Evidence-Based Practice as a Curricular Thread: Bridging Research to Practice for Students

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Why Conceptual Based Approach?

• Content Saturation
  – Health Education is dealing with content saturation; there is more content than can be possibly taught in any given curriculum.

• Information Age
  – Explosion of the information age has lead to changes in how information is generated and how knowledge is diffused
  – The future skill set is information management.
Information Management

OLD APPROACH

How much students know

NEW APPROACH

Locating, analyzing, interpreting, and applying knowledge
What is a Concept?

- A concept is an organizing principle or a unifying classification of information. **Comfort**

- Exemplars will be used to increase understanding of the concepts
  - An exemplar is a classic clinical example of the concept. **Chronic Pain**
What is a Curricular Thread?

• An integrated theme throughout a curriculum
• Used to unite individual courses in a curriculum

Students should be exposed to these threads early in their education and continually be challenged to integrate these threads into their learning under increased complexity.
## SVSU Curricular Threads

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<th>Threads</th>
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<td>Communication</td>
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<tr>
<td>Care Management</td>
<td>An overview of all threads is provided in the 1&lt;sup&gt;st&lt;/sup&gt; semester</td>
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<td>Safety</td>
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<td>Prof Identity</td>
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<td>Pt Centered Care</td>
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<td>4&lt;sup&gt;th&lt;/sup&gt; &amp; 5&lt;sup&gt;th&lt;/sup&gt; semester</td>
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Evidence-Based Practice as a Curricular Thread

- A thread versus a concept is in every level of the program and ties together many concepts.
- Separate courses can have the unfortunate consequence of students thinking of research and EBP as related to only that one course and not critical to practice.
Evidence-Based Practice

• Institute of Medicine (IOM) and QSEN (Quality and Safety Education for Nurses)
• Definition: Integration of best current evidence with clinical expertise and patient/family preferences for delivery or optimal health care (Cronenwett, et al., 2007)
• Goal at the end of the program is that new graduates will be able to contribute to the culture of quality and safety in practice
Evidence-Based Practice KSAs

• QSEN defines knowledge, skills and attitudes (KSAs) related to EBP

<table>
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<tr>
<th>Knowledge</th>
<th>Skills</th>
<th>Attitudes</th>
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<td>Describe EBP to include...</td>
<td>Read original research...</td>
<td>Value the concept of EBP</td>
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<tr>
<td>Describe reliable sources...</td>
<td>Locate evidence reports...</td>
<td>Appreciate the importance of reading journals...</td>
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• These KSAs can help level the EBP thread across the program
AACN Roles for Baccalaureate Generalist Nurse

• **Nurse Provider**
  – Providers of direct and indirect care
  – Patient advocates, educators, partners
  – Practice from a holistic, caring framework
  – Provides care across all environments

• **Nurse Designers, Coordinators, and Managers of care**
  – Knowledge and authority to delegate tasks
  – Supervise and evaluate others
  – Accountable for professional practice and image and patient outcomes
  – Member of team

• **Members of the Profession**
  – Advocates for patients and profession
  – Accountable for professional identity and one’s professional image
  – Use knowledge, critical thinking, communication, assessment
  – Practices using values and ethical framework
  – Commits to lifelong learning
Use of EBP in an early course

• The major course concepts deal with chronicity in the provider course and EBP is presented in the designer course as well as utilized in the integration course which uses simulation.

• There is an embedded librarian in the course who is available on the electronic learning platform.
Assignment One – evidence for wound care technique

• The embedded librarian spends four hours with the students teaching them search techniques, data bases, interlibrary loan techniques, and doing the actual searches with the students

• Each group of students has a specific wound care topic (examples: second degree burns, clean versus sterile technique for ulcer care)
In the simulation/integration course, the student groups (having completed the search for evidence) meet with faculty and support staff members (including the wound care specialist from the local hospital) and then demonstrate to the class the best practice techniques on mannequins with simulated wounds.
Simulation and EBP

- Brady (2011) writes about using EBP (as well as other QSEN competencies) in the design of simulations. The importance of using the local experts in helping students to understand how to incorporate clinical expertise and patient values needs to be incorporated in the simulation. Use of the wound care expert and asking the hospital staff nurses what students needed to know about wounds made use of local evidence.
Simulation and EBP

- Jarzemoky, McCarthy & Ellis (2010) recommend a task analysis for the simulation to specifically address the KSAs in the simulation. Here they are:
  - Describe EBP to include research evidence and clinical expertise
  - Differentiate clinical opinion from evidence
  - Use reliable sources
  - Locate and read EBP reports related to a clinical problem
  - Value the concept of EBP as integral to best practice
Second Assignment

The exemplar of diabetes and pre-diabetes was selected as a common chronic disease. In groups, students identified the evidence for interventions frequently associated with this chronic disease (such as exercise, diet, education).

