The discovery of insulin, the first step on a journey of innovations

Prof. Konstantinos Makrilakis, IDF Europe Board Member
The option preferred by “experts” of the pharaoh of Egypt 3,500 years ago was a mixture of “water from the bird pond,” elderberry, fibers from the asit plant, milk, beer, cucumber flower, and green dates.
Diabetes is a dreadful affliction, not very frequent among men, being a melting down of the flesh and limbs into urine. The patients never stop making water and the flow is incessant, like the opening of aqueducts. Life is short, unpleasant and painful, thirst unquenchable, drinking excessive, and disproportionate to the large quantity of urine, for yet more urine is passed. One cannot stop them either from drinking or making water. If for a while they abstain from drinking, their mouths become parched and their bodies dry; the viscera seem scorched up, the patients are affected by nausea, restlessness and a burning thirst, and within a short time, they expire.
Beiträge zur mikroskopischen Anatomie der Bauchspeicheldrüse.

Charles Best

Frederick Banting

Marjorie

1921
The discovery of insulin (1921)

Sir Frederick Banting
14/11/1891-21/02/1941

Charles Best
1899-1978

James Collip
1892-1965

John Macleod
1876-1935
Leonard Thompson’s Medical File
Toronto General Hospital, Dec 1921 / Jan 1922

NAME: Leonard Thompson
No.

Provisional Diagnosis:
Diabetes Mellitus -

Dec 31st - Feeling well since admission. Drinking fluids freely.


Jan 14th - 15 cc McLeod’s serum. 7 1/2 cc into each buttock.

Jan 15th - Area of induration circular. 7 1/2 cm in diameter. Over left buttock - center raised, softened.

Area of induration - circular - 7 1/2 cm in diameter. Over left buttock - center raised, softened.

15 cc McLeod’s serum. 7 1/2 cc into each buttock.

FEELING WELL SINCE ADMISSION - DRINKING FLUIDS FREELY.

WEIGHT 65 LBS. APPEARED WELL. FEELING WELL. DIABETIC ACID STILL PERSISTS AT TIMES.

31.161
November is National Diabetes Month

Canadian Nobel Prize Recipient
Dr. Frederick Banting, discoverer of insulin, sold the rights to the University of Toronto for $1 so that it was available to everyone!
100 years of discoveries and innovations to improve the lives of people with diabetes

Timeline of insulin development
with approximate historical dates

- Early insulin concentrations: U-5, U-10, U-20, U-40, U-80 (1922-1925)
- Insulin discovered: 1921-22
- Intermediate-acting NPH: 1950
- Semi-lente, lente, and ultralente insulin: 1954
- rDNA human regular U-100 insulin: 1982
- Semisynthetic human U-100 insulin: 1981
- Long-acting basal analog insulin U-100: 2000
- Rapid-acting analog U-100: 1996
- Biosimilar long-acting U-100 analog: 2016
- Biosimilar rapid-acting U-100 analog: 2018

- Longer-acting protamine zinc insulin: 1936
- Globin, surfen, histone insulins: 1930s
- Beef regular U-500 insulin: 1952
- U-100 insulins: 1973
- Des-phe insulin: 1970
- Chromatographically purified insulins: 1978
- Human regular U-500 insulin: 1997

Legend:
- Animal insulin
- Human insulin
- Rapid-acting analogs
- Long-acting analogs
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**DRUG DEVELOPMENT IN DIABETES**

- **1959** biguanide (metformin)
- **1956** sulfonylureas (tolbutamide)
- **1995** AGI (acarbose)
- **1996** thiazolidinediones (troglitazone)
- **1997** meglitinides (repaglinide)
- **2005** amylin agonist (pramlinitide)
  - GLP-1 agonist (exenatide)
- **2006** DPP-4 inhibitor (sitagliptin)
- **2008** colesvelam
- **2009** Bromocriptine
- **2013** SGLT2 inhibitor (canagliflozin)
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INSULIN DELIVERY DEVICES - SYRINGES AND PENS
100 years of discoveries and innovations to improve the lives of people with diabetes

INSULIN DELIVERY DEVICES - PUMPS
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BLOOD GLUCOSE MONITORING TESTS AND DEVICES
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INSULIN DELIVERY DEVICES - SENSOR AUGMENTED PUMPS
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ARTIFICIAL PANCREAS AND THE DIY-APS MOVEMENT

#WeAreNotWaiting
100 years of discoveries and innovations to improve the lives of people with diabetes

DIABETES EDUCATION, SELF-MANAGEMENT AND PATIENT EMPOWERMENT
We have come a long way in 100 years
Hopefully, we will not need another 100 years for the ultimate
prevention and/or definitive treatment of Diabetes

International Diabetes Federation
Europe