About Me

• 25 years living in San Diego
• CSUSM Alumni 2016
• Graduate Student 2019
• Global Health Emphasis – I.P.V.
• Over 3 years work experience at Pharmaceutical Companies
• Love to Cook, Travel, and go to the beach

This research was supported by grant T15LM011271
Outline

- Causes
- Prevention
- Diagnosis
- Types of Diabetes
- Management
- Society and Culture
- “Never” Outcomes

This research was supported by grant T15LM011271
Causes

Risk Factors

- Obesity
- Family History
- Inactivity
- Diet

https://www.afro.who.int/health-topics/diabetes
Total Patients Diagnosed with Diabetes 2010–2019

ALL UCSD DIABETIC PATIENTS SINCE 2010 (RACE)

- White: 48%
- Black/African American: 6%
- Asian: 11%
- Native Hawaiian: 1%
- Other race or mixed: 25%
- American Indian: 1%
- Unknown: 3%

None of the above: 3%

UCSD DIABETIC PATIENTS SINCE 2010 (ETHNICITY)

- Hispanic: 33%
- Non-Hispanic: 62%
- Unknown: 5%

This research was supported by grant T15LM011271
Race Detail and Level 2 Ethnic Groups Diagnosed with Diabetes

DIABETES POPULATION: % BY RACE

AMERICAN INDIAN OR ALASKA NATIVE 15% 10
ASIAN 13.2% 86
BLACK OR AFRICAN AMERICAN 10.4% 68
NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER 11% 7
OTHER RACE OR MIXED RACE 19.3% 126
UNKNOWN (PATIENT CANNOT OR REFUSES TO DECLARE RACE) 1.2% 8
WHITE 53.3% 348

UCSD HIGH RISK ETHNICITY VOLUME

BLACK 46
AFRICAN 27
AFRICAN AMERICAN 139
ARAB 7
MIDDLE EASTERN 65
LATIN AMERICAN 9
MEXICAN 185
MEXICAN AMERICAN 134

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**Prevention**

- **1.** Avoid development of disease & remove risk factors
- **2.** Early detection of treatment & prevention
- **3.** Reduce complications

- **Physical Activity** is an important component of type II diabetes prevention initiatives (Boyer, 2017).

- **Screening** for HLA to identify those with high risk genes may best allow for provision of primary prevention efforts (Beauchamp, 2015).

- Primary prevention via **dietary intake** (Beauchamp, 2015).
Diagnosis

An estimated one-third of US adults aged 20 years or older have prediabetes...

but only about 11% are aware they have prediabetes.

- Hypertension identification and control
- Hyperlipidemia

Pre-Diabetes

All Diabetes

- Hypertension identification and control
- Hyperlipidemia
- Eye exams
- Monofilament foot exam

Complicated Diabetes with Poor Control, Comorbidity or complications

- HbA1c > 9
- High blood sugar – high blood pressure
- Cardiovascular events – stroke, heart attack
- Retinopathy
- Chronic Kidney disease
- Foot callous & amputation
Among adults aged 20-79 worldwide 8.8% were estimated to have diabetes in 2015, and the prevalence of diabetes is estimated to increase to 1 in 10 adults by 2040 (Sun, 2017).
Evidence continues to accumulate that type I diabetes is a heterogeneous disorder with respect to its immunogenetics and pathology. (Ziegler, 2016).
Diabetes has contributed to substantial increases in total economic costs in the US from 174 billion in 2007 to 245 billion in 2012 and shows no signs of slowing down (Sun, 2017).

https://www.afro.who.int/health-topics/diabetes
Gestational Diabetes Mellitus (GDM)

- The Hyperglycemia and Adverse Pregnancy Outcome Study reported that an average of 17.8% of pregnancies are affected by GDM and its frequency as high as 25.5% in some countries. (Silva-Zolezzi, 2017).

Gestational Diabetes

[SNOWMED]: 1700 Patients in Past 8 Years

This research was supported by grant T15LM011271
668 Hispanic Women Diagnosed with Gestational Diabetes
Studies had demonstrated that physiological intervention can increase diabetes treatment adherence, improve glycemic control and improve psychosocial functioning. (Rosenbloom, 2003).