With the faculty, the groups wrote PICO questions rated the strength of the evidence, made recommendations, created a poster and presented it to other students.
Second assignment added KSAs

• Explain the role of evidence in determining best clinical practice
• Describe the strength and relevance of available data
• Appreciate the importance of regularly reading relevant professional journals
Evidence for Treatment of Diabetes Mellitus Type II With Glucagon-like Peptide-1

Melanie Rhein, Mariah Droth, Beth McNutt, Majelina Fannemeg-Noumi, Jonah Routowitz, Shelby Dewald, Jessalyn Creen, and Hillary Buesch

Background
- There were 366 million people with diabetes mellitus worldwide in 2011, and it is estimated that there will be 552 million people affected by 2030.
- Type II diabetes is a disease that is characterized by insulin sensitivity or resistance, as well as decreased beta-cell insulin secretion, causing impairment in blood glucose control (Flint, Kapita, Hindesber, & Zdrujkovic, 2011).

- A new class of drugs called Glucagon-like peptide analogues are used to treat type II diabetes by mimicking GLP-1, which is a hormone that is released in response to eating. It stimulates glucose dependent insulin secretion and suppresses glucagon secretion to regulate glucose levels (Shyngalan, Royle, Sharma, & Waugh, 2011).
- GLP-1 analogues also decreases gastric emptying and motility, as well as decreasing appetite that lowers blood glucose as well as increasing weight loss (Pejnglos, Pi-Sunyer, Saad, An, & Santiago, 2005).

PICO Question
- P: the population includes patients with type II diabetes
- I: The intervention is use of glucagon-like peptide analogue medications, that mimic GLP-1 hormone
- C: The comparison includes no treatment for glucose control
- O: The outcome is improved glucose control in patients with type II diabetes

GLP-1 is an important component in glycemic regulation

- The actions of GLP-1 are dependent on food intake: and GLP-1 is short-lived
- Stimulates glucose dependent insulin secretion
- Improves first phase insulin response
- Suppresses postprandial glucagon secretion, which decrease hepatic glucose production
- Slows gastric emptying
- Reduces food intake
- This effect is mediated through the central nervous system

Recommendations
Based on high level evidence of four Level 1A articles (systematic reviews of randomized controlled trials), 14 level 2A articles on randomized controlled trials, 5 level 2B articles on non-randomized controlled trials, it is recommended that glucagon-like peptide analogues (GLP-1) should be given as a medication regimen for type II diabetes to control blood glucose levels.

References
**Background**
Pre-diabetes is defined by impaired glucose tolerance or impaired fasting glucose. Most people with pre-diabetes are overweight, and obesity worsens the metabolic and physiologic abnormalities associated with this condition. Pre-diabetes is an important risk factor for the development of type II diabetes.

**Facts:**
- Diabetes causes disabling complications, high health costs, and reduced life expectancy.
- In the US, 79 million adults have pre-diabetes.
- In the US, 26 million adults have diabetes.
- Studies show that exercising is just as important as dieting for maintaining your blood glucose level in the normal range.
- Normal blood glucose ranges for an adult is 80-120 mg/dL.
- People with pre-diabetes are 50 percent more likely to have a heart attack or stroke.
- Exercise promotes the transfer of glucose from your blood to your cells, therefore the more you exercise the more glucose you use, thus lowering the amount of glucose left in your blood.
- Exercise also makes your cells more responsive to insulin.
- It is estimated that diabetes costs have risen to $245 billion in 2012.

