How to Select or Create Materials Your Patients Can Actually Understand

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• AADE Public Health Community of Interest Co-Leader
• Co-Author of AADE Practice Advisory “Special Considerations in the Management and Education of Older Persons with Diabetes”
• NDEP Practice Transformation Task Group
Disclosure to Participants

• Notice of Requirements For Successful Completion
  • Please refer to learning goals and objectives
  • Learners must attend the full activity and complete the evaluation in order to claim continuing education credit/hours

• Conflict of Interest (COI) and Financial Relationship Disclosures:
  • Presenter: Linda Gottfredson, PhD – No COI/Financial Relationship to disclose
  • Presenter: Kathy Stroh, MS, RD, LDN, CDE – No COI/Financial Relationship to disclose

• Non-Endorsement of Products:
  • Accredited status does not imply endorsement by AADE, ANCC, ACPE or CDR of any commercial products displayed in conjunction with this educational activity

• Off-Label Use:
  • Participants will be notified by speakers to any product used for a purpose other than for which it was approved by the Food and Drug Administration.
“As clinicians, what we say does not matter unless our patients are able to understand the information we give them well enough to use it to make good health-care decisions.

Otherwise, we didn’t reach them, and that is the same as if we didn’t treat them.”

Surgeon General Regina Benjamin (2010)
“Two decades of research indicate that much health information is presented in ways that are not understandable by most Americans.

If health professionals want to reach people with information, they must make sure information, products, and services are accessible and understandable to their intended audiences.”

CDC (2014)
The neglected barrier: Lack of cognitive accessibility

Patients cannot adhere to treatment unless the information we give them is cognitively accessible.

So,

• How do we judge that?
• And how can we increase it, particularly for aging and low-literacy patients?
Learning Objectives

Participants will be able to:

• Define *cognitive accessibility* and explain why it is important in diabetes education.

• Identify DSMES materials that are *needlessly* complex for all patients (have poor *readability*).

• Identify DSMES materials that are *inherently* complex (even when highly *readable*), and why.

• Select or create DSMES materials that are cognitively accessible to patients, especially those who are cognitively compromised.
Outline of topics

1. Cognitive accessibility of DSMES information and instruction: What is it?
2. Needless complexity in DSM tasks: Tools to identify and eliminate it
3. Inherent complexity in DSM tasks: Tools to identify and reduce it
4. Examples of reducing complexity in the AADE7™
National Diabetes Statistics Report, 2017

Estimates of Diabetes and Its Burden in the United States

Background

The National Diabetes Statistics Report is a periodic publication of the Centers for Disease Control and Prevention (CDC) that provides updated statistics about diabetes in the United States for a scientific audience. It includes information on prevalence and incidence of diabetes, prediabetes, risk factors for complications, acute and long-term complications, deaths, and costs. These data can help focus efforts to prevent and control diabetes across the United States. This report was previously known as the National Diabetes Fact Sheet.

Methods

The estimates in this document (unless otherwise noted) were derived from various data systems of CDC, the Indian Health Service (IHS), the Agency for Healthcare Research and Quality (AHRQ), the U.S. Census Bureau, and published studies. The estimated percentages and the total number of people with diabetes and prediabetes were derived from the National Health and Nutrition Examination Survey (NHANES), National Health Interview Survey (NHIS), IHS National Data Warehouse (NDW), Behavioral Risk Factor Surveillance System (BRFSS), United States Diabetes Surveillance System (USDDS), and U.S. resident population estimates.

Numbers and rates for acute and long-term complications of diabetes were derived from the National Inpatient Sample (NIS) and National Emergency Department Sample (NEDS), as well as NHI. Diagnosed diabetes was determined by self-report among survey respondents and by diagnostic codes for American Indians and Alaska Natives who accessed IHS, tribal, or Urban Indian health facilities that submitted data to the IHS NDW.

Both fasting glucose and hemoglobin A1C (A1C) levels were used to derive estimates for undiagnosed diabetes and prediabetes. An alpha level of 0.05 was used when assessing statistical differences between groups.

Most estimates of diabetes in this report do not differentiate between type 1 and type 2 diabetes. However, because type 2 diabetes accounts for...
Higher rates of DM among the less educated

Table 1c. Age-adjusted prevalence of diagnosed diabetes by race/ethnicity, education level, and sex among adults aged ≥18 years, United States, 2013–2015

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total Percentage (95% CI)</th>
<th>Men Percentage (95% CI)</th>
<th>Women Percentage (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>15.1 (15.0–15.2)</td>
<td>14.9 (14.8–15.0)</td>
<td>15.3 (15.2–15.3)</td>
</tr>
<tr>
<td>Asian, non-Hispanic, overall</td>
<td>8.0 (7.3–8.9)</td>
<td>9.0 (7.6–10.5)</td>
<td>7.3 (6.4–8.3)</td>
</tr>
<tr>
<td>Asian Indian</td>
<td>11.2 (9.1–13.7)</td>
<td>12.2 (9.1–16.2)</td>
<td>10.0 (7.4–13.3)</td>
</tr>
<tr>
<td>Chinese</td>
<td>4.3 (3.2–5.9)</td>
<td>6.2 (4.1–9.1)</td>
<td>2.8 (1.8–4.4)</td>
</tr>
<tr>
<td>Filipino</td>
<td>8.9 (7.4–10.8)</td>
<td>9.1 (6.8–11.9)</td>
<td>8.9 (7.1–11.2)</td>
</tr>
<tr>
<td>Other Asian</td>
<td>8.5 (7.1–10.0)</td>
<td>8.0 (6.9–11.4)</td>
<td>8.2 (6.5–10.2)</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>12.7 (12.1–13.4)</td>
<td>12.2 (11.3–13.1)</td>
<td>13.2 (12.4–14.0)</td>
</tr>
<tr>
<td>Hispanic, overall</td>
<td>12.1 (11.4–12.7)</td>
<td>12.6 (11.6–13.5)</td>
<td>11.7 (10.9–12.5)</td>
</tr>
<tr>
<td>Central/South American</td>
<td>8.5 (7.3–10.0)</td>
<td>8.5 (6.6–10.8)</td>
<td>8.8 (7.2–10.7)</td>
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<tr>
<td>Cuban</td>
<td>9.0 (7.1–11.4)</td>
<td>11.6 (8.0–16.5)</td>
<td>5.0 (3.7–9.3)</td>
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<tr>
<td>Mexican</td>
<td>13.8 (13.0–14.8)</td>
<td>14.2 (12.9–15.7)</td>
<td>13.5 (12.5–14.7)</td>
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<td>Puerto Rican</td>
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<td>12.3 (10.0–14.0)</td>
<td>11.8 (9.8–14.1)</td>
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<tr>
<td>White, non-Hispanic</td>
<td>7.4 (7.2–7.6)</td>
<td>8.1 (7.3–8.5)</td>
<td>6.8 (5.5–7.1)</td>
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</tbody>
</table>

Education

<table>
<thead>
<tr>
<th>Education</th>
<th>Total Percentage (95% CI)</th>
<th>Men Percentage (95% CI)</th>
<th>Women Percentage (95% CI)</th>
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</thead>
<tbody>
<tr>
<td>Less than high school</td>
<td>12.6 (11.9–13.2)</td>
<td>12.2 (11.3–13.1)</td>
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<td>High school</td>
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<td>10.1 (8.5–10.8)</td>
<td>9.2 (8.6–9.8)</td>
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<tr>
<td>More than high school</td>
<td>7.2 (7.0–7.5)</td>
<td>7.9 (7.5–8.3)</td>
<td>6.6 (6.3–6.9)</td>
</tr>
</tbody>
</table>

CI = confidence interval

Data source: 2013–2015 National Health Interview Survey, except American Indian/Alaska Native data, which were from the 2015 Indian Health Service National Data Warehouse.

The Diabetes Educator and the Diabetes Self-management Education Engagement

The 2015 National Practice Survey

Dawn Sherr, MS, RD, CDE, LDN
Ruth D. Lipman, PhD
Educational status of DSME Participants:

- some college (17%)
- high school or GED degree (61%)
- some high school (13%)

(nearly identical to the proportions reported in 2012 (61%, 16%, 13%, respectively).
Outline of topics

1. **Cognitive accessibility of DSMES information and instruction: What is it?**

2. **Needless complexity in DSM tasks: Tools to identify and eliminate it**

3. **Inherent complexity in DSM tasks: Tools to identify and reduce it**

4. **Examples of reducing complexity in the AADE7™**
Patient’s-eye view of diabetes self-care

- Meds
- Interpret readings
- Monitor sugar
- Do A if low, Do B if high
- Coordinate meds & eating
- Don’t stress
- Exercise, except when...
- Sick day rules
- Adjust insulin
- What’s a carb??
- Count carbs
- Proper diet
- Read labels
- Check feet
- Call 911 for C, but doctor for D
### Objective: Keep blood glucose within safe limits & avoid complications

- **Learn about diabetes in general** *(Ongoing)*
  - Physiological process
  - Interdependence of diet, exercise, meds
  - Symptoms & corrective action
  - Consequences of poor control

- **Apply knowledge to own case** *(Daily, Hourly)*
  - Implement appropriate regimen
  - Continuously monitor physical signs
  - Diagnose problems in timely manner
  - Adjust food, exercise, meds in timely and appropriate manner

- **Coordinate with relevant parties** *(Frequently)*
  - Negotiate changes in activities with family, friends, job
  - Enlist/capitalize on social support
  - Communicate status and needs to practitioners

- **Update knowledge & adjust regimen** *(Occasionally)*
  - When other chronic conditions or disabilities develop
  - When new treatments are ordered
  - When life circumstances change

- **Conditions of work**—24/7, no days off, no retirement
The challenge of reaching DSM patients
What is cognitive access to care & self-care?

Cognitive access = person’s mental resources – task’s cognitive demands

People differ enormously in cognitive resources (2)
- Own ability
- Help from others

Tasks differ enormously in cognitive demands (3)
- Inherent complexity
- Needless complexity
Relative risk of cognitive overload & non-adherence

Risk is high when task demands (3) exceed a person’s cognitive resources (2) for mastering a DSM task.