Telemedicine allow diabetes care to go directly into the patient home, minimizing disruption for diabetes clinic visits and improving touch points with the care team (Prahalad, 2018).
Geospatial regions have been associated with increased smoking, physical inactivity and poorer control of blood pressure which can contribute to development of diabetes and its complications (Spanakisis, 2013).
### UCSD Top 9 Zip Codes by Volume with Diabetes

<table>
<thead>
<tr>
<th>Zip Code</th>
<th>Diabetic Patients (Alive or Deceased) Since 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Others</td>
<td>70,537</td>
</tr>
<tr>
<td>91911</td>
<td>1,441</td>
</tr>
<tr>
<td>91950</td>
<td>1,355</td>
</tr>
<tr>
<td>92101</td>
<td>1,986</td>
</tr>
<tr>
<td>92103</td>
<td>1,730</td>
</tr>
<tr>
<td>92105</td>
<td>2,039</td>
</tr>
<tr>
<td>92113</td>
<td>1,915</td>
</tr>
<tr>
<td>92114</td>
<td>1,688</td>
</tr>
<tr>
<td>92126</td>
<td>2,148</td>
</tr>
<tr>
<td>92231</td>
<td>1,520</td>
</tr>
<tr>
<td>92243</td>
<td>1,579</td>
</tr>
</tbody>
</table>

This research was supported by grant T15LM011271
Comprehensive Diabetes Care: HbA1c Poor Control (>9.0%)

This research was supported by grant T15LM011271
Quality Improvement Program

Comprehensive Diabetes Care: A1C Control

Comprehensive Diabetes Care: Eye Exam

Comprehensive Diabetes Care: Blood Pressure Control

This research was supported by grant T15LM011271
Building a Culture for Intolerance of the “Never” Outcomes

- Stroke
- Blindness
- Dialysis
- Amputation
- Death

Uncontrolled Diabetic Mellitus

This research was supported by grant T15LM011271

Never Outcomes – 2200 Stroke Patients at UCSD

Diabetic Patients with Stroke by ICD by Race

- White: 1,081
- Other Race or Mixed: 572
- Asian: 317
- Black/African American: 184
- Unknown: 91
- Native American: 16
- American Indian: 10
- None of the above: 8

This research was supported by grant T15LM011271
Never Outcomes – 250 Diabetics with Blindness
Table 4

Quality-of-Life Losses

<table>
<thead>
<tr>
<th>Quality-of-Life Measure</th>
<th>0–17 Years of Age</th>
<th>18–39 Years of Age</th>
<th>Total Younger than 40 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>QALY losses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual impairment</td>
<td>79 799</td>
<td>110 534</td>
<td>190 333</td>
</tr>
<tr>
<td>Blindness</td>
<td>1663</td>
<td>23 177</td>
<td>24 840</td>
</tr>
<tr>
<td>Total QALYs lost</td>
<td>81 462</td>
<td>133 711</td>
<td>215 173</td>
</tr>
<tr>
<td>Monetary value of quality-of-life losses</td>
<td>$4073</td>
<td>$6686</td>
<td>$10 759</td>
</tr>
</tbody>
</table>

QALY — quality-adjusted life year.
Units of measure for the first 3 rows are QALYs.
*Monetary costs are in millions.
UCSD General Risk for Diabetes: More than 12,000 Patients WITH High Risk Score >20

This research was supported by grant T15LM011271
Never Outcomes – 880 Diabetics on Dialysis or Kidney Transplant

Diabetic Patients (Ethnicity) with CKD and Dialysis or Kidney Transplant

- None of the Above: 1.56%
- Asian/Pacific Islander: 0.00% (0.19%)
- African American: 0.11% (0.17%)
- Caucasian: 0.11% (0.92%)
- Unknown: 0.45% (2.27%)

- Non-Hispanic: 44.55% (64.94%)
- Hispanic: 29.96% (54.43%)

This research was supported by grant T15LM011271
### Total Patients with Amputations (Race)

<table>
<thead>
<tr>
<th>Race</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>149</td>
</tr>
<tr>
<td>Other race or mixed</td>
<td>76</td>
</tr>
<tr>
<td>Black/African American</td>
<td>24</td>
</tr>
<tr>
<td>Asian</td>
<td>8</td>
</tr>
<tr>
<td>American Indian</td>
<td>3</td>
</tr>
</tbody>
</table>

### Total Patients with Amputations (Ethnicity)

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic</td>
<td>129</td>
</tr>
<tr>
<td>Hispanic</td>
<td>124</td>
</tr>
<tr>
<td>Caucasian</td>
<td>2</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
</tr>
</tbody>
</table>

Never Outcomes – 266 Diabetics with Amputations
Never Outcomes – Nearly 300 Patients are Known to Die with Diabetes each Year
Cost and Utilization

- Substantial increases in total economic costs in the US from 174 billion in 2007 to 245 billion in 2012 and shows no signs of slowing down (Sun, 2017).

This research was supported by grant T15LM011271

https://www.diabetes.org/resources/statistics
The average costs for patients 65–74 years of age, 75–84, and 85 plus were, $10,778, $16,389, and $25,691, respectively (12).

Our diabetic patients contributed to an estimated lifetime cost of ½ a billion for UCSDH alone.

ALIVE DIABETICS WITH CABG AS OF 2018

UCSD PATIENTS

2,500

U.S.A PATIENTS

340,000
Acknowledgements

- Dr. Amy Sitapati

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