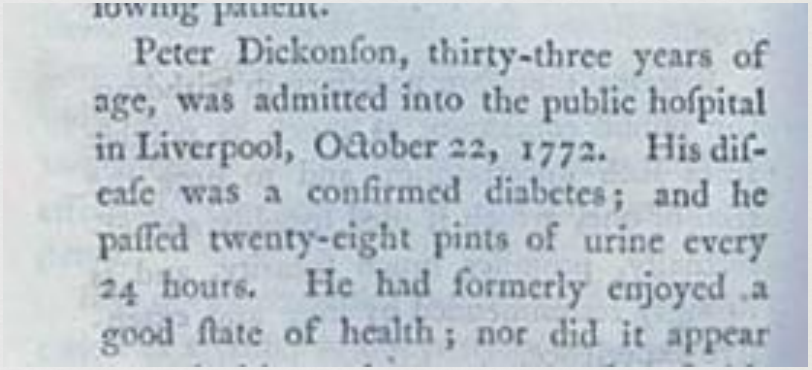
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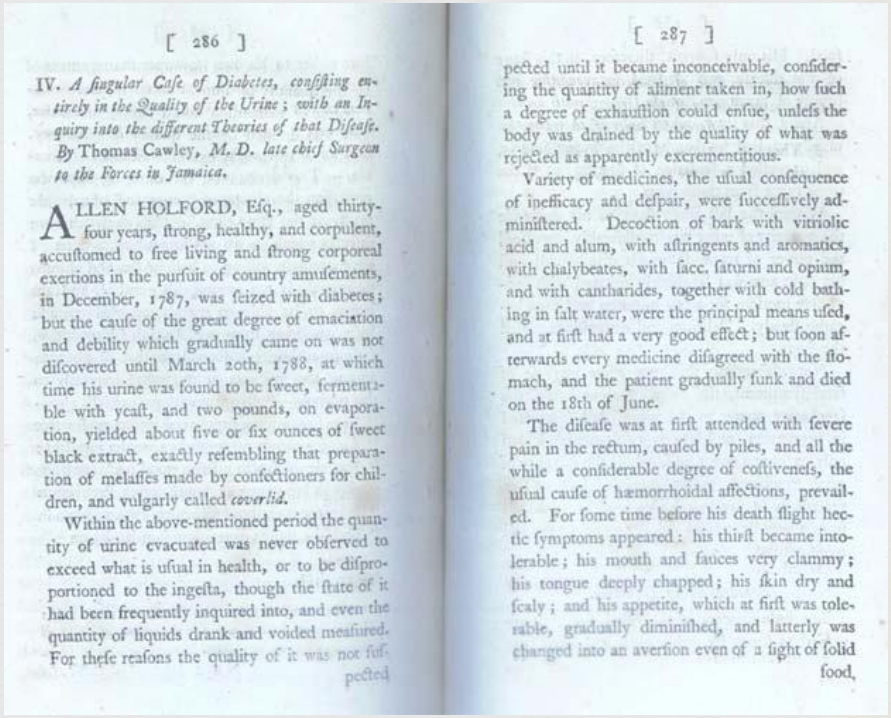
1788

- Thomas Crawley was the first Physician to suggest that Diabetes was linked to the Pancreas.
- He came to this conclusion when he found stones in a pancreas of deceased patient with diabetes.



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IV. *A ſingular Caſe of Diabetes, conſiſting entirely in the Quality of the Urine; with an Inquiry into the different Theories of that Diſeaſe. By* Thomas Cawley, *M. D. late chief Surgeon to the Forces in Jamaica.*

ALLEN HOLFORD, Eſq., aged thirty-four years, ſtrong, healthy, and corpulent, accuſtomed to free living and ſtrong corporeal exertions in the purſuit of country amuſements, in December, 1787, was ſeized with diabetes; but the cauſe of the great degree of emaciation and debility which gradually came on was not diſcovered until March 20th, 1788, at which time his urine was found to be ſweet, fermentable with yeaſt, and two pounds, on evaporation, yielded about five or ſix ounces of ſweet black extract, exactly reſembling that preparation of melaſſes made by confectioners for children, and vulgarly called *coverlid*.