<table>
<thead>
<tr>
<th>Demands (3)</th>
<th>Resources (2)</th>
<th>Lo</th>
<th>Hi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi</td>
<td>Lo</td>
<td>Lo risk</td>
<td></td>
</tr>
<tr>
<td>Lo</td>
<td></td>
<td>Hi risk</td>
<td></td>
</tr>
</tbody>
</table>

But
Both a person’s resources (2) and demands (3) can rise or fall.
DSMES aims to assess both.
DSMES aims to protect or increase (2) & limit or reduce (3).
Outline of topics

1. Cognitive accessibility of DSMES information and instruction: What is it?

2. Needless complexity in DSM tasks: Tools to identify and eliminate it

3. Inherent complexity in DSM tasks: Tools to identify and reduce it

4. Examples of reducing complexity in the AADE7™
Common tools for assessing health education materials

<table>
<thead>
<tr>
<th>Guides &amp; rating forms</th>
<th>Source</th>
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<tr>
<td>Readability (e.g., grade level)</td>
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<td>Flesch-Kincaid Grade Level</td>
<td>Available in MS Word</td>
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<tr>
<td></td>
<td></td>
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<td>Word choice</td>
<td></td>
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<tr>
<td>Everyday Language for Public Health Communication</td>
<td>CDC</td>
</tr>
<tr>
<td>Plain Language Word Suggestions</td>
<td>NIH</td>
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<td></td>
<td></td>
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<td>Understandability</td>
<td></td>
</tr>
<tr>
<td>Clear Communications Index</td>
<td>CDC</td>
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<tr>
<td>Patient Education Materials Assessment Tool (PEMAT)</td>
<td>AHRQ</td>
</tr>
<tr>
<td>Toolkit for Making Material Clear &amp; Effective</td>
<td>CMS</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Understandability, specifically to prevent patient errors</td>
<td></td>
</tr>
<tr>
<td>Improving Health Literacy to Protect Patient Safety</td>
<td>Joint Commission</td>
</tr>
<tr>
<td>Health Literacy Universal Precautions Toolkit</td>
<td>AHRQ</td>
</tr>
</tbody>
</table>
Readability formulas: Example

To be or not to be, that is the question.

Ingredients of readability:
ASW: Average syllables per word
ASL: Average words per sentence

\[ 206.835 - (84.6 \times ASW) - (1.015 \times ASL) \]

\[ (0.39 \times ASL) + (11.8 \times ASW) - 15.59 \]

• Measure only tiny fraction of what makes written material understandable
• Grade levels are misleading
• Suitable only for continuous prose
Plain Language mandated, 2010, for federal government

Some how’s

The why

Part of the NIH mission is to reach all Americans with health information they can use and to communicate in a way that helps people to easily understand research results.

“We’ll, yes, I suppose I could explain the test results in ‘plain English’ — but then you’d know how sick you are.”

Plain Language Act

President Barack Obama signed the Plain Writing Act of 2010 (H.R. 940/Public Law 111-274) on October 13, 2010.
For words:

- Use more common, less abstract words
- Use less wordy phrases

<table>
<thead>
<tr>
<th>INSTEAD OF</th>
<th>TRY</th>
<th>INSTEAD OF</th>
<th>TRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>a and/or b</td>
<td>a or b both</td>
<td>consolidate</td>
<td>combine, join, merge</td>
</tr>
<tr>
<td>accompany</td>
<td>go with</td>
<td>constitutes</td>
<td>is, forms, makes up</td>
</tr>
<tr>
<td>accomplish</td>
<td>carry out, do</td>
<td>contains</td>
<td>has</td>
</tr>
<tr>
<td>accorded</td>
<td>given</td>
<td>converse</td>
<td>meet</td>
</tr>
<tr>
<td>accordingly</td>
<td>so</td>
<td>currently</td>
<td>(omit), now</td>
</tr>
<tr>
<td>accrue</td>
<td>add, gain</td>
<td>deem</td>
<td>believe, consider, think</td>
</tr>
<tr>
<td>accurate</td>
<td>correct, exact, right</td>
<td>deceive</td>
<td>cut, drop</td>
</tr>
<tr>
<td>additional</td>
<td>added, more, other</td>
<td>demonstrate</td>
<td>prove, show</td>
</tr>
<tr>
<td>address</td>
<td>discuss</td>
<td>depart</td>
<td>leave</td>
</tr>
<tr>
<td>addresses</td>
<td>you</td>
<td>designate</td>
<td>appoint, choose, find</td>
</tr>
<tr>
<td>addresses are requested</td>
<td>(omit), please</td>
<td>desire</td>
<td>want, wish</td>
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<tr>
<td>adjacent to</td>
<td>next to</td>
<td>determine</td>
<td>decide, figure, find</td>
</tr>
<tr>
<td>advantages</td>
<td>high</td>
<td>determine</td>
<td>decide, figure, find</td>
</tr>
<tr>
<td>adversely impact on</td>
<td>hurt, set back</td>
<td>effect modifications</td>
<td>make changes</td>
</tr>
<tr>
<td>advise</td>
<td>recommend, tell</td>
<td>effect modifications</td>
<td>make changes</td>
</tr>
<tr>
<td>afford an opportunity</td>
<td>allow, let</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>aircraft</td>
<td>plane</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>allocate</td>
<td>divide</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>anticipate</td>
<td>expect</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<tr>
<td>a number of</td>
<td>some</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<tr>
<td>apparent</td>
<td>clear, plain</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>appreciable</td>
<td>many</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
</tr>
<tr>
<td>appropriate</td>
<td>(omit), proper, right</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>approximate</td>
<td>about</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>arrive aboard</td>
<td>arrive</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
</tr>
<tr>
<td>as a means of</td>
<td>to</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<tr>
<td>ascertain</td>
<td>find out, learn</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<tr>
<td>as prescribed by</td>
<td>in, under</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<tr>
<td>assist, assistance</td>
<td>aid, help</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>attain</td>
<td>meet</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>attempt</td>
<td>try</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>at the present time</td>
<td>at present, now</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>be advised</td>
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<td>benefit</td>
<td>help</td>
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<tr>
<td>by means of</td>
<td>by, with</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>near</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>combat environment</td>
<td>combat</td>
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<td>due to the fact that, due to, since</td>
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<tr>
<td>combined</td>
<td>joint</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<tr>
<td>commence</td>
<td>begin, start</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
</tr>
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<td>comply with</td>
<td>follow</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>component</td>
<td>part</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>compose</td>
<td>form, include, make up</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
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<td>about, on</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
</tr>
<tr>
<td>consequently</td>
<td>so</td>
<td>affect</td>
<td>due to the fact that, due to, since</td>
</tr>
</tbody>
</table>

Source: [http://www.plainlanguage.gov/howto/wordSuggestions/simpleWords.cfm](http://www.plainlanguage.gov/howto/wordSuggestions/simpleWords.cfm)
<table>
<thead>
<tr>
<th>Function</th>
<th>magnitude</th>
<th>size</th>
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<tbody>
<tr>
<td>furnish</td>
<td>maintain</td>
<td>keep, support</td>
</tr>
<tr>
<td>has a requirement for</td>
<td>maximum</td>
<td>greatest, largest, most</td>
</tr>
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<td>herein</td>
<td>methodology</td>
<td>method</td>
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<td>heretofore</td>
<td>minimize</td>
<td>decrease, method</td>
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<tr>
<td>herewith</td>
<td>minimum</td>
<td>least, smallest</td>
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<td>however</td>
<td>modify</td>
<td>change</td>
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<tr>
<td>identical</td>
<td>monitor</td>
<td>check, watch</td>
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<td>identity</td>
<td>necessitate</td>
<td>cause, need</td>
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<td>notify</td>
<td>let know, tell</td>
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<td>in an effort to</td>
<td>objective</td>
<td>aim, goal</td>
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<td>inasmuch as</td>
<td>obligate</td>
<td>bind, compel</td>
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<td>observe</td>
<td>see</td>
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<td>observe (omit)</td>
<td>operate</td>
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<tr>
<td>incumbent upon</td>
<td>operate</td>
<td>run, use, work</td>
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<td>indicate</td>
<td>optimum</td>
<td>best, greatest, most</td>
</tr>
<tr>
<td>indication</td>
<td>option</td>
<td>choice, way</td>
</tr>
<tr>
<td>initial</td>
<td>parameters</td>
<td>limits</td>
</tr>
<tr>
<td>initiate</td>
<td>participate</td>
<td>take part</td>
</tr>
<tr>
<td>in lieu of</td>
<td>perform</td>
<td>do</td>
</tr>
<tr>
<td>in order that</td>
<td>permit</td>
<td>let</td>
</tr>
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<td>in order to</td>
<td>pertaining to</td>
<td>about, of, on</td>
</tr>
<tr>
<td>in regard to</td>
<td>portion</td>
<td>part</td>
</tr>
<tr>
<td>in relation to</td>
<td>possess</td>
<td>have, own</td>
</tr>
<tr>
<td>inter alia</td>
<td>practicable</td>
<td>practical</td>
</tr>
<tr>
<td>interface</td>
<td>precise</td>
<td>prevent</td>
</tr>
<tr>
<td>interpose no objection</td>
<td>previous</td>
<td>earlier</td>
</tr>
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<td>in the amount of</td>
<td>previously</td>
<td>before</td>
</tr>
<tr>
<td>in the event of</td>
<td>priority</td>
<td>before</td>
</tr>
<tr>
<td>in the near future</td>
<td>prior to</td>
<td>before</td>
</tr>
<tr>
<td>in the process of</td>
<td>proceed</td>
<td>do, go ahead, try</td>
</tr>
<tr>
<td>in view of</td>
<td>procure</td>
<td>(omit)</td>
</tr>
<tr>
<td>in view of the above</td>
<td>proficiency</td>
<td>skill</td>
</tr>
<tr>
<td>is applicable to</td>
<td>promulgate</td>
<td>issue, publish</td>
</tr>
<tr>
<td>is authorized to</td>
<td>provide</td>
<td>give, offer, say</td>
</tr>
<tr>
<td>is in consonance with</td>
<td>provides</td>
<td>guidance for</td>
</tr>
<tr>
<td>is responsible for</td>
<td>guidance</td>
<td></td>
</tr>
<tr>
<td>it appears</td>
<td>purchase</td>
<td>buy</td>
</tr>
<tr>
<td>it is</td>
<td>provided</td>
<td>(omit)</td>
</tr>
<tr>
<td>it is essential</td>
<td>reflect</td>
<td>say, show</td>
</tr>
<tr>
<td>it is requested</td>
<td>regarding</td>
<td>(omit)</td>
</tr>
<tr>
<td>limited number</td>
<td>relate to</td>
<td>(omit)</td>
</tr>
<tr>
<td>limited number</td>
<td>relocate</td>
<td>(omit)</td>
</tr>
<tr>
<td>limited number</td>
<td>strict</td>
<td>(omit)</td>
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</table>

