ERECTILE DYSFUNCTION
THE IMPACT OF DIABETES ON PROGRESSION AND TREATMENT

THOMAS J. WALSH, MD, MS

OCTOBER 8TH, 2016

2016 WASHINGTON DIABETES SUMMIT
In compliance with accrediting board policies, the American Diabetes Association requires the following disclosure to participants:

NAME OF PRESENTER: Thomas J. Walsh

Research Support: None
Employee: None
Speaker’s Bureau: None
Board Member/Advisory Panel: None
Stock/Shareholder: Counsyl Genetics
Consultant: Boston Scientific, Coloplast
Other: None
1. Define erectile dysfunction

2. Describe the occurrence of E.D. in the U.S.

3. Understand the association between E.D., diabetes and cardiovascular health

4. Develop a basic understanding of the treatments available for E.D. among men with diabetes
## STATE OF MEN’S HEALTH

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High cholesterol</td>
<td>25%</td>
<td>28%</td>
<td>29%</td>
<td>30%</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>23%</td>
<td>25%</td>
<td>30%</td>
<td>32%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>10%</td>
<td>11%</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>Obesity</td>
<td>20%</td>
<td>25%</td>
<td>29%</td>
<td>32%</td>
</tr>
</tbody>
</table>

*Centers for Disease Control 2012 statistics*
HOW MEN & WOMEN USE HEALTHCARE SERVICES

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Number of visits per 100 persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>All ages</td>
<td>300</td>
</tr>
<tr>
<td>Under 15</td>
<td>250</td>
</tr>
<tr>
<td>15–24</td>
<td>200</td>
</tr>
<tr>
<td>25–44</td>
<td>150</td>
</tr>
<tr>
<td>45–64</td>
<td>200</td>
</tr>
<tr>
<td>65–74</td>
<td>450</td>
</tr>
<tr>
<td>≥75</td>
<td>700</td>
</tr>
</tbody>
</table>

Women: Gray bars
Men: Green bars

Centers for Disease Control 2003 Statistics

UW Medicine
What is ED?
The inability to maintain an erection firm enough to have sexual intercourse

How common is it?
• ~1 in 5 American men ≥ 20 years old
• Over 30 million American men
AMONG MEN 40 TO 49 YEARS OLD

More than half of men over 40 have some degree of ED\(^1\)

The risk of E.D. and its severity increase with age\(^2,3\)


ED: WHO DOES IT AFFECT?

Severity of Erectile Dysfunction

AGE (years)

40
45
50
55
60
65
70

0% 50% 100%

None
Mild
Moderate
Complete

UW Medicine
1. Impaired bioavailability of Nitric oxide (NO)
2. Oxidative stress (free radical damage) interferes with NO.

ENDOTHELIAL DYSFUNCTION

- Precedes atherosclerosis
- Caused by vascular insults
  - Diabetes
  - Tobacco smoking
  - Hyperlipidemia
  - Hypertension

Maas et al, Vasc Med, 2002
Potential to decrease cardiovascular morbidity (and perhaps mortality)

- Functional obstruction first...
- Lipid rich minor lesions (<50% stenosis) are most dangerous

_Hobbs, Heart, 2004_

Improvements in erectile function

- Aggressive lipid lowering improves erectile function

_Bank, et al. Vasc Med. 2006_
ARTERIAL DIAMETER

- **Penile arteries** (1-2 mm)
- **Coronary arteries** (3-4 mm)
- **Carotid arteries** (5-7 mm)
- **Femoral arteries** (6-8 mm)

Montorsi et al, Eur Urol, 2003
WHY TREAT ENDOTHELIAL DYSFUNCTION?

