Diabetes
As a Disease
of Technology

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What Stories We Choose to Tell about Diabetes ...
Broad Thesis

The stories we tell
shape the questions we pose
and the answers we create
Specific Thesis

Diabetes is a Disease

Profoundly Shaped

By Technology
Technology is the usage and knowledge of tools, techniques, crafts, systems or methods of organization.

(Wikipedia, accessed 24 August 2010)
Technology Ethos

- Enthusiastic regard of technology as a solution to our problems
- Framing bias: constricted view of what matters
- Examples of over-enthusiasm abound
- Yet, technology can be marvelous
- How, then, do we assess ‘miracles’?
- Diabetes as a paradigmatic case
Two Quotations

- The best treatment for diabetes is to “eat as little as possible.”
- “The remedy for diabetes is not in the drugstore but in the kitchen.”
Story 1

- Unambiguous Progress
Though Technology -
Wonderful Technology: Insulin’s Discovery & Development, 1921 - 1922

Frederick Banting
JJR MacLeod
Charlie Best
JB Collip
Discovery & Development of Insulin

11 January 1922

Toronto General Hospital

Insulin first used in a human, Leonard Thompson, then 12 years old

Only a modest reduction in blood glucose
Discovery & Development of Insulin

- Reliable industrial supply by late 1922
- Nobel Prize in 1923
Stunning photographs …

Billy Leroy, before the onset of diabetes
Joslin Clinic Staff, circa 1950
Survival After Onset of Diabetes: JDC Pre & Post Insulin Cohorts
Story II

- Type 2 Diabetes as a Genetic Disease -
Genome Wide Association Studies

- Type 2 Diabetes is associated with TCF7L2, FTO, and other genes
- Risk may be due to altered energy metabolism, insulin resistance, insulin secretion
- Much media coverage of these associations
- Known genetic associations still explain only a small portion of why people develop diabetes
Story III

- Disease Change with Great yet Ironic Consequences -
2 Mechanisms

Transmutation
Physical Disease Change

Transformation
Illness Experience Change
2. Disease Transmutation: How Do Diseases Change?

<table>
<thead>
<tr>
<th>Patterns</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eradicated or Diminished</td>
<td>Smallpox, Typhoid, Measles</td>
</tr>
<tr>
<td>Substituted for Infections</td>
<td>CVD, cancer</td>
</tr>
<tr>
<td>Relocated or Exported</td>
<td>Cholera, tobacco-related illness</td>
</tr>
<tr>
<td>Emerged De Novo</td>
<td>HIV, SARS</td>
</tr>
<tr>
<td>Re-emerged</td>
<td>TB, gonorrhea</td>
</tr>
<tr>
<td>Transmuted</td>
<td>...</td>
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</tbody>
</table>
Transmuted Diseases: Examples

Survivors with long-term sequelae

• Childhood cancers, prematurity, transplantation

Dependent upon intensive regimens

• Cystic fibrosis, HIV-related illnesses

Dependent upon machines

• Chronic renal dialysis, ventilators

Dependent upon medications

• Asthma, hemophilia, arrhythmias, diabetes ...
‘Natural’ Disease Course

Diagram:

1. Onset of Disease's "Natural History"
2. Natural Progression of the Disease
3. Natural Death Due to the Disease
Transmuted Disease Course

- Onset of Disease's "Natural History"
- Human Intervention
  - Diet Therapies
  - Insulin Therapies
    - Antibiotics
    - Antihypertensive Therapies
Cycles of Disease Transmutation

1. **Advent of New Interventions**
2. **Certain Problems Averted**
3. **Substituted Sequelae Present New Problems**
4. **Attempt to Control Sequelae**
Priscilla White, MD (1900-1989)

- Children with diabetes, some of whom are female & who become
- Young women who
- Sometimes become pregnant &
- Have babies
Transformation of Illness

Onset of Disease's "Natural History" → Human Intervention → Diet Therapies → Insulin Therapies → Antibiotics Antihypertensive Therapies
3 Themes