<table>
<thead>
<tr>
<th>Common Words</th>
<th>Plain Language Word Suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td>remain</td>
<td>stay</td>
</tr>
<tr>
<td>residual</td>
<td>next</td>
</tr>
<tr>
<td>remuneration</td>
<td>pay, payment</td>
</tr>
<tr>
<td>render</td>
<td>give, make</td>
</tr>
<tr>
<td>represents</td>
<td>is</td>
</tr>
<tr>
<td>request</td>
<td>ask</td>
</tr>
<tr>
<td>require</td>
<td>must, need</td>
</tr>
<tr>
<td>requirement</td>
<td>need</td>
</tr>
<tr>
<td>reside</td>
<td>live</td>
</tr>
<tr>
<td>retain</td>
<td>keep</td>
</tr>
<tr>
<td>said, some, each</td>
<td>the, this, that</td>
</tr>
<tr>
<td>section</td>
<td>choice</td>
</tr>
<tr>
<td>set forth in</td>
<td>in</td>
</tr>
<tr>
<td>similar to</td>
<td>like</td>
</tr>
<tr>
<td>solicit</td>
<td>ask for, request</td>
</tr>
<tr>
<td>state-of-the-art</td>
<td>latest</td>
</tr>
<tr>
<td>subject</td>
<td>the, this, your</td>
</tr>
<tr>
<td>submit</td>
<td>give, send</td>
</tr>
<tr>
<td>subsequent</td>
<td>later, next</td>
</tr>
<tr>
<td>subsequently</td>
<td>after, later, then</td>
</tr>
<tr>
<td>substantial</td>
<td>large, much</td>
</tr>
<tr>
<td>successfully complete</td>
<td>complete, pass</td>
</tr>
<tr>
<td>sufficient</td>
<td>enough</td>
</tr>
<tr>
<td>take action to</td>
<td>(omit)</td>
</tr>
<tr>
<td>terminate</td>
<td>end, stop</td>
</tr>
<tr>
<td>the month of</td>
<td>(omit)</td>
</tr>
<tr>
<td>there are</td>
<td>(omit)</td>
</tr>
<tr>
<td>therefore</td>
<td>so</td>
</tr>
<tr>
<td>thereon</td>
<td>there</td>
</tr>
<tr>
<td>thereof</td>
<td>(omit)</td>
</tr>
<tr>
<td>the undersigned</td>
<td>its, their</td>
</tr>
<tr>
<td>the use of</td>
<td>(omit)</td>
</tr>
<tr>
<td>this activity, command</td>
<td>us, we</td>
</tr>
<tr>
<td>timely</td>
<td>prompt</td>
</tr>
<tr>
<td>time period</td>
<td>(other one)</td>
</tr>
<tr>
<td>transmit</td>
<td>send</td>
</tr>
<tr>
<td>type</td>
<td>(omit)</td>
</tr>
<tr>
<td>under the provisions of</td>
<td>until, such time as, use</td>
</tr>
<tr>
<td>utilize, utilization</td>
<td>confirm</td>
</tr>
<tr>
<td>validate</td>
<td>practical, workable</td>
</tr>
<tr>
<td>viable</td>
<td>instead of, versus</td>
</tr>
<tr>
<td>slice</td>
<td>call for, permit</td>
</tr>
<tr>
<td>whereas</td>
<td>because, since</td>
</tr>
<tr>
<td>with the exception of</td>
<td>witnessed</td>
</tr>
<tr>
<td>your office</td>
<td>/ (slash)</td>
</tr>
</tbody>
</table>

Source: [http://www.plainlanguage.gov/howto/word suggestions/simplerwords.cfm](http://www.plainlanguage.gov/howto/word suggestions/simplerwords.cfm)
Substitutes for jargon

Understandability: Example from CDC

Anatomy of a Material

The following example illustrates how multiple index items work together to make a material easier to understand and use.

Main message is at the top of the page

Visual supports the text

Unfamiliar terms are explained

User headings and chunked text

### Understandability: Example from AHRQ

**UNDERSTANDABILITY**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item</th>
<th>Response Options</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The material makes its purpose completely evident.</td>
<td>Disagree=0, Agree=1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>The material does not include information or context that distracts from its purpose.</td>
<td>Disagree=0, Agree=1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The material uses common, everyday language.</td>
<td>Disagree=0, Agree=1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Medical terms are used only to familiarize audience with the terms. When used, medical terms are defined.</td>
<td>Disagree=0, Agree=1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>The material uses the active voice.</td>
<td>Disagree=0, Agree=1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Numbers appearing in the material are clear and easy to understand.</td>
<td>Disagree=0, Agree=1, No numbers=N/A</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>The material does not expect the user to perform calculations.</td>
<td>Disagree=0, Agree=1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>The material breaks or “chunks” information into short sections.</td>
<td>Disagree=0, Agree=1, Very short material=N/A</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>The material’s sections have informative headers.</td>
<td>Disagree=0, Agree=1, Very short material=N/A</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>The material presents information in a logical sequence.</td>
<td>Disagree=0, Agree=1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>The material provides a summary.</td>
<td>Disagree=0, Agree=1, Very short material=N/A</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>The material uses visual cues (e.g., arrows, boxes, bullets, bold, larger font, highlighting) to draw attention to key points.</td>
<td>Disagree=0, Agree=1, Video=N/A</td>
<td></td>
</tr>
</tbody>
</table>

**Topics**

- **Content**
- **Word Choice & Style**
- **Use of Numbers**
- **Organization**
- **Layout & Design**

---

Toolkit for Making Written Material Clear and Effective

Organization (sequencing, grouping, and labeling)

2.1 Group the information into meaningful “chunks” of reasonable size.
Readers can handle only a limited amount of information at one time. To avoid information overload, divide the text in ways that will make sense to the readers. Keep each segment or section of text relatively short. When you use bulleted lists, limit the number of bulleted points (group the points into sections if the list is long).

2.3 Use headings, subheadings, and other devices to signal what’s coming next.
These devices are “advance organizers” that show readers how the material is grouped and sequenced, and prepare them for the next topic.

Guidelines

Guidelines 2.1 to 2.5

Writing style

3.5 Create cohesion by making strong, logical connections among your sentences and paragraphs.
Develop ideas in a logical progression that makes the connections between ideas explicit. Repeat key words and phrases to reinforce learning and create continuity.

Guidelines 3.1 to 3.8

Headings, bulleted lists, and emphasizing blocks of text

7.1 To make the material easy to skim and show how it is organized, create a clear hierarchy of prominent headings and subheadings.
Left-justify the headings and subheadings, because readers sometimes miss headings that are centered. To emphasize how the material is structured, use contrast in fonts and maintain clear and consistent alignments, indentations, and spacing between headings and the text that follows.

Guidelines 7.1 to 7.4
8.2 Use of color

Use color sparingly, in a consistent and deliberate way that reinforces the meaning of your messages and enhances their impact.

Resist the impulse to use color in decorative ways that may distract people from the text. For greatest impact, use color with restraint, since using too much color creates “color overload” that can overwhelm and distract your readers. Be cautious about using color coding as a device. If you use color coding, do it in a consistent way and make the meaning clear to readers. Get feedback from readers to verify that they understand the color coding and find it helpful.

10.4 Tables, charts, and diagrams

If there are any numbers or calculations, explain them carefully and give examples.

Since math is hard for many people, and can be especially hard for people with low literacy skills, take special care with explanations that involve numbers. With calculations, use examples that show each step and explain it clearly. Simplify numeric examples by using rounded whole numbers as much as you can. To help people understand weights and measurements, make comparisons to familiar objects.

9.1 Photographs, illustrations, clip art, and symbols

Use photos, illustrations, symbols, and other visuals that relate directly to the information in the material and reinforce your key messages.

Images have great impact, so select them carefully and use them to highlight key points. Instead of using images to decorate the pages, choose images that reflect the subject matter of your materials. Try to show only the behaviors you want to encourage. Avoid using images that are too abstract or hard for readers to understand, such as parts of the body shown in isolation, cross-sections, and highly magnified images.

11.6 Forms and questionnaires

In a form for people with low literacy skills, avoid using a grid or matrix format to collect information.

A grid or matrix format has rows and columns. When you use a grid to collect information, readers have to keep looking up at the headings at the top of the columns to understand what you are asking for. To make it easier for people to give accurate answers, consider breaking each part of the grid into a fully labeled separate item.
<table>
<thead>
<tr>
<th>Time (breakfast)</th>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Sugar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time (lunch)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood Sugar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time (dinner)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood Sugar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time (bed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Blood Sugar</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Medicine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Some toolkits focus on educating to *prevent* dangerous patient errors

**Anticipate and prevent errors.**

- **Consider purchasing online reminder tools.** There are a number of commercially available tools that include features like:
  - Lists of patient medicines and simple explanations of what each medicine is for.
  - Audiovisual tutorials to help patients learn how to take their medicines.
  - Email or text messages to remind patients to take their medicines and to refill their prescriptions.
- **Always write prescriptions that include precise instructions for taking the medicine.** For example, instead of writing “twice daily” write, “Take 1 pill in the morning and 1 pill at bedtime.” Use the evidence-based instructions for taking pills, which can be installed in your EHR for eprescribing. The instructions are also available in Chinese, Korean, Russian, Spanish, and Vietnamese. Include a plain language description of what the prescription is for (e.g., “for high blood pressure”).
- **Warn patients about possible changes in the color, shape, and size of pills.** Make patients aware that color, shape, and size of pills may change when they refill prescriptions. Reassure them that, as long as the name of the medicine and the dose are the same as what they are used to taking, their medicine will work the same way and should be taken as originally directed.

Understandability: Example from Joint Commission

"What Did the Doctor Say?: Improving Health Literacy to Protect Patient Safety"

Tips for being reader centered

Orient your writing and design toward the subset of your readers who are less attentive, less knowledgeable, and less skilled at reading.

Your intended readers will differ in the attention they give to the material as well as the subject matter knowledge and literacy skills they bring to it. If you create written material that works well for those who are less attentive, less knowledgeable, and less skilled at reading, you will reach a larger proportion of your audience.
All these tools assess materials against the same basic principles of good writing

Good writing:

• Removes needless complexity and confusion

• Clears the cognitive path for readers to understand it.

• Builds a direct, well-lighted logical path to the main point, with no detours or distractions.

• Helps the reader understand by appreciating their needs.

• Takes practice and feedback.
CDC’s checklist covers many of those principles.