Potential to decrease cardiovascular morbidity (and perhaps mortality)

- Functional obstruction first...
- Lipid rich minor lesions (<50% stenosis) are most dangerous

*Hobbs, Heart, 2004*

Improvements in erectile function

- Aggressive lipid lowering improves erectile function

*Bank, et al. Vasc Med. 2006*
4,247 men WITHOUT ED or CVD at the start of the trial

7 years of follow-up
65% developed ED

Men with incident ED had increased risk of MI or angina HR=1.4 (95%CI 1.1, 1.8)

As strong a risk factor as smoking, family history, and dyslipidemia

Thompson IM, et al. Erectile Dysfunction and Subsequent Cardiovascular Disease. JAMA 294(23): 2996-02, 2005
ED: RELATIONSHIP TO HEART HEALTH
Low risk

- Asymptomatic, < 3 risk factors for CAD, controlled HTN, mild stable angina, s/p successful revascularization, uncomplicated previous MI, CHF (NYHA class I).*

Intermediate risk

- > 3 risk factors for CAD, moderate stable angina, recent MI (>2, < 6 weeks), CHF (NYHA class II), h/o CVA or PVD.
- Recommend specialized CV testing then re-stratification into low vs. high risk groups.

High risk

- Unstable angina, uncontrolled HTN, CHF (NYHA class III/IV), Recent MI < 2 wks, High risk arrhythmias, severe vascular disease.
THE CAUSES OF ED

- **Vascular** - 40%
- **Diabetes** - 30%
- **Pelvic Surgery or Radiation** - 6%
- **Neurological** - 5%
- **Medications** - 15%
- **Hormonal** - 3%
- **Other** - 1%
DIABETES - THE EPIDEMIC

- 15.5 million men in the US have diabetes
- 35-90% (5.4-14M) of patients with DM have ED
- The worldwide diabetic population is expected to reach 366 million by 2030

ED appears to arise about 10-15 years earlier in men with DM compared to the general population.

UW Medicine
136,306 men were identified Jan 2002-Dec 2006 from United Healthcare data

19,236 men had DM that preceded their ED diagnosis

Men with DM 50% more likely to be prescribed secondary ED treatments

More than 2 times more likely to undergo Penile Prosthesis surgery

MEN WITH DIABETES REQUIRE MORE AGGRESSIVE TREATMENT FOR ERECTILE DYSFUNCTION
TREATMENT: GOAL-BASED THERAPY

1. Education
2. Counseling
3. Lifestyle/medication change
4. Oral medications
5. Vacuum device
6. Suppositories
7. Injections
8. Penile implants
TREATMENT: A TYPICAL CLINIC PLAN

Visit 1
- Patient story and exam
- Additional testing or cardiovascular risk assessment?
- Medication?

Visit 2
- Did it work?
- More advanced therapy?
- Referral?

Visit 3
- Did it work?
- Referral?
TREATMENT

Oral therapy works. Until it doesn’t.

✓ Re-challenge with same agent\(^1\)
✓ Switch to another medication\(^2\)
✓ Try a different approach.

\(^1\)McCullough, et al, Urology, 2002; Atiemo, J Urol. 2003
PDE ISOENZYMES IN THE MALE BODY

PDE 1 Heart, lung, brain, vascular smooth muscle
PDE 2 Adrenal cortex, brain, heart, olfactory
PDE 3 Pancreas, smooth muscle, platelets, heart, fat
PDE 4 Brain, lung, lymphocytes
PDE 5 Corpus cavernosum
PDE 6 Retina
PDE 7 Skeletal muscle, lymphocytes
PDE 8 Testis, eye, liver, skeletal muscle, heart
PDE 9 Kidney
PDE 10 Testis, brain
PDE 11 Testis, skeletal muscle, prostate, kidney
INTRAURETHRAL ALPROSTADIL (MUSE)
INTRACAVERNOSAL INJECTION
HOW DOES IT WORK?
SURVIVAL AND SATISFACTION

<table>
<thead>
<tr>
<th></th>
<th>Mechanical survival</th>
<th>Patient satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>98%</td>
<td>98%</td>
</tr>
<tr>
<td>5 years</td>
<td>89%</td>
<td>99%</td>
</tr>
<tr>
<td>10 years</td>
<td>79%</td>
<td>99%</td>
</tr>
<tr>
<td>15 years</td>
<td>71%</td>
<td>98%</td>
</tr>
</tbody>
</table>

① Every man with diabetes can have his erectile function restored
② Don’t neglect heart health and the motivational moment
③ Provide goal directed therapy
④ Identify patients at risk for primary treatment failure
⑤ Refer to specialist early
YOUR QUESTIONS
THANK YOU

Thomas J. Walsh, MD, MS
Appointments 206.598.6358
Nurse 206.598.0358
Cell 206.660.7634
Email walsht@uw.edu