**Pre-diabetes and Exercise**
By: Emily Hoffman, Anita Kiss, Heather Kraft, Erin Lynch, Vishaya Singleton, Alyssa Skym, Jessica Smith, Wendy Todd

**Findings**
- Exercise of at least 150 minutes per week, for example 30 minutes a day for 5 days a week, will help in the prevention of type 2 diabetes.
- Exercise guidelines are based on the latest evidence and recommendations from the American Diabetes Association.
- The total Body Count of evidence was based on the combination of moderate intensity physical activity and resistance training. Based on the PICO Question, Exercise is the intervention of type 2 diabetes and can help reduce the risk of developing type 2 diabetes.
- A systematic review led to the conclusion that exercise is a key component of a healthy lifestyle and can help prevent or delay the onset of diabetes.
- The best type of exercise the exercise that you actually enjoy doing such as walking, dancing, swimming, or activities such as preventing diabetes.
- Exercise guidelines vary from light to moderate exercise.
- Each week, 20 minutes of aerobic exercise is recommended.
- The American Diabetes Association recommends at least 150 minutes of moderate-intensity aerobic activity each week.
- Exercise can improve insulin sensitivity, which is crucial in preventing type 2 diabetes.

**PICO Question**
Population: Prediabetes
Intervention: Exercise (Physical Activity)
Comparison: No Treatment (Usual Care)
Outcome: Glucose Control

In patients with prediabetes, does physical activity increase glucose control when compared to no physical activity?

**Recommendation**
Consistent findings from level 1 through level 7 of evidence show that 150 minutes of exercise per week, for example 30 minutes a day for 5 days, will help in preventing type 2 diabetes.
- Types of recommended exercise include combining aerobic and resistance, such as brisk walking while wearing ankle weights.

**References**
**Education on Prediabetes**

**P** – Our population are those individuals with prediabetes.

**I** – Our intervention will be education.

**C** – We aim for the intervention of education will be treatment.

**O** – Our population will understand the importance of lifestyle changes.

**Background**

Prediabetes refers to high blood glucose levels that are higher than normal but not high enough to be considered type 2 diabetes. Recent research shows that better control and lifestyle changes can help prevent or delay prediabetes from becoming type 2 diabetes. The American Diabetes Association (ADA) recommends lifestyle changes and/or medication to help control blood glucose levels in those with prediabetes. Type 2 diabetes education programs are designed to help patients manage their diabetes and improve their overall health.

**Search Terms**

Keywords: prediabetes, diabetes, lifestyle changes, blood glucose, type 2 diabetes, education program.

**EVIDENCE FOR EDUCATION ON PREDIABETES**

Recommendations based on the highest levels of research evidence on education and prediabetes. Using a prediabetes educational program that focuses on diet and physical activity is shown to be effective in maintaining blood glucose levels and preventing the transition to type 2 diabetes.

Our recommendation was constructed from three Level 1 and three Level 2 research articles.
PICO Question

Population: Prediabetes
Intervention: Exercise (Physical Activity)
Comparison: No Treatment (Usual Care)
Outcome: Glucose Control

In patients with prediabetes, does physical activity increase glucose control when compared to no physical activity?
P - Our population are those individuals with pre-diabetes

I - Our intervention will be education

C - We compared the intervention of education with no treatment

O - Our population will understand the importance of glucose control
Findings

- Exercising at least 150 minutes per week, or for example 30 minutes a day for five days, will help in the prevention of type 2 diabetes, based on the preventive diabetes guidelines from the National Guideline Clearinghouse.

- The total amount of exercise should consist of a combination of aerobic (e.g., brisk walking) and resistance training, based on the article, Exercise Prescription for Patients with Type 2 Diabetes and Prediabetes: A Position Statement from Exercise and Sport Science Australia, a level 7 of evidence published in 2012.

- Resistance training should make up two or more sessions each week (2-4 sets of 8-10 repetitions).

- Aerobic and resistance exercise could be combined into one session.

- The best type of exercise is the exercise that you will actually do. Exercise such as walking, biking, swimming or activity such as dancing, gardening or walking the dog are all effective ways of preventing diabetes, based on the Mayo Clinic Health Letter, Stop Prediabetes in its Tracks, at a level 7 of evidence published in 2012.