There’s a copy in the left pocket of your folder.
Insulin is a hormone that helps your body use the sugar (glucose) you get from the food you eat. Insulin levels rise and fall in response to the levels of glucose in your blood. Insulin’s main job is to help glucose get from your blood into the cells of your body, where it is used as fuel to keep the cells working normally.

The pancreas is the organ in your body that produces insulin throughout the day.

- When you have type 1 diabetes, you do not produce insulin.
- When you have type 2 diabetes, your body either does not produce enough insulin or your body’s cells do not respond to the insulin properly, called insulin resistance.

When you need to take insulin, there are different types. In some cases, you may use a mixture of different types, such as short-acting and long-acting insulin.

People with type 2 diabetes often need to add insulin to control their blood sugar when oral medications or non-insulin injectable medications (insulins and sulfonylureas) are not enough.

People with type 1 diabetes must use insulin injections to keep their blood sugar at a normal or close to normal level.

The number of insulin injections you take may vary from one day to using different types of insulin at different times of the day. When you first start taking insulin, your healthcare provider will decide on the type, amount, and frequency of the injections of insulin you need. This will be based on your lifestyle, blood sugar level, and any other diabetic medications you may be taking. Monitoring your diet along with your blood sugar levels will be important in deciding if any changes are needed in your insulin doses.

Remember that insulin injections will lower your blood sugar level, whether you have eaten or not. Very low blood sugars, known as hypoglycemia, can cause serious problems. Eating regular meals is very important when taking insulin.

Most people have no problem getting used to taking insulin injections. They feel better when their blood sugars are well controlled.

All people with diabetes need to help control their blood sugars by:
- Eating a healthy diet.
- Doing moderate exercise.
- Losing weight or maintaining a normal weight.
Using insulin to treat your diabetes: What it means for you

Insulin helps your body get energy from the food you eat. If you do not have enough insulin, or the insulin you have is not working right, you may have diabetes and need to take medicine.

- People with type 1 diabetes do not make any insulin and MUST inject insulin.
- People with type 2 diabetes do not make enough insulin or need help using the insulin they have. They need to use pills, insulin shots or both.

The only way to get insulin into your body is with a shot. Many people with diabetes use insulin shots. There are many kinds of insulin, some work fast, others do not.

You may need one shot of insulin a day, or you may need more. Your healthcare provider will explain what kind of insulin, the amount, and when you need it.

Your weight, diet and other medicines are important when deciding how much insulin you will need.

It is important to eat regular meals when you take insulin. Insulin shots help your blood sugar levels stay normal. If you take too much insulin or have not eaten, your blood sugar can drop too low. This is called "hypoglycemia."

Most people get used to using shots to take their insulin.

When you have diabetes it is important to:

- Eat a healthy diet
- Exercise
- Keep your weight down

These Starting Insulin fact sheets will help you learn more about insulin.
Using insulin: Version 1
Low literacy

Starting Insulin – a patient guide

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- Exercise
- Keep your weight down

These Starting Insulin fact sheets will help you learn more about insulin.
Injecting insulin: Version 1

**Injecting Insulin**

- Insulin needs to be given by a shot into the fat under the skin. The needles are very tiny and slide easily into the skin.
- The dots on this picture show where the insulin can be given.

**Be Careful:**
- Do not always inject in the same spot.
- Do not inject near your belly button.
- Do not inject near moles or scars.
- Do not inject in areas with a rash.

**Injecting Insulin:**
1. Wash and dry your hands.
2. Pick a clean, dry part of your body.
3. Make sure you are using the correct insulin.
4. If your insulin is cloudy, roll it gently between your hands to mix it. Do not shake it.
5. Take the cap off the insulin syringe. There are probably two caps, one for the plunger and one over the needle.
6. Pull the plunger to the number of units you use to fill it with air.
7. Put the needle in the insulin and push the air into the bottle.

**Using an insulin pen:**
1. Wash and dry your hands.
2. Pick a clean and dry site.
3. Turn the dial on your insulin pen to the number of units you need.
4. Some pens need to be "primed" first. Ask your healthcare provider about this.
5. Gently grab a fold of fatty skin between your fingers.
6. Push the needle into the skin and press down on the plunger.
7. Hold the pen in for 5 seconds.

*Your healthcare provider can help you learn how to inject insulin using a syringe or a pen.*
Injecting insulin: Version 2

INJECTING INSULIN

Insulin works best when injected into the fat just under the skin, not into the muscle.

Use the picture to see where to inject insulin.
- Each injection should be at least a finger-width away from your last injection.
- Injecting in the same spot causes hard bumps or fatty deposits and affects your body’s ability to absorb the insulin.

Insulin needles are thin and have a coating to make them slide into the skin. You can hardly feel them.

Do not inject insulin:
- Near moles or scars.
- In areas that look red, infected, or have a rash.
- Within 2 inches of the navel—do not injection.

Injecting insulin with a syringe
1. Wash and dry your hands.
2. Choose a clean and dry site.
3. Check the bottle to be sure you are using the right insulin.
4. If your insulin is cloudy, mix it by gently rolling the bottle between the palms of your hands 20 times. Do not shake insulin.
5. Remove the caps covering the plunger and the needle. Pull the plunger back, filling the empty syringe with air to the amount matching your insulin dose.

6. While the insulin bottle is steady on a tabletop, push the needle straight down into the rubber top, and then push down on the plunger.
7. Then turn the syringe and bottle upside down, keeping the point of the needle below the level of insulin in the bottle. Slowly pull back on the plunger to fill the syringe to the correct dosage.
8. Check for air bubbles in the syringe. Tap the syringe to move any air bubbles to the top. Carefully push the plunger to expel the air bubbles.
9. Check again that you have the right dose and the right type of insulin.
10. Remove the needle from the top of the insulin bottle and use it immediately.
11. Gently pinch a fold of skin between your thumb and forefinger.
12. Push the needle quickly, straight into the skin. Relax the pinch and push the plunger to inject the insulin. Pull the needle straight out.
13. Cover the injection site with your finger or a cotton ball or gauze. Apply slight pressure for 5-8 seconds, but do not rub the site.
14. Write down how much insulin you injected, the time of day, and site.

Injecting insulin with an insulin pen
1. Wash and dry your hands.
2. Choose a clean and dry site.
3. Turn the dial on your insulin pen to your dose of insulin.
4. Some pens need to be “primed” to get the air out of the syringe. Ask your healthcare provider to show you how to do this.
5. Gently pinch a fold of skin between your thumb and forefinger.
6. Push needle into the skin, and then relax the pinch.
7. Press down on the plunger to inject the insulin.
8. Hold the pen for skin for a count of 5 seconds.

Practice injections in front of your healthcare provider to help learn this skill.
Injecting insulin: Version 1
Very low literacy

INJECTING INSULIN

Insulin needs to be given by a shot into the fat under the skin. The needles are very thin and slide easily into the skin.

The dots on this picture show where the insulin can be given.

Be Careful:
- Do not always inject in the same spot.
- Do not inject near your belly button.
- Do not inject near moles or scars.
- Do not inject in areas with a rash.

Injecting Insulin:
1. Wash and dry your hands.
2. Pick a clean, dry part of your body.
3. Make sure you are using the correct insulin.
4. If your insulin is cloudy, roll it gently between your hands to mix it.
   Do not shake it.
5. Take the caps off the insulin syringe. There are probably two caps, one for the plunger and one over the needle.
6. Pull the plunger to the number of units you use to fill it with air.
7. Put the needle in the insulin and push the air into the bottle.
8. Pull out the number of units you need.
9. Look for air bubbles in the syringe. Tap the syringe to move air bubbles to the top and gently push them out with the plunger.
10. Use the insulin immediately.
11. Gently grab a fold of fatty skin between your fingers.
12. Push the needle into the skin and push the plunger to get the insulin into your body.
13. Wait a few seconds before you pull out the syringe.
14. Do not rub the area. Write down the amount of insulin you used, the time you gave it, and where you put it.

Using an insulin pen:
1. Wash and dry your hands.
2. Pick a clean and dry site.
3. Turn the dial on your insulin pen to the number of units you need.
4. Some pens need to be “primed” first. Ask your healthcare provider about this.
5. Gently grab a fold of fatty skin between your fingers.
6. Push the needle into the skin and press down on the plunger.
7. Hold the pen for 5 seconds.

Your healthcare provider can help you learn how to inject insulin using a syringe or a pen.
Injecting insulin: Version 2
Low literacy

Injecting insulin with a syringe

1. Wash and dry your hands.
2. Choose a clean and dry site.
3. Check the bottle to be sure you are using the right insulin.
4. If your insulin is cloudy, mix it by gently rolling the bottle between the palms of your hands, 10 times. Do not shake insulin.
5. Remove the caps covering the plunger and the needle. Pull the plunger back, filling the empty syringe with air to the amount matching your insulin dose.
6. While the insulin bottle is steady on a tabletop, push the needle straight down into the rubber top, and then push down on the plunger.
7. Turn the syringe and bottle upside down, keeping the point of the needle below the level of insulin in the bottle. Slowly pull back on the plunger to fill the syringe to the correct dosage.
8. Check for air bubbles in the syringe. Tap the syringe to move any air bubbles to the top. Carefully push the plunger to expel the air bubbles.
9. Check again that you have the right dose and the right type of insulin.
10. Remove the needle from the top of the insulin bottle and use it immediately.
11. Gently pinch a fold of skin between your thumb and forefinger.
12. Push the needle quickly, straight into the skin. Relax the pinch and push the plunger to inject the insulin. Pull the needle straight out.
13. Cover the injection site with your finger or a cotton ball or gauze. Apply slight pressure for 5-8 seconds, but do not rub the site.
14. Write down how much insulin you injected, the time of day, and site.