Within the above-mentioned period the quantity of urine evacuated was never obſerved to exceed what is uſual in health, or to be diſproportioned to the ingeſta, though the ſtate of it had been frequently inquired into, and even the quantity of liquids drank and voided meaſured. For theſe reaſons the quality of it was not ſuſpected

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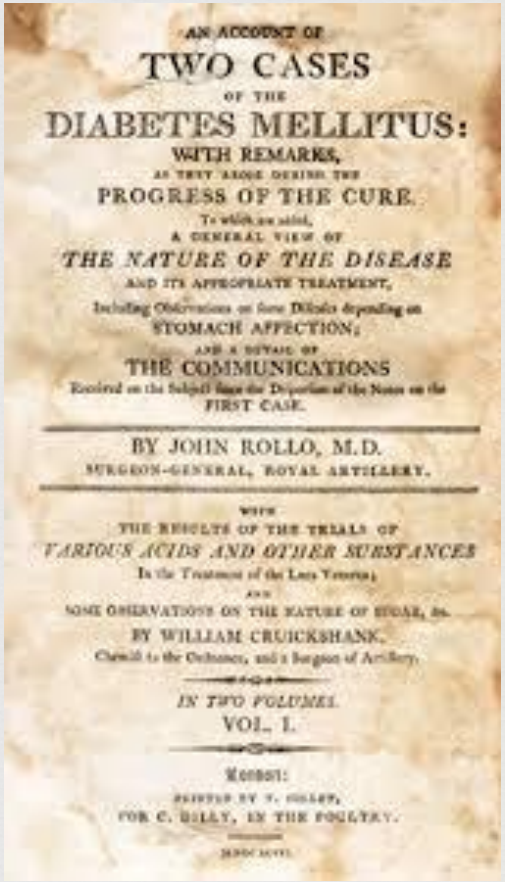
pected until it became inconceivable, conſidering the quantity of aliment taken in, how ſuch a degree of exhauſtion could enſue, unleſs the body was drained by the quality of what was rejected as apparently excrementitious.

Variety of medicines, the uſual conſequence of inefficacy and deſpair, were ſucceſſively adminiſtered. Decoction of bark with vitriolic acid and alum, with aſtringents and aromatics, with chalybeates, with facc. ſaturni and opium, and with cantharides, together with cold bathing in ſalt water, were the principal means uſed, and at firſt had a very good effect; but ſoon afterwards every medicine diſagreed with the ſtomach, and the patient gradually ſunk and died on the 18th of June.

The diſeaſe was at firſt attended with ſevere pain in the rectum, cauſed by piles, and all the while a conſiderable degree of coſtiveneſs, the uſual cauſe of hæmorrhoidal affections, prevailed. For ſome time before his death ſlight hectic ſymptoms appeared: his thirſt became intolerable; his mouth and fauces very clammy; his tongue deeply chapped; his ſkin dry and ſcaly; and his appetite, which at firſt was tolerable, gradually diminiſhed, and latterly was changed into an averſion even of a ſight of ſolid food,

1797

- John Rollo, a Scottish physician extended the theory of Hesy-Ra, of using controlled diet to treat Diabetes.
- He prescribed for his patients an “animal diet”. This consisted of ‘Plain Blood Puddings’ and ‘Fat and Rancid meat’ as these could be easily assimilated by the body.
- Dr Rollo suggested a move to low Carb and protein diets with abstinence from high sugar diets


AN ACCOUNT OF
TWO CASES
OF THE
DIABETES MELLITUS:
WITH REMARKS,
PROGRESS OF THE CURE.
A GENERAL VIEW OF
THE NATURE OF THE DISEASE
AND ITS APPROPRIATE TREATMENT,
STOMACH AFFECTION;
THE COMMUNICATIONS
FIRST CASE.
BY JOHN ROLLO, M.D.
SURGEON-GENERAL, ROYAL ARTILLERY.
THE RESULTS OF THE TRIALS OF
VARIOUS ACIDS AND OTHER SUBSTANCES
BY WILLIAM CRUICKSHANK,
IN TWO VOLUMES.
VOL. I.

1862

- Frederick Pavy was a Physician in London that had the largest cohort of Diabetic patients.
- He concluded that there was a quantatative relationship between the degree of Hyperglycaemia and Glycouria.
- Today this knowledge has helped doctors develop the urine test strips used to diagnose Diabetes

1869

- The Islet cells of the pancreas are discovered by a medical student in Germany.
- Paul Langerhans describes the cells, hence them being called the ‘Islets of Langerhans’, however he was unable to explain their function.
- These are now known as the areas of the Pancreas that contain the Endocrine cells, which secrete hormones directly into the blood.