Getting the Point  
*Self-care work*

The Want of Control  
*Alluring, elusive*

Regulating Responsibility  
*Praise and blame*
Transformation of Diabetic Illness

- Less stigma
- Summer camps and sports
- Not advised against marriage or child bearing
- Less employment discriminated
- Health insurance made care more affordable
- Struggles still with
  - Managing daily work
  - Striving for control
  - Apportioning responsibility
Elliott P. Joslin, MD (1869-1962)

- Master clinician
- Pioneered diabetes care
  - Diet and insulin therapy
  - “Manuals” for patients
  - Standardized records
  - Special visiting nurses
- Public health visionary
  - Diabetes screening
- Blended medicine & moralism
  - *The Want of Control*
Life Span Medal
Life Span Medal

FOR PROLONGING LIFE'S SPAN AFTER THE ONSET OF DIABETES A SCIENTIFIC AND MORAL VICTORY

GIVEN BY THE NEW ENGLAND DEACONESSES HOSPITAL BOSTON
Injecting Insulin
The First Jab

7 a.m., Sat., Sep. 23
The first "JAB"
Cheerio's

Here goes nothing... WOW!?
7 AM and all O.K.
Giving the S.O.S. at 7 AM
I don’t want this to happen

• Nearly 90 years after insulin’s discovery, diabetes continues to put people at risk of
  • Blindness
  • Amputations
  • Kidney failure
  • Heart attacks
Story IV

- Diabetes as a Disease Created & Shaped by Technology -
Diabetes (Type 2) is a ...  

... crisis

UN Resolution (2006): “Diabetes is a global pandemic”, “a silent killer that kills one person every 10 seconds”
Diabetes (Type 2) is the ... Focus of Public Awareness Campaign: World Diabetes Day November 14th
Diabetes (Type 2) is a...

“A disease of civilization”

- Apollinaire Bouchardat (1806 - 1886)
- 1871 siege of Paris - food scarce - patients with diabetes faired better
- “Eat as little as possible” – *mangez le moins possible*
Diabetes as a Disease of Civilization
The Impact of Culture Change on Indigenous Peoples

Jennie R. Joe
Robert S. Young
(Editors)
2 Quotations

• The best treatment for diabetes is to “eat as little as possible.”
  Apollinaire Bouchardat (1806-1886)

• “The remedy for diabetes is not in the drugstore but in the kitchen.”
  Arnoldo Cantani (1837-1893)
Diabetes (Type 2) is ...

An epidemic

• ... due to metabolic aberration
• ... due to human energy imbalance
• ... due to technology
Diabetes (Type 2) is ...
Diabetes (Type 2) is ...
Technology Dimensions

- Implementation Scale (Individual to Populations)
- Hedonic Scale (Unpleasant to Pleasant)
- Distance Scale (Intimate to Vast)

Distance = Physical, Historical, or Economic
Technology Dimensions
Technology Dimensions

[Diagram showing axes labeled 'Populations' and 'Individual', with points marked 'Screening Programs', 'Unpleasant', 'Intimate', 'Vast', 'Food Production', and 'Transportation Infrastructure']
Types of Technologies

1. Small-Intimate-Pleasant/Unpleasant
   - Applied at n = 1 level
   - Deployed in personal space
   - Adherence

2. Large-Vast-Pleasant/Benign
   - Applied at population level
   - Deployed at far remove from person
   - Acquiescence
Let's put our thoughts in order
... versus a different sort of order ...
... and another sort of order ...
... versus yet a different sort of order
Conclusions
There is not only an artistic style, there is also a style of thinking.

Owsei Temkin

“Historiography of ideas in medicine”
A question of leverage

- “Give me a place to stand, and I shall move the world.”
  Archimedes
  287 - 212 BCE

- Where should we stand to do the work of improving health?
1. What story -- or stories -- should we tell about diabetes?

   *If diabetes is a disease of technology ...*

2. Is more technology the answer to technology?

3. What products, programs, and policies are needed to compete with small-scale pleasant or large-scale pleasant/benign technologies that cause energy imbalance?
The stories we tell
shape the questions we pose
and the answers we create
Thank you ...

- ... for your time and attention

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