Practice injections in front of your healthcare provider to help learn this skill.
Activity

1. List all the actions required to inject insulin (choose either syringe or pen). *Answer on the handout.*

2. How would you educate a patient to complete this task?

3. Be sure to use action verbs & Plain Language.
List actions required to inject insulin

(E.g., look at the vial/pen to identify the name/type of insulin.)
Activity

1. List the actions required to read a food label and take meaningful action with the information. *Use the label and form provided in your handouts.*

2. Be sure to use action verbs and Plain Language.
# Nutrition Facts

**Serving Size**: 1 oz (28g/About 21 pieces)
**Servings Per Container**: About 2

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>Calories: 170</th>
<th>Calories from Fat: 110</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Fat</strong></td>
<td>11g</td>
<td>17%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>1.5g</td>
<td>8%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Cholesterol</strong></td>
<td>0mg</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>250mg</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total Carbohydrate</strong></td>
<td>14g</td>
<td>5%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>less than 1g</td>
<td>2%</td>
</tr>
<tr>
<td>Sugars</td>
<td>0g</td>
<td></td>
</tr>
<tr>
<td><strong>Protein</strong></td>
<td>2g</td>
<td></td>
</tr>
</tbody>
</table>

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

<table>
<thead>
<tr>
<th>Calories</th>
<th>2,000</th>
<th>2,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat</td>
<td>Less than 65g</td>
<td>Less than 80g</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>Less than 20g</td>
<td>Less than 25g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Less than 300mg</td>
<td>Less than 300mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>Less than 2,400mg</td>
<td>Less than 2,400mg</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>300g</td>
<td>375g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>25g</td>
<td>50g</td>
</tr>
</tbody>
</table>

Calories per gram:
- Fat: 9
- Carbohydrate: 4
- Protein: 4
List the actions required to use a nutrition label
(E.g., locate the serving size on the label)
Outline of topics

1. Cognitive accessibility of DSMES information and instruction: What is it?
2. Needless complexity in DSM tasks: Tools to identify and eliminate it
3. Inherent complexity in DSM tasks: Tools to identify and reduce it
4. Examples of reducing complexity in the AADE7™
Four decades of literacy research

1975

1987

1993

National literacy surveys

- Use written info to perform a task ("reading to do")
- Tasks simulate everyday activities with familiar materials
- Very large representative samples

2006
Surprising, common conclusion

Literacy is a general ability:
- “complex information processing skills”
- “verbal comprehension & reasoning”
- “ability to understand, analyze, evaluate”

It is not:
- not knowledge
- not content specific (words, numbers, etc)
- not modality specific (read, listen)
Here is a Social Security card. Sign your name on the line that reads "signature."

Sample tasks

What is the gross pay for this year to date?

You are a marketing manager for a small manufacturing firm. This graph shows your company’s sales over the last three years. Given the seasonal pattern shown on the graph, predict the sales for Spring 1985 (in thousands) by putting an "x" on the graph.

Pediatric Dosage Chart

Recommend

Drops, Syrup, & Chewables

<table>
<thead>
<tr>
<th>Age</th>
<th>Drops</th>
<th>Syrup</th>
<th>Chewables 90 mg</th>
<th>Chewables 30 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 3 mo</td>
<td>1 tsp</td>
<td>1 tsp</td>
<td>30 drops</td>
<td>10 drops</td>
</tr>
<tr>
<td>3 to 6 mo</td>
<td>1 tsp</td>
<td>1 tsp</td>
<td>30 drops</td>
<td>10 drops</td>
</tr>
<tr>
<td>6 to 12 mo</td>
<td>2 tsp</td>
<td>3 tsp</td>
<td>60 drops</td>
<td>20 drops</td>
</tr>
<tr>
<td>1 to 2 yr</td>
<td>2 tsp</td>
<td>3 tsp</td>
<td>60 drops</td>
<td>20 drops</td>
</tr>
<tr>
<td>2 to 3 yr</td>
<td>3 tsp</td>
<td>5 tsp</td>
<td>90 drops</td>
<td>30 drops</td>
</tr>
<tr>
<td>3 to 5 yr</td>
<td>5 tsp</td>
<td>10 tsp</td>
<td>150 drops</td>
<td>50 drops</td>
</tr>
<tr>
<td>5 to 7 yr</td>
<td>10 tsp</td>
<td>20 tsp</td>
<td>300 drops</td>
<td>100 drops</td>
</tr>
</tbody>
</table>

1 mL of solution contains 2 mg (2.5 mg per 5 mL) amoxicillin.

Dosage: Take 0.05 mL/kg body weight 3 times daily for 7 days.

Reported with permission.
## Typical literacy items, by difficulty level

### Daily self-maintenance in modern literate societies

<table>
<thead>
<tr>
<th>NALS difficulty level (&amp; scores)</th>
<th>% US adults peaking at this level</th>
<th>Simulated everyday tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prose</td>
<td>Docu</td>
</tr>
<tr>
<td>5 (375-500)</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 (325-375)</td>
<td>17%</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 (275-325)</td>
<td>32%</td>
<td>31%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (225-275)</td>
<td>27%</td>
<td>28%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (0-225)</td>
<td>21%</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Patients with lower literacy need more *cognitive support* to master the same task.

<table>
<thead>
<tr>
<th>NALS Literacy Level</th>
<th>Extra cognitive support required</th>
<th>% of US adult population (non-institutionalized)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (lowest)</td>
<td>Strong</td>
<td>23</td>
</tr>
<tr>
<td>2**</td>
<td>Moderate</td>
<td>28</td>
</tr>
<tr>
<td>3-5</td>
<td>Minimal</td>
<td>49</td>
</tr>
</tbody>
</table>


**Level 2 is usually the target population for “low-literacy” interventions.
What makes some items more difficult?

“Information processing complexity”
(National Adult Literacy Survey, 1993/2002)

<table>
<thead>
<tr>
<th>NALS difficulty level (scores)</th>
<th>Three scales, same results</th>
<th>Prose</th>
<th>Docu</th>
<th>Quant</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 (375-500)</td>
<td>3%</td>
<td>3%</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use calculator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use table of information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 (325-375)</td>
<td>17%</td>
<td>15%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use eligibility pamphlet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explain difference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 (275-325)</td>
<td>32%</td>
<td>31%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calculate miles per gallon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Write brief letter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (225-275)</td>
<td>27%</td>
<td>28%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Determine difference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Locate intersection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (0-225)</td>
<td>21%</td>
<td>23%</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total bank deposit entry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Locate expiration date</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Elements of “process complexity”

- number of features to match
- level of inference
- abstractness of info
- distracting information

Not reading per se, but “problem solving”

Readability doesn’t make a complex task easy

To be or not to be, that is the question.

Ingredients of readability:
- ASW: Average syllables per word
- ASL: Average words per sentence

\[
206.835 - (84.6 \times ASW) - (1.015 \times ASL)
\]

\[
(0.39 \times ASL) + (11.8 \times ASW) -15.59
\]
**Task #1—Underline sentence saying how often to give the medicine**

- **One piece of info**
- **Simple match**
- **But lots of irrelevant info**

---

**Pediatric Dosage Chart**

**Recommend**

**A Caring Sponsor of**

**Tempra**

**Ronald McDonald House**

**Ronald McDonald House is a program of**

**Ronald McDonald Children’s Charities**

---

**Pediatric Dosage Chart**

**Drops, Syrup, & Chewables**

<table>
<thead>
<tr>
<th>Age</th>
<th>Approximate Weight Range*</th>
<th>Drops</th>
<th>Syrup</th>
<th>Chewables 80 mg</th>
<th>Chewables 160 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>† Under 3 mo</td>
<td>Under 13 lb</td>
<td>½ dropper</td>
<td>¼ tsp</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>† 3 to 9 mo</td>
<td>13-20 lb</td>
<td>1 dropper</td>
<td>½ tsp</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>† 10 to 24 mo</td>
<td>21-26 lb</td>
<td>1 ½ droppers</td>
<td>¾ tsp</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>2 to 3 yr</td>
<td>27-35 lb</td>
<td>2 droppers</td>
<td>1 tsp</td>
<td>2 tablets</td>
<td>—</td>
</tr>
<tr>
<td>4 to 5 yr</td>
<td>36-43 lb</td>
<td>3 droppers</td>
<td>1½ tsp</td>
<td>3 tablets</td>
<td>1½ tablets</td>
</tr>
<tr>
<td>6 to 8 yr</td>
<td>44-62 lb</td>
<td>—</td>
<td>2 tsp</td>
<td>4 tablets</td>
<td>2 tablets</td>
</tr>
<tr>
<td>9 to 10 yr</td>
<td>63-79 lb</td>
<td>—</td>
<td>2½ tsp</td>
<td>5 tablets</td>
<td>2½ tablets</td>
</tr>
<tr>
<td>11 yr</td>
<td>80-89 lb</td>
<td>—</td>
<td>3 tsp</td>
<td>6 tablets</td>
<td>3 tablets</td>
</tr>
<tr>
<td>12 yr and older</td>
<td>90 lb &amp; over</td>
<td>—</td>
<td>3-4 tsp</td>
<td>6-8 tablets</td>
<td>3-4 tablets</td>
</tr>
</tbody>
</table>

---

*Dosage may be given every 4 hours as needed but not more than 5 times daily.*

**Note:**

- Drops: Each 0.8 ml dropper contains 80 mg (1.23 grains) acetaminophen.
- Syrup: Each 5 ml teaspoon contains 160 mg (2.46 grains) acetaminophen.
- Chewables: Regular tablets contain 80 mg (1.23 grains) acetaminophen each. Double strength tablets contain 160 mg (2.46 grains) acetaminophen each.

---

**Caution!**

Can train people to do this task, but not all possible tasks like it.
Task #1—Underline sentence saying how often to give the medicine

---

**Pediatric Dosage Chart**

<table>
<thead>
<tr>
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<th>Approximate Weight Range*</th>
<th>Drops</th>
<th>Syrup</th>
<th>Chewables 80 mg</th>
<th>Chewables 160 mg</th>
</tr>
</thead>
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<td>¼ tsp</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>† 3 to 9 mo</td>
<td>13-20 lb</td>
<td>1 dropper</td>
<td>½ tsp</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>† 10 to 24 mo</td>
<td>21-26 lb</td>
<td>1 ⅛ droppers</td>
<td>⅛ tsp</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>2 to 3 yr</td>
<td>27-35 lb</td>
<td>2 droppers</td>
<td>1 tsp</td>
<td>2 tablets</td>
<td>—</td>
</tr>
<tr>
<td>4 to 5 yr</td>
<td>36-43 lb</td>
<td>3 droppers</td>
<td>⅛ tsp</td>
<td>3 tablets</td>
<td>1 ⅓ tablets</td>
</tr>
<tr>
<td>6 to 8 yr</td>
<td>44-62 lb</td>
<td>—</td>
<td>2 tsp</td>
<td>4 tablets</td>
<td>2 tablets</td>
</tr>
<tr>
<td>9 to 10 yr</td>
<td>63-79 lb</td>
<td>—</td>
<td>2 ⅜ tsp</td>
<td>5 tablets</td>
<td>2 ⅓ tablets</td>
</tr>
<tr>
<td>11 yr</td>
<td>80-89 lb</td>
<td>—</td>
<td>3 tsp</td>
<td>6 tablets</td>
<td>3 tablets</td>
</tr>
<tr>
<td>12 yr and older</td>
<td>90 lb &amp; over</td>
<td>—</td>
<td>3-4 tsp</td>
<td>6-8 tablets</td>
<td>3-4 tablets</td>
</tr>
</tbody>
</table>

*Dosage may be given every 4 hours as needed but not more than 5 times daily.

