Comprehensive Treatment Approach to Patients with Diabetes and Obesity

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Comprehensive Care

• Prevention of complications
• Including micro and macrovascular complications
• Gluco-centric
• Lipid-centric
• BP-centric
• Obese-centric
Goals of Comprehensive Interventions

- Prevent short and long term complications
- Prevent early death
- Improve quality of life

Determinant Factors for Therapeutic Success

- Discussion of treatment goals and strategies
- Selection of appropriate therapies
- Tolerability and adherence to therapy
- Frequent assessments of goal attainment
- Intensification and/or modifications of therapies

EDUCATION, EDUCATION, EDUCATION
Attainment of Treatment Goals in Diabetes

Frequency of Exam

<table>
<thead>
<tr>
<th>Goal</th>
<th>Frequency Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1C</td>
<td>77%</td>
</tr>
<tr>
<td>LDL</td>
<td>54%</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>95%</td>
</tr>
</tbody>
</table>

Adapted from Beaton SJ. Diabetes Care 2004; 27: 694

Physician’s Considerations When Initiating Therapy

- Evidence-Based Guidelines
- Hypoglycemia
- Weight gain
- Side Effects
- Lawsuits
- Health Insurance Coverage
- Time Investment
- Competing Comorbidities
- Available Resources
- Skepticism
- Patient’s Compliance
- Effica
Patient's Thoughts
When Diagnosed with Diabetes

Clinical Inertia:
Do Specialists Differ From Primary Care?

Type 2 diabetes, age >65 years, A1C > 8%
Specialist care (n=591); Primary Care (n=1911)
Barriers to Comprehensive Management

Clinical Inertia
Failure of health care providers to intensify medical management

Patient non-adherence
Failure of patients to initiate or continue physician-recommended changes in medical management

Recommendation for Patients with Diabetes

<table>
<thead>
<tr>
<th>Lipids</th>
<th>Glucose</th>
<th>Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>•LDL &lt;100 mg/dl</td>
<td>•A1c &lt;7.0%</td>
<td>&lt;130/80mmHg</td>
</tr>
<tr>
<td>•Optional &lt;70</td>
<td>•qAC 70-140 mg/dl</td>
<td>Every Visit</td>
</tr>
<tr>
<td>•HDL &gt;40/50 mg/dl</td>
<td>•as needed</td>
<td></td>
</tr>
<tr>
<td>•Trig &lt;150mg/dl</td>
<td>•after meal &lt;180</td>
<td></td>
</tr>
<tr>
<td>At least annually</td>
<td>as needed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Eye Care</th>
<th>Smoking Cessation</th>
<th>Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annually</td>
<td></td>
<td>Every Visit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Foot Care</th>
<th>Weight</th>
<th>Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annually</td>
<td>BMI 18.5-24.9</td>
<td>Every Visit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Kidney Function</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Annually</td>
<td></td>
</tr>
</tbody>
</table>
Comprehensive Approach to DM

- Lifestyle Modification
  - Focus on Weight Loss
    - Medical Nutrition Therapy: RD
    - Exercise
    - Possibly medications/surgery
  - Blood Pressure control
  - Lipid Control
  - Glycemic Control – CDE, Nurses (and you, of course)
- Screening and management of complications
  - Ophthalmologist, Dentist, Podiatrist, Cardiologist, Nephrologist
• Goal is to set up an *individualized* diet plan to control calorie intake such that glycemic, lipid and weight loss goals can be attained without compromising nutritional quality.

• Unknown what is “perfect” breakdown of macronutrients (carbs/proteins/fat)

*Diabetes Care* January 2008 vol. 31 no. Supplement 1 S61-S78

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• Even 5% weight loss can have significant effects on glucose metabolism

• How to “fudge” someone’s basic metabolic calorie expenditure:
  – Men: 14 kcal/lb
  – Women: 12 kcal/lb

• Typically for weight loss of 1 lb/week, subtract 500 kcal/day

*Escott-Stump S. Nutrition and Diagnosis-Related Care, 5th, Lippincott Williams & Wilkins, Hagerstown, MD 2002.*
Exercise

• 150 minutes a week
• No more than two consecutive days without breaking a sweat
• Should include weight/resistance training
CVD Risk Management

- Lipid management
- Blood pressure control to <130/80 or lower if tolerated
- Aspirin therapy
- Smoking cessation
- Weight management

Lipid Control in Diabetes

- Fasting lipid panel should be done annually
- Diet low in cholesterol and saturated and trans fats
- LDL is primary target (<100 mg/dL, <70 mg/dL if known CVD)
Management Recommendations: Dyslipidemia/Lipids

Treatment recommendations and goals (2)
- Statin therapy should be added to lifestyle therapy, regardless of baseline lipid levels
  - with overt CVD (A)
  - without CVD >40 years of age who have one or more other CVD risk factors (A)
- For patients at lower risk (e.g., without overt CVD, <40 years of age) (E)
  - Consider statin therapy in addition to lifestyle therapy if LDL cholesterol remains >100 mg/dL
  - In those with multiple CVD risk factors
- If targets not reached on maximal tolerated statin therapy
  - Alternative therapeutic goal: reduce LDL cholesterol ~30–40% from baseline (A)

Target Blood Pressure is < 130/80
- Measure at every office visit
- Recommend low sodium (DASH diet), moderate EtOH consumption, exercise
- First-line Rx is ACE inhibitor or ARB
- What is best second-line?