1893

- Oscar Minkowski induced diabetes in a dog by surgically removing the pancreas of a dog.
- This proved the role of the pancreas, thereby leading to a greater understanding of the disease.

1900

- Eugene Opie made vital advancements in the understanding of Diabetes by linking the failure of the islets of Langerhans, and the ocurrance of diabetes.

1916

- Sir Edward Sharpley-Schafer is his book ‘The Endocrine Organs’, theorised that the the Islets of Langerhans must secrete a substance that governs carbohydrates.
- This was the first modern day indication of the existence of Insulin.

Also in 1916

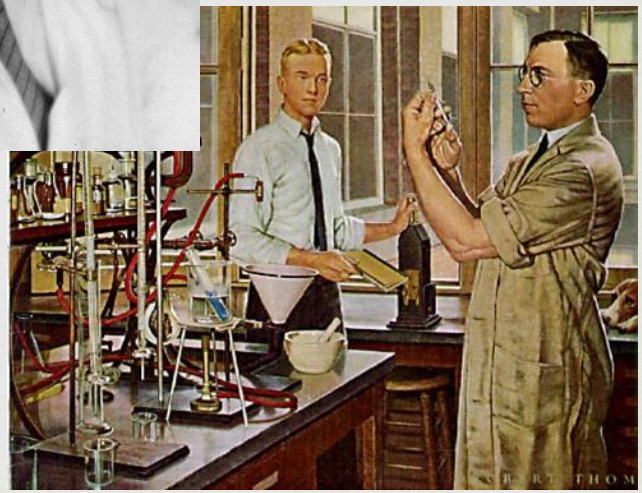
- Doctor Elliott Joslin compiles 1,000 cases of patients with Diabetes Mellitus, in his textbook ‘The Treatment of Diabetes Mellitus.

- His research saw a 20% reduction in deaths in his patients, from the previous year as a result of instigating regular fasting and exercise.

1920

- Frederick Banting experiments with extracts on de-pancreatized dogs to see if it cures their surgically induced Diabetes.

- This is done with the support of Prof MacLeod of the University of Toronto



1921

- Frederick Banting discovers Insulin, and on the 30 July. Dog 410 is the first to receive the extract.
- On the 4th of August the extract is first called ‘Isletin’.
- On the 17th November, Frederick Banton and Charles Best discover that foetal pancreas extract from cattle lowers the blood sugar levels of de-pancreatized dogs. This means that insulin can be produced easily and cheaply.

1921-1922

- In December Dr James Bertram Collip, a biochemist from the University of Alberta, joins Banting and Best to refine the extract even further.
- 1922 - A paper named ‘The Internal Secretion of the Pancreas’ is published 2 months later.
- 1922 - In January a Charity Patient receives the first injection of the excretion ‘Insletin’ to treat his Diabetes. He lived a further 13 years, dying of pneumonia at 27 years.

1922

- On the 3rd May, the word ‘Insulin’ is used for the first time when Professor MacLeod presents the paper, ‘The effects produced on Diabetes by the extracts of the Pancreas’, to the Association of American Physicians annual conference.
- It was hailed as one of the greatest achievements of modern medicine.

1922

- On 30 May, Eli Lilly & Co, a popular pharmaceutical company of the day from Inianapolis, and the University of Toronto strike a deal to mass produce the insulin for patients.

1922

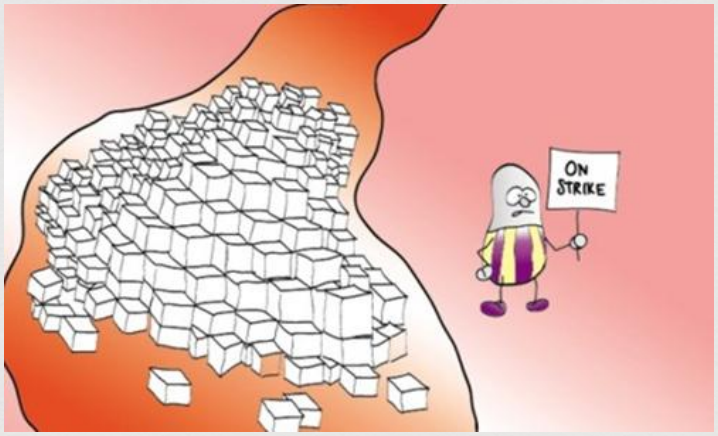
- In August 1922, the Secretary of State, Charles Evans Hughes brings his daughter, Elizabeth Evan Hughes to Toronto to be treated by Banting.
- The results are miraculous and Elizabeth responds immediately to the Insulin treatment.
- She goes on to live a full life, dying in 1981, at the age of 73 years.