---

- One piece of info
- Simple match
- But lots of irrelevant info

---

NALS levels

<table>
<thead>
<tr>
<th>NALS levels</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>LITERACY SCORES:</td>
<td>100</td>
<td>200</td>
<td>250</td>
<td>300</td>
<td>350</td>
</tr>
</tbody>
</table>

---

Mean = 272

---

#1 239
How difficult was item #1?

Error rate (%)
at mean score

Mean score: 200 250 300 350 400

Literacy level:

% adults peaking in this range: 23% 28% 31% 15% 3%

Mean score: 23% 28% 31% 15% 3%
#3—Your child is 11 years old and weighs 85 pounds. How many 80 mg tablets can you give in 24-hr period?
#3—Your child is 11 years old and weighs 85 pounds. How many 80 mg tablets can you give in 24-hr period?
How difficult was item #3?

Error rate (%)
at mean score

Literacy level:
Mean score:

% adults peaking in this range:

Mean score:

% adults peaking in this range:

NALS task level
(hardest)

23%
22%
31%
18%
3%
Complexity & aging

"Okay your father managed to get a mouse. Now how do we use it?"
Seniors are at much greater risk for low literacy

Error rate (%) at mean score

NALS task level (hardest)

Mean score: 200 250 300 350 400

% adults peaking in this range: 23% 28% 31% 15% 3%

% of 60+ year-olds: 47% 33% 16% 4% ~0%

Prevention is key. Prevention is a cognitive process.

How many hazards can you spot?

Figure 4.4. RoSPA hazard spotting picture

### Blood Glucose Log

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Blood Glucose Number</th>
<th>Other Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2/20</td>
<td>10:15</td>
<td>9.00</td>
<td></td>
</tr>
<tr>
<td>1/3/20</td>
<td>10:05</td>
<td>2.29</td>
<td></td>
</tr>
<tr>
<td>1/4/20</td>
<td>10:05</td>
<td>3.85</td>
<td></td>
</tr>
<tr>
<td>1/5/20</td>
<td>10:20</td>
<td>3.85</td>
<td></td>
</tr>
<tr>
<td>1/6/20</td>
<td>9:15</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>1/7/20</td>
<td>8:15</td>
<td>2.11</td>
<td></td>
</tr>
<tr>
<td>1/8/20</td>
<td>7:15</td>
<td>2.11</td>
<td></td>
</tr>
<tr>
<td>1/9/20</td>
<td>6:15</td>
<td>13.6</td>
<td></td>
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<tr>
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Matrix of cognitive risk for predicting patient errors

Greater cognitive ability (patients)

Heavier cognitive load (task complexity)

Error rates

% of tasks failed at this level:

% of population:

Greater cognitive ability (patients)

Probability of patient error (non-adherence)

Common critical DSM errors

Recall top 3 “precipitating factors”

1. Meal-related misadventure 46%
2. Unintentionally took wrong insulin product 22%
3. Unintentionally took wrong dose/confused units 12%
Common critical errors

Recall top 3 “precipitating factors”

1. Meal-related misadventure 46%
2. Unintentionally took wrong insulin product 22%
3. Unintentionally took wrong dose/confused units 12%

What went wrong?

Insights from “near misses”
1. Meal-related misadventures

• Took insulin, but
  • did not eat

• did not eat enough carbs (only a salad)
• did not count carbs

• counted carbs incorrectly—e.g., used weight grams rather than carb grams
2. Unintentionally took wrong insulin

• Used up “leftover” insulin

• Mixed up bottles for bolus and basal insulins

• Used bolus at times when should use basal insulin

• Failed to stop old insulin when changed to new one

Source for Case Studies: Diabetes In Control, “Diabetes Disasters Averted” www.diabetesincontrol.com
3. Unintentionally took wrong dose

- Split or chewed time release pills
- Based dose on wrong factor
- Administered dose improperly

"Do Not Crush, Chew or Cut"

In one case an elderly patient was prescribed Glucotrol XL to treat elevated blood sugars. This is a specially formulated medication that releases an entire day’s supply of the medication slowly over a 24-hour period. The pill was too large for the woman to swallow, so she chewed it. She soon complained of feeling dizzy, weak, listless, and lethargic. Chewing the drug caused it to be released all at once, causing dangerously low blood glucose levels, which could have been fatal.

Medication Safety Alert

A second patient also had mysteriously low blood glucose levels while using her pump. The pump has a bolus dosing “wizard” that allows patients to enter their blood glucose and the amount of carbohydrate grams they’ve eaten. However, the patient was entering the measured blood glucose into the carbohydrate field instead of the number of carbohydrates eaten. For example, 220 was entered in the carbohydrate field instead of 60 grams.

New FlexTouch Pens Not the Same as the Old

She was administering Levemir, 60 units, with a FlexPen. She said that she just dialed the dose to the maximum it would allow her as she knew it would only dial to 60 units. She did not confirm the dose visually.... I knew that her next refill would probably be the FlexTouch pen, which dials to 80 units. I reiterated the importance of a visual confirmation.

Source for Case Studies: Diabetes In Control, “Diabetes Disasters Averted” www.diabetesincontrol.com
Identifying sources of DSM error to improve patient adherence

- What was the patient’s error of omission or commission?
- What are the cognitive demands of the task(s)?
- Does the patient have any functional limitations that increase the risk of error?
- How can the misperformed task be simplified (e.g., fewer steps)?
- How would you use Bloom’s cognitive taxonomy of learning objectives to reduce the patient’s risk of making such errors?
Commonalities in patient errors

- Treated unlikes as interchangeable (e.g., different insulins)
- Did not grasp relevance of key distinctions
- Performed only one step of multi-step task
- Performed one or more steps incorrectly
- Did not coordinate timing of essential tasks
- Did not notice when things amiss
- Lacked basic skills and knowledge we often take for granted

Elemental cognitive errors
4-part strategy for cognitively accessible DSMES

1. Focus on patient’s biggest risks
2. Simplify task, if possible
3. Target instruction to ability level
4. Sequence learning objectives by complexity of cognitive processes

Adapt instruction to:

Patient X

How?

Patient’s cognitive ability

Task’s complexity

Patient’s cognitive ability

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78 113
Bloom’s Taxonomy of Cognitive Learning Objectives
(2001 revision)

Bloom’s levels are a continuum of cognitive complexity

Table 1. The cognitive processes dimension — categories, cognitive processes (and alternative names)

<table>
<thead>
<tr>
<th>Lower order thinking skills</th>
<th>Higher order thinking skills</th>
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<tbody>
<tr>
<td><strong>remember</strong></td>
<td><strong>create</strong></td>
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<tr>
<td>recognizing (identifying)</td>
<td>generating (hypothesizing)</td>
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<tr>
<td>recalling (retrieving)</td>
<td>planning (designing)</td>
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<tr>
<td>interpreting (clarifying, paraphrasing, representing, translating)</td>
<td>checking (coordinating, detecting, monitoring, testing)</td>
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<tr>
<td>exemplifying (illustrating, instantiating)</td>
<td>organizing (finding coherence, integrating, outlining, parsing, structuring)</td>
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<tr>
<td>classifying (categorizing, subsuming)</td>
<td>attributing (deconstructing)</td>
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<tr>
<td>summarizing (abstracting, generalizing)</td>
<td>(constructing)</td>
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<tr>
<td>inferring (concluding, extrapolating, interpolating, predicting)</td>
<td>(Table 1 adapted from Anderson and Krathwohl, 2001, pp. 67–86)</td>
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</table>
What makes learning tasks inherently more complex at higher Bloom levels?

### Instructional objectives differ in cognitive complexity

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<tr>
<th>lower order thinking skills</th>
<th>higher order thinking skills</th>
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<td>remember</td>
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<td>recognizing (identifying)</td>
<td>interpreting (clarifying, paraphrasing, representing, translating)</td>
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<tr>
<td>recalling (retrieving)</td>
<td>exemplifying (illustrating)</td>
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</table>

### Task elements that add to their inherent complexity (examples)*

- **Copy information**
  - Remember names, dates, places, concrete things

- **Locate information**
  - Explain an abstract (unseen) process

- **Code & compile information decisions**
  - Implement known ways to reduce risk

- **Combine information**
  - Weigh pros & cons

- **Memorize definitions, rules**
  - Illustrate a rule

- **Select best method, tool, or rule**

- **Compare & contrast methods, rules, procedures**
  - Identify patterns

- **Evaluate methods, tools, procedures**
  - Test hypotheses

### Task conditions that increase the difficulty—at all Bloom levels—of performing successfully

- Change, uncertainty, functional interdependence of tasks & processes, more to do at one time, need to block ingrained responses

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# Checklist for Assessing Cognitive Burdens in Learning and Doing Self-Care

Check all items that apply to your educational material or plan.

