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Preventing the Progression of Prediabetes to Type 2 Diabetes Mellitus Through Increasing Physical Activity and Healthy Diet

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### Patient Care Issue

#### Background & Significance of Diabetes Mellitus
- Diabetes Mellitus is a rapidly growing worldwide health phenomenon.
- The number of diabetics worldwide in 1995 was 135 million people and is predicted to be 300 million people in 2025.
- Prediabetes is defined by elevated blood glucose levels.
- Early intervention can reverse the disease process progression.
- A person can reduce risk of DM2 by 58% by reducing body weight by 7% and consistently exercising.
- Decreasing body weight and increasing physical activity significantly reduces the risk of developing diabetes.

#### Evidence-Based Practice Question

**Question:** What lifestyle modification, diet or exercise, has the strongest evidence base for reducing the progression of Type 2 diabetes during the prediabetic phase? What is the effectiveness of diet modification versus increased physical activity during the prediabetic phase in reducing the progression to Type 2 diabetes?

**P:** Adults ages 18-49 with diagnosis of prediabetes

**I:** Lifestyle modifications to slow progression of disease

**C:** Diet or exercise is more effective in decreasing disease progression

**O:** Determine the most effective intervention

### Registered Nurse Interview

Springfield Regional Medical Center Medical Surgical RN and Case Manager interviewed but unaware of hospital policy:
- Interventions are per nurse’s clinical judgment, but this is not a widespread inpatient diagnosis

Springfield Regional Medical Center Diabetes Educator RN interviewed:
- Education with visual aids about diabetes and lifestyle changes accompany every diabetes diagnosis; however there is no set protocol for preclinical diabetic diagnoses

Leesburg Regional Medical Center Patient Safety Coordinator RN interviewed:
- Diet modification education is most important intervention
- There is a great need for full-time diabetic educators

Exhausted four databases:
- CINAHL, Academic Search Complete, Cochrane Database of Systematic Reviews, Food Science Source

#### Methods

**Inclusion criteria:**
Publication of research within past 7 years, focus on the prediabetic state, exercise, diet or other general lifestyle modification

**Exclusion criteria:**
Non-English articles, solely focused on the full onset of diabetes

**Key words searched:**
Prediabetic state, interventions, physical activity, prevention, diet

### Results

<table>
<thead>
<tr>
<th>Articles Examined</th>
<th>Articles Used</th>
<th>Levels of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>6</td>
<td>Four meta-analyses (Level 1) Four well designed RCTs (Level 2) One case-control study (Level 4)</td>
</tr>
</tbody>
</table>

### Synthesis of Evidence

The following lifestyle interventions were considered.
- Physical activity: two case studies, one literature review
- Lesser insulin resistance
- Insufficient supporting evidence
- Dietary modifications: one study, two systematic reviews
- Weight and risk for developing diabetes decreased
- No statistically significant differences between exercise alone and diet combined with exercise
- Insufficient supporting evidence

### Evidence-Based Practice Recommendations

- Hospital protocols should not be amended based on current results
- Patient education regarding both diet and physical activity modifications should continue
- More controlled studies need to occur before protocol changes can be recommended

### Limitations

- Further research is needed for recommendation regarding clinical practice
- There is no evidence that reveals one intervention, diet or physical activity, as more effective than the other
- More high-quality studies needed

### Acknowledgements

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### References