- Physical activity on average should consist of at least 150 minutes each week of brisk walking or other activities such as cycling or jogging, based on the article, Exercise and Diet for Prevention Type 2 Diabetes Mellitus, at a level 10 of evidence published in 2008.
## Evidence for Education on Prediabetes

<table>
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<tr>
<th>Article Name</th>
<th>Findings</th>
<th>Summary</th>
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<tr>
<td>Results Of A Pilot Diabetes Prevention Intervention in East Harlem, New York City: Project HEED</td>
<td>Experimental Study of Overweight Minority Communities</td>
<td>In this experimental study done in minority communities, prediabetes prevalence may be higher than previously reported. With the help of low-cost, community-based education interventions can succeed in encouraging weight loss to prevent diabetes.</td>
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<td>Prevention of type 2 diabetes in a primary healthcare setting: Three-year results of lifestyle intervention in Japanese subjects with impaired glucose tolerance</td>
<td>Randomized controlled trial of 304 middle aged IGT subjects with a mean body mass index of 25.5 kg/m²</td>
<td>This education intervention was carried out for 3 years by public health nurses using the curriculum and educational materials provided by the study group. The result after 3 years was insulin sensitivity improved along with body weight and the amount of exercise performed by the individuals.</td>
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<td>Rationale, design and baseline data from the Pre- Diabetes Risk Education and Physical Activity Recommendation and Encouragement (PREPARE) programme study</td>
<td>A randomized controlled trial of 103 individuals from South Asian ethnic background</td>
<td>This study demonstrates the importance of developing effective physical activity and self-management programmes for individuals with IGT. A successful framework was created for the promotion of physical activity in a population identified with an increased risk of developing type 2 diabetes.</td>
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<td>Diabetes Mellitus: Clinician Information</td>
<td>Systematic Review of Preventing Diabetes Mellitus</td>
<td>With the combination of Self-monitoring blood glucose and diet control people can manage their prediabetes.</td>
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<td>Long-Term non-pharmacological weight loss interventions for adults with prediabetes (review)</td>
<td>Systematic Review</td>
<td>Nine studies were identified, with a total of 5,000 participants. Overall weight loss strategies using dietary, physical activity, or behavioral interventions produced significant improvements in weight among persons with prediabetes and a significant decrease in diabetes incidence.</td>
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<tr>
<td>The Diabetes Prevention Program</td>
<td>Several Randomized clinical trials</td>
<td>This study demonstrates that existing worksite health promotion staff can use several</td>
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<tr>
<td>Title of Article</td>
<td>Level of Evidence</td>
<td>Summary of Finding</td>
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<td>“Glucagon-like Peptide Analogues for Type 2 Diabetes Mellitus”</td>
<td>1A</td>
<td>Using a systematic review of seventeen randomized controlled trials, with 6899 patients with type II diabetes, the glucagon-like peptide analogues caused more weight loss than any of the comparison treatments, beta-cell function was improved, and GLP-1 improved blood sugar control when compared to a placebo.</td>
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<td>“The Once-Daily Human Glucagon-Like Peptide-1 Analog Liraglutide Improves Postprandial Glucose Levels in Type 2 Diabetes Patients”</td>
<td>2A</td>
<td>Using a randomized trials of 18 patients with type II diabetes given Liraglutide, a GLP-1 analog, patients' postprandial plasma glucose levels decreased significantly, insulin levels increased and a significant delay in gastric emptying when compared to a placebo.</td>
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<td>“Noninsulin Treatment of Type 2 Diabetes Mellitus in Geriatric Patients: a Review”</td>
<td>1A</td>
<td>Using a systematic review of databases, GLP-1 analogues of Liraglutide and Exenatide have shown weight loss of approximately 3 kg, a low risk of developing hypoglycemia, and improved beta cell function in the pancreas to stimulate insulin secretion.</td>
</tr>
<tr>
<td>“Effects of 3 Months of Continuous Subcutaneous Administration of Glucagon-Like Peptide 1 in Elderly Patients with Type 2 Diabetes”</td>
<td>2B</td>
<td>Patients that were given GLP-1 for 12 weeks were studied and it was shown that it enhanced insulin secretion, improved beta cell function as well as had lower incidence of hypoglycemic effects when compared to oral glycemic medications.</td>
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</table>

**Recommendations**

Based on high level evidence of four Level 1A articles (systematic reviews of randomized controlled trials), 14 level 2A articles on randomized controlled trials, 5 level 2B articles on non-randomized controlled trials, it is recommended that glucagon-like peptide analogues (GLP-1) should be given as a medication regimen for type II diabetes to control blood glucose levels.
Across the program - SVSU

• At the next level the students will work with specific agencies to develop projects related to practice

• At the last two levels students will do EBP projects related to quality initiatives and recommendations for system change