<table>
<thead>
<tr>
<th>Major Sources of Task Complexity</th>
<th>Inherent (Inescapable) Complexity</th>
<th>Increases Difficulty Beginning at This Bloom Level</th>
<th>Increases Difficulty at All Bloom Levels</th>
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<tbody>
<tr>
<td><strong>Needless Complexity</strong></td>
<td>Remember</td>
<td>Change</td>
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<tr>
<td>Written for wrong audience</td>
<td>Recall key facts</td>
<td>Circumstances change</td>
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<tr>
<td>Uses passive voice</td>
<td>Understand</td>
<td>Situation notes expected</td>
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<tr>
<td>Not concise, wordy</td>
<td>Recognize operation of unseen physical processes</td>
<td>Situation changing rapidly</td>
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<td>Awkward, confusing sentences</td>
<td>Explain timing &amp; sequencing of interdependent tasks</td>
<td>New &amp; evolving knowledge</td>
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<tr>
<td>Uses big words when simple one's will do</td>
<td>Correctly interpret specialized terms &amp; concepts</td>
<td>New opportunities</td>
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<tr>
<td>Uses abstract ideas when concrete ones OK</td>
<td>Identify relevant similarities and differences</td>
<td>New risks</td>
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<tr>
<td>Specialized terms not explained</td>
<td>Anticipate lag times</td>
<td>New rules</td>
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<td><strong>Abbreviations not explained</strong></td>
<td><strong>Uncertainty</strong></td>
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<td><strong>Numbers not explained</strong></td>
<td>Use familiar procedures in familiar situations</td>
<td>Amigulity</td>
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<td>Information not put in context</td>
<td>Calculate amounts</td>
<td>Novelty</td>
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<td><strong>Unc unnecessarily background info</strong></td>
<td>Select appropriate tool or procedure</td>
<td>Unpredictability</td>
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<td>Too much theory</td>
<td>Carry out all steps in a procedure</td>
<td>Inadequate information</td>
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<td>Visuals not used when would carry text</td>
<td>Respond quickly to unexpected problems</td>
<td>Inaccurate relation of means to ends</td>
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<td>Little or no &quot;to do&quot; advice</td>
<td>Coordinate interdependent tasks</td>
<td>Uninterv or unknown outcomes</td>
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<td>&quot;To do&quot; advice not specific</td>
<td>Make if-then decisions (use decision tree)</td>
<td>Frequent false alarms</td>
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<td><strong>Analyze</strong></td>
<td><strong>Functional interdependence</strong></td>
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<td>No way given to get more information</td>
<td>Adjust solutions to fit evolving problems</td>
<td>Processes interdependent</td>
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<td>Main point not clear at outset</td>
<td>Identify knowledge independently</td>
<td>Unintended effects (side effects)</td>
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<td>Little or no churning of ideas</td>
<td>Detect relationships &amp; patterns</td>
<td>More to do</td>
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<td>Chunking not logical or systematic</td>
<td>Weigh pros &amp; cons</td>
<td>More information to consider</td>
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<td>Content does not match headings</td>
<td>Integrate multiple sources of information</td>
<td>More tasks to coordinate</td>
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<td>Too few headings</td>
<td>Pick out most important information</td>
<td>Not adequate time to do them</td>
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<td>Headings not informative</td>
<td>Predict results of interdependent processes</td>
<td>Complex system to control</td>
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<td>Lists not bulleted</td>
<td>Evaluate (against an external standard)</td>
<td>Want to block improved response</td>
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<td><strong>Evaluate</strong></td>
<td><strong>Monitor results</strong></td>
<td>Outdated knowledge</td>
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<td>Identify problem situations quickly</td>
<td>Misconceptions</td>
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<td>Detect anomalies</td>
<td>Backheads</td>
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<td>Detect hazards</td>
<td>Expecting the usual in new situations</td>
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<td><strong>Create</strong></td>
<td>Spot signs and symptoms</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Eliminate needless burdens**
- **Teach basics before the more complex**
- **Anticipate errors**
DSM tasks differ in complexity

Bloom’s taxonomy of educational objectives (cognitive domain)*

**Simplest tasks**
1. **Remember**
   - recognize, recall, identify, retrieve
2. **Understand**
   - paraphrase, summarize, compare, predict, infer
3. **Apply**
   - execute familiar task, apply procedure to unfamiliar task
4. **Analyze**
   - distinguish, focus, select, integrate, coordinate
5. **Evaluate**
   - check, monitor, detect inconsistencies, judge effectiveness
6. **Create**
   - hypothesize, plan, invent, devise, design


© Stroh, K., & Gottfredson, L. S. Beyond health literacy: Cognitive demands of diabetes self-management. Full cite
**Bloom’s taxonomy of educational objectives (cognitive domain)**

**Simplest tasks**
1. Remember
   - recognize, recall, identify, retrieve

2. Understand
   - paraphrase, summarize, compare, predict, infer,

3. Apply
   - execute familiar task, apply procedure to unfamiliar task

4. Analyze
   - distinguish, focus, select, integrate, coordinate

5. Evaluate
   - check, monitor, detect inconsistencies, judge effectiveness

6. Create
   - hypothesize, plan, invent, devise, design

**Most complex tasks**

**DSM Goals**
- Keep BG under control
- Deal with unexpected events
- Prevent and/or manage complications

© Stroh, K., & Gottfredson, L. S. Beyond health literacy: Cognitive demands of diabetes self-management.
**Instructional strategy—minimize unnecessary cognitive load**

- Teach essential DSM tasks first, one at a time
- Sequence instruction from simple to complex ideas & skills
- Adjust speed and abstractness of instruction to accommodate individual’s learning needs
- **Never** assume that something is “simple” or obvious
- Confirm mastery before moving on
- Don’t squander individual’s cognitive resources by teaching non-essential skills and content, using too-complex materials, etc.

**Bloom’s taxonomy of educational objectives (cognitive domain)**

**Simplest tasks**

1. **Remember**
   - recognize, recall, identify, retrieve

2. **Understand**
   - paraphrase, summarize, compare, predict, infer

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   - execute familiar task, apply procedure to unfamiliar task

4. **Analyze**
   - distinguish, focus, select, integrate, coordinate

5. **Evaluate**
   - check, monitor, detect inconsistencies, judge effectiveness

6. **Create**
   - hypothesize, plan, invent, devise, design


© Stroh, K., & Gottfredson, L. S. Beyond health literacy: Cognitive demands of diabetes self-management.
What are we asking the patient to learn and do?
And how cognitively complex are these mental tasks?
What are we asking the patient to learn and do?

- Remember
  - Identify
  - Memorize
  - Recognize

- Understand
  - Classify
  - Interpret
  - Predict effects

- Apply
  - Calculate
  - Implement
  - Measure

- Analyze
  - Coordinate
  - Find pattern
  - Integrate

- Evaluate
  - Check
  - Detect problems
  - Judge effectiveness

- Create
  - Design
  - Hypothesize
  - Plan

Higher level thinking skills
### Checklist for assessing cognitive burdens in learning and doing self-care

Check all items that apply to your educational material or plan.

<table>
<thead>
<tr>
<th>Major sources of task complexity</th>
<th>Inherent (inescapable) complexity</th>
<th>Increases difficulty beginning at this Bloom level</th>
<th>Increases difficulty at all Bloom levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needsless complexity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor writing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written for wrong audience</td>
<td>Recall key facts</td>
<td>Circumstances change</td>
<td></td>
</tr>
<tr>
<td>Uses passive voice</td>
<td>Unintended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not concise, wordy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awkward, confusing sentences</td>
<td>Operation of unseen physical processes</td>
<td>Situation changing rapidly</td>
<td></td>
</tr>
<tr>
<td>Uses leg-ends when simple ones will do</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uses abstract ideas when concrete ones OK</td>
<td>New opportunities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialised terms not explained</td>
<td>New risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abbreviations not explained</td>
<td>Anticipate legal times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numbers not explained</td>
<td>New rules</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information not put in context</td>
<td>Anticipate legal times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor selection of information</td>
<td>Use familiar procedures in familiar situations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unnecessary background info</td>
<td>Calculate amounts</td>
<td>Anticipate legal times</td>
<td></td>
</tr>
<tr>
<td>Too much theory</td>
<td>Novelty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visuals not used when would clarify text</td>
<td>Inadequate information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visuals are irrelevant or confusing</td>
<td>Uncertain or unknown outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little or no &quot;to do&quot; advice</td>
<td>Frequent false alarms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analysis</td>
<td>Harm not visible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No way given to see more information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor organization of information</td>
<td>Adjust solutions to fit evolving problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main point not clear at outset</td>
<td>Update knowledge independently</td>
<td>Process interdependent</td>
<td></td>
</tr>
<tr>
<td>Little or no chunking of ideas</td>
<td>Identify potential causes</td>
<td>Tasks conflict (trade-offs)</td>
<td></td>
</tr>
<tr>
<td>Chunking not logical or systematic</td>
<td>Detect relationships &amp; patterns</td>
<td>Unintended effects (side effects)</td>
<td></td>
</tr>
<tr>
<td>Content does not match headings</td>
<td>Weigh pros &amp; cons</td>
<td>More tasks to coordinate</td>
<td></td>
</tr>
<tr>
<td>Too few headings</td>
<td>Predict results of interdependent processes</td>
<td>More information to consider</td>
<td></td>
</tr>
<tr>
<td>Headings not informative</td>
<td>Not adequate time to do them</td>
<td>Simple system to control</td>
<td></td>
</tr>
<tr>
<td>Items not bulleted</td>
<td>Not adequate time to do them</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New items against an external standard</td>
<td>Not adequate time to do them</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create</td>
<td>Monitor results</td>
<td>Outdated knowledge</td>
<td></td>
</tr>
<tr>
<td>Plan ahead</td>
<td>Identify problem situations quickly</td>
<td>Misconceptions</td>
<td></td>
</tr>
<tr>
<td>Create contingency plans</td>
<td>Detect anomalies</td>
<td>Bad habits</td>
<td></td>
</tr>
<tr>
<td>Combine Information to create something new</td>
<td>Detect hazards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop hypotheses to explain results</td>
<td>Expecting the usual in new situations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Eliminate needless burdens

- Teach basics before the more complex
- Anticipate errors
ASSESSMENT TOOL 5

Checklist for assessing patient's cognitive resources, help, & drains in learning and doing self-care tasks

Check all items that apply to this patient or group.

| Cognitive resources available to patient | Cognitive drains likely to interfere with patient
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>fully using available cognitive resources</td>
</tr>
<tr>
<td></td>
<td>Emotional</td>
</tr>
<tr>
<td></td>
<td>Physical</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Own cognitive ability level (under favorable conditions)</td>
<td>Emotional</td>
</tr>
<tr>
<td>Single Item Literacy Screen</td>
<td>Anger</td>
</tr>
<tr>
<td>“How often do you need to have someone help you when you read instructions, pamphlets, or other written material from your doctor or pharmacy?”</td>
<td>Anxiety</td>
</tr>
<tr>
<td></td>
<td>Depression</td>
</tr>
<tr>
<td></td>
<td>Family conflict</td>
</tr>
<tr>
<td></td>
<td>Fear</td>
</tr>
<tr>
<td></td>
<td>Frustration</td>
</tr>
<tr>
<td></td>
<td>Shame</td>
</tr>
<tr>
<td></td>
<td>Worry</td>
</tr>
<tr>
<td></td>
<td>Other (please specify)</td>
</tr>
<tr>
<td>Patient's response (check one)</td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td></td>
</tr>
<tr>
<td>Very low</td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td></td>
</tr>
<tr>
<td>Very high</td>
<td></td>
</tr>
<tr>
<td>Often</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td></td>
</tr>
<tr>
<td>Moderate to high</td>
<td></td>
</tr>
<tr>
<td>Risk of critical error</td>
<td></td>
</tr>
<tr>
<td>Minimal</td>
<td></td>
</tr>
<tr>
<td>Occasional</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive help from other people</td>
<td>Physical</td>
</tr>
<tr>
<td></td>
<td>Alcohol &amp; drugs</td>
</tr>
<tr>
<td>Family</td>
<td>Fatigue</td>
</tr>
<tr>
<td>Good</td>
<td>Hunger</td>
</tr>
<tr>
<td>Poor</td>
<td>Illness</td>
</tr>
<tr>
<td>None</td>
<td>Medication</td>
</tr>
<tr>
<td>Negative (confuse, burden, discourage, miinform, etc.)</td>
<td>Pain</td>
</tr>
<tr>
<td></td>
<td>Sleep deprived</td>
</tr>
<tr>
<td>Neighborhood &amp; friends</td>
<td>Other (please specify)</td>
</tr>
<tr>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>So-so</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Support groups</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Health care providers</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>So-so</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td></td>
</tr>
</tbody>
</table>
Outline of topics