1922-1923

- Banting and MacLeod are awarded the Nobel prize in Medicine.
- Banting shares his with Best.
- MacLeod shares his with Collip

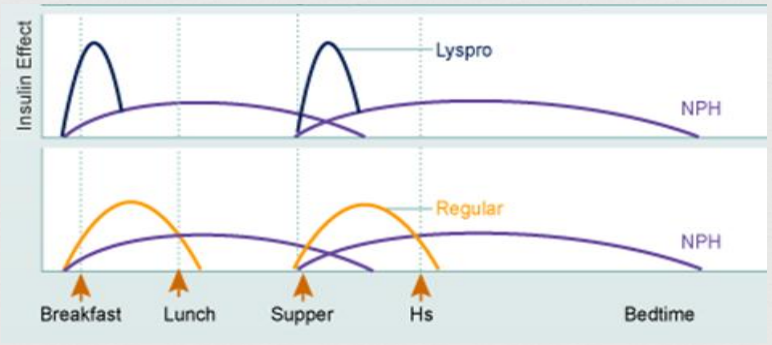
1936

- In his research, Sir Harold Himsworth of University College London is able to categorize patients Diabetes into two types, due to its insensitivity to Insulin, these are:
- Type I - No Insulin produced by the pancreas, leading to increased Glucose in the blood, and subsequently in the urine.
- Type II - Reduced Insulin production or Insulin resistance resulting in slow increase in blood glucose levels.



1936

- Hans Christian Hagedorn, founder of Novo Nordisk, make the discovery that by adding a chemical called ‘Protamine’ to the Insulin, it prolonged the action of Insulin on the patients body.



1944 – 1959 - 1966

- 1944 - The standard syringe is introduced to make diabetic management more uniform.
- 1959 - Researchers identify that diabetes has two types, Type 1 and Type 2.
- 1966 - The first pancreas transplant is performed at the University of Manitoba.

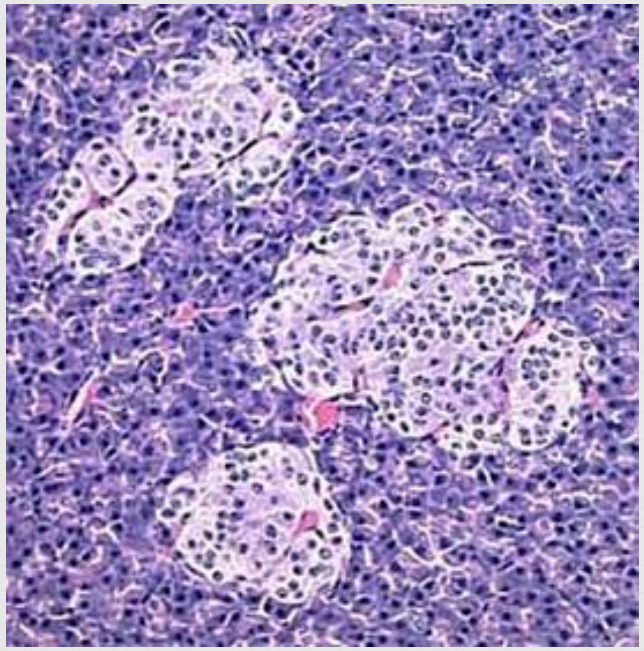
1971 – 1982 - 1998

- 1971 - Anton Hubert Clemens receives the first patent for a portable blood glucose meter called the Ames Reflectance Meter.
- 1982 - Using DNA technology, pharmaceutical firm Eli Lilly develope the first Biosynthetic Insulin, which is identical to human insulin.
- 1998 - The UK study UKPDS scientifically links the control of Glucose levels and blood pressure to control Type 2, and possibly prevent it.

1999

- Scientists conduct the first successful islet transplant at the University of Alberta Hospital. The surgical procedure becomes known as The Edmonton Protocol.

- The United Nations recognizes diabetes as a global threat and designates World Diabetes Day, November 14 – in honour of Frederick Banting's birthday – as a UN Day to be observed every year starting in 2007.



2013

- The University of Cambridge trial a synthetic pancreas that combines both a glucose meter and an insulin pump
- This leads to the development of the ‘Bionic pancreas’

Thank you for Listening