**Recommendations: Antiplatelet Agents (1)**

- Consider aspirin therapy (75–162 mg/day) (C)
  - As a primary prevention strategy in those with type 1 or type 2 diabetes at increased cardiovascular risk (10-year risk >10%)
  - Includes most men >50 years of age or women >60 years of age who have at least one additional major risk factor
    - Family history of CVD
    - Hypertension
    - Smoking
    - Dyslipidemia
    - Albuminuria

**Glycemic Targets**

- **Hemoglobin A1C:**
  - 6.5-7.0% for most patients*
- **Blood Glucose:**
  - Fasting:
    - <110-130 mg/dL
  - Post-Prandial:
    - <140-180 mg/dL
* Must individualize
**Goals for Glycemic Control**

**A1c ≤ 6.5%**
For healthy patients without concurrent illness and at low hypoglycemic risk

**A1c > 6.5%**
Individualize goals for patients with concurrent illness and at risk for hypoglycemia

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**Glycemic Control Algorithm**

* ENTRY A1c < 7.5%*  
** ENTRY A1c ≥ 7.5%**  
** ENTRY A1c > 9.0%**

**Lifestyle Modification** (Including Medically Assisted Weight Loss)

**Monotherapy**
- Metformin
- GLP-1 RA
- SGLT-2
- DPP-4
- TZD
- MIG-N

If A1c > 6.5% in 3 months add second drug (Dual Therapy)

**Dual Therapy**
- GLP-1 RA
- TZD
- SGLT-2
- DPP-4
- Metformin

If not at goal in 3 months proceed to triple therapy

**Triple Therapy**
- GLP-1 RA
- TZD
- SGLT-2
- DPP-4
- Metformin
- Other oral agent

If not at goal in 3 months proceed to or intensify insulin therapy

**Add or Intensify Insulin**

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*Order of medications listed is a suggested hierarchy of usage
**Based upon phase 3 clinical trials data

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**Progression of Disease**

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### Profiles of Antidiabetic Medications

<table>
<thead>
<tr>
<th></th>
<th>NET</th>
<th>DPP-4i</th>
<th>GLP-1 RA</th>
<th>TZD</th>
<th>AGI</th>
<th>GLP-1</th>
<th>ECR</th>
<th>GLN</th>
<th>SL1</th>
<th>GLN</th>
<th>INSULIN</th>
<th>SGLT-2</th>
<th>PRAML</th>
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<tbody>
<tr>
<td>HYPO</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Moderate/Severe</td>
<td>Moderate to Severe</td>
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<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
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<tr>
<td>WEIGHT</td>
<td>Slight Loss</td>
<td>Neutral</td>
<td>Loss</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Gain</td>
<td>Gain</td>
<td>Gain</td>
<td>Loss</td>
<td>Loss</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RENAL/GI</td>
<td>Contr.-indicated Stage 3R,4,5</td>
<td>Dose Adjustment May be Necessary (except Sulfonylurea)</td>
<td>Renal failure or contr.-indicated CrCl &lt; 30</td>
<td>May worsen Fluid Retention</td>
<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>More Hypo Risk</td>
<td>More Hypo Risk &amp; Fluid Retention</td>
<td>Infections</td>
<td>Neutral</td>
<td></td>
<td></td>
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<tr>
<td>GL Sr.</td>
<td>Moderate</td>
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<td>Safe</td>
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<td>? Bone Loss</td>
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<tr>
<td>BONE</td>
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<td>Neutral</td>
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<td>Neutral</td>
<td>Neutral</td>
<td>Neutral</td>
<td>? Bone Loss</td>
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<td>Neutral</td>
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![Legend](https://example.com/legend.png)

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**Monitoring of Microvascular Complications**

- **Annual foot exam with 10g monofilament and at least one of the following:**
  - temperature perception
  - vibration perception (using a 128-Hz tuning fork)
  - ankle reflexes
- **Annual spot urine for microalbumin and serum creatinine**
- **Annual dilated eye exam**
Monitoring of Microvascular Complications

- Annual foot exam with 10g monofilament and at least one of the following:
  - temperature perception
  - vibration perception (using a 128-Hz tuning fork)
  - ankle reflexes
- Annual spot urine for microalbumin and serum creatinine
- Annual dilated eye exam

Diabetes Management Checklist

✓ **Every 3-4 months**
  ✓ A1c, review GM data
  ✓ Weight, waist & BP

✓ **Annual**
  ✓ Dilated eye exam
  ✓ Lipids
  ✓ Foot inspection (must be documented)
  ✓ Flu shot
  ✓ Spot urine for MA/Cr ratio
  ✓ Dental examination
  ✓ Discuss birth control and smoking cessation if appropriate

✓ **Pneumovax at diagnosis and every 5-6 years**
✓ Review tetanus status
✓ Consider Hepatitis A & B Immunization
✓ Consider Shingles Immunization
Evidence and Benefits of Team Care

- reduced risk factors for diabetes
- improved diabetes management
- lowered risk for complications
- efficient patient education
- improved glycemic control
- increased patient follow-up
- higher patient satisfaction
- improved quality of life
- reduced hospitalizations
- decreased health care costs

Creating the Diabetes Team

- Locate the nurse educators & dietitians within your practice area
  - Certified Diabetes Educator (CDE) status preferred
- Create process for referral of patients for basal/bolus diabetes education
- Create process for feedback & communication among patient, physician and educator
What Makes a Successful Team?

• Commitment/support of organizational leadership
• Active patient and health care professional participation
• Information tracking system
• Adequate resources
• Payment mechanisms for team care services
• Coordinated communication system
• Documentation and evaluation of outcomes and adjustment of services