1. Cognitive accessibility of DSMES information and instruction: What is it?
2. Needless complexity in DSM tasks: Tools to identify and eliminate it
3. Inherent complexity in DSM tasks: Tools to identify and reduce it
4. Examples of reducing complexity in the AADE7™
Group Activities
AADE7™ Self-Care Behaviors

Healthy Eating

Being Active

Monitoring

Taking Medication

Problem Solving

Reducing Risks

Healthy Coping
Educational status of DSME Participants:

- some college (17%)
- high school or GED degree (61%)
- some high school (13%)

(nearly identical to the proportions reported in 2012 (61%, 16%, 13%, respectively).
Table 1

Disciplines and CDE/BC-ADM Credentials of 2015 National Practice Survey Participants (in Percentages).

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Respondents</th>
<th>Has CDE Credential</th>
<th>Has BC-ADM Credential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse</td>
<td>50.3</td>
<td>87</td>
<td>4</td>
</tr>
<tr>
<td>Dietitian</td>
<td>35.1</td>
<td>91</td>
<td>2</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>6.1</td>
<td>73</td>
<td>11</td>
</tr>
<tr>
<td>Other</td>
<td>6.2</td>
<td>76</td>
<td>10</td>
</tr>
<tr>
<td>All</td>
<td>86</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: BC-ADM, Board Certified-Advanced Diabetes Management; CDE, Certified Diabetes Educator.
Figure 4. Resources used in diabetes self-management programs.
Figure 5. Comparison of reported behavioral strategy engagement in 2012 and 2015.
Healthy Eating
1. Meal-related misadventures

- Took insulin, but
  - did not eat
- did not eat enough carbs (only a salad)
- did not count carbs
- counted carbs incorrectly—e.g., used weight grams rather than carb grams

Source for Case Studies: Diabetes In Control, “Diabetes Disasters Averted” www.diabetesincontrol.com
Healthy Eating:

The Nutrition Label

Labels have different formats.

Does this increase or decrease complexity?
## Nutrition Facts

**Serving Size:** 1 cup (220g)  
**Servings Per Container:** 2

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>Calories</th>
<th>Calories from Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>250</td>
<td>110</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Daily Value*</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat</td>
<td>12g</td>
<td>18%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>3g</td>
<td>15%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>30mg</td>
<td>10%</td>
</tr>
<tr>
<td>Sodium</td>
<td>470mg</td>
<td>20%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>31g</td>
<td>10%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>0g</td>
<td>0%</td>
</tr>
<tr>
<td>Sugars</td>
<td>5g</td>
<td></td>
</tr>
</tbody>
</table>

### Protein
- 5g

### Vitamin A
- 4%

### Vitamin D
- 2%

### Calcium
- 20%

### Iron
- 4%

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

<table>
<thead>
<tr>
<th>Calories</th>
<th>Total Fat</th>
<th>Saturated Fat</th>
<th>Cholesterol</th>
<th>Sodium</th>
<th>Total Carbohydrate</th>
<th>Dietary Fiber</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,000</td>
<td>Less than 65g</td>
<td>Less than 20g</td>
<td>Less than 300mg</td>
<td>Less than 2,400mg</td>
<td>30g</td>
<td>25g</td>
</tr>
<tr>
<td>2,500</td>
<td>Less than 60g</td>
<td>Less than 25g</td>
<td>Less than 300mg</td>
<td>Less than 2,400mg</td>
<td>37g</td>
<td>30g</td>
</tr>
</tbody>
</table>
Cookie Dough

Nutrition Facts

Serv. Size: 1 3/4 oz (38g), Servings: 36

Amount Per Serving: Calories 170, Fat Cal. 80, Total Fat 9g (13%DV), Sat. Fat 3g (15%DV), Trans Fat 0g, Cholest. 15mg (5%DV), Sodium 135mg (6%DV), Total carb. 21g (7%DV), Fiber 1g (3%DV), Sugars 12g, Protein 3g, Vitamin A (0%DV), Vitamin C (0%DV), Calcium (0%DV), Iron (6%DV). Percent Daily Values (DV) are based on a 2,000 calorie diet.

granulated sugar, flour (wheat flour, malted barley flour, niacin, iron, thiamine mononitrate, riboflavin, folic acid), whole eggs, butter, vanilla, cinnamon, baking soda, salt. May contain traces of peanuts.

Peanut Butter: Flour (wheat flour, malted barley flour, niacin, iron, thiamine mononitrate, riboflavin, folic acid), peanut butter, granulated sugar, margarine (palm oil, water, soybean oil, salt, vegetable mono & diglycerides, soy lecithin, sodium benzoate (a preservative), citric acid, vanillin, natural flavor).
Information is better
• In chart form

But:
• Confusing technical symbol.
• Can you spot it?

### Nutrition Facts

<table>
<thead>
<tr>
<th>Serv. Size</th>
<th>Amount/serving</th>
<th>%DV*</th>
<th>Amount/serving</th>
<th>%DV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 croissant (57g)</td>
<td>Total Fat 8g</td>
<td>12%</td>
<td>Total Carb. 24g</td>
<td>8%</td>
</tr>
<tr>
<td>Serv. Per Cont. 144</td>
<td>Sat. Fat 3g</td>
<td>16%</td>
<td>Fiber 1g</td>
<td>3%</td>
</tr>
<tr>
<td>Calories</td>
<td>Trans Fat 1.5g</td>
<td>5%</td>
<td>Sugars 3g</td>
<td></td>
</tr>
<tr>
<td>Fat Cal. 70</td>
<td>Cholest. 10mg</td>
<td>4%</td>
<td>Protein 4g</td>
<td></td>
</tr>
<tr>
<td>Sodium 290mg</td>
<td>Vitamin A 4%</td>
<td>•</td>
<td>Vitamin C 2%</td>
<td>•</td>
</tr>
<tr>
<td>*Percent Daily Values (DV) are based on a 2,000 calorie diet.</td>
<td>Calcium 6%</td>
<td>•</td>
<td>Iron 8%</td>
<td>•</td>
</tr>
</tbody>
</table>

**INGREDIENTS:** Enriched Wheat Flour (Unbleached Wheat Flour, Malted Barley Flour, Niacin, Reduced Iron, Potassium Bromate, Thiamine Mononitrate, Riboflavin, Folic Acid), Water, Vegetable Shortening (Partially Hydrogenated Soybean and Cottonseed Oils, Soybean Oil, Soybean Lecithin with Mono- and Diglycerides, Vitamin A Palmitate), Butter, Sugar, Contains 2% or less of Leavening (Yeast, Baking Powder [Sodium Bicarbonate, Cornstarch, Sodium Aluminum Phosphate, Calcium Sulfate, Monocalcium Phosphate]), Non-Fat Dry Milk, Salt, Dough Conditioner (Wheat Flour, DATEM, Dextrose, Soybean Oil, Ascorbic Acid, L-Cysteine, Azodicarbonamide (ADA), Calcium Stearoyl-2-Lactylate, Enzymes), Eggs, Artificial Flavor, Preservatives (Calcium Propionate, Potassium Sorbate, Citric Acid).

**ALLERGY INFORMATION:**
CONTAINS: Eggs, Milk, Soy, Wheat
Pros:
- Fewer items
- Single vertical list
- Major headings stand out

Cons:
- Lots of irrelevant info
- Seemingly inconsistent info
# Nutrition Facts

Serving Size 1 oz. (28g/About 21 pieces)
Serving Per Container About 2

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>Calories 170</th>
<th>Calories from Fat 110</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Daily Value*</td>
<td>17%</td>
<td>8%</td>
</tr>
<tr>
<td>Total Fat 11g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturated Fat 1.5g</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Trans Fat 0g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol 0mg</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Sodium 250mg</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Total Carbohydrate 14g</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Dietary Fiber less than 1g</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Sugar 0g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein 2g</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Vitamin A 2% • Vitamin C 0%
Calcium 0% • Iron 4%
Vitamin E 6% • Thiamin 4%
Riboflavin 2% • Niacin 4%
Vitamin B6 2% • Phosphorus 2%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

<table>
<thead>
<tr>
<th>Calories per gram:</th>
<th>Fat 9 • Carbohydrate 4 • Protein 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories: 2,000</td>
<td>65g 8g 80g</td>
</tr>
<tr>
<td>Less than 65g</td>
<td>20g 8g</td>
</tr>
<tr>
<td>Total Fat</td>
<td>20g 20g</td>
</tr>
<tr>
<td>Less than 20g</td>
<td>2,000mg 2,000mg</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>300mg 300mg</td>
</tr>
<tr>
<td>Less than 300mg</td>
<td>2,400mg 2,400mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>2,000mg 2,000mg</td>
</tr>
<tr>
<td>Less than 2,000mg</td>
<td>375g 375g</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>55g 55g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>20g 20g</td>
</tr>
</tbody>
</table>

Current label
New label: What’s different?

Nutrition Facts
8 servings per container
Serving size 2/3 cup (55g)

Amount per serving
Calories 230
% Daily Value*
Total Fat 8g 10%
  Saturated Fat 1g 5%
  Trans Fat 0g
Cholesterol 0mg 0%
Sodium 160mg 7%
Total Carbohydrate 37g 13%
  Dietary Fiber 4g 14%
  Total Sugars 12g
  includes 10g Added Sugars 20%
Protein 3g

Vitamin D 2mcg 10%
Calcium 250mg 20%
Iron 8mg 45%
Potassium 225mg 6%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.
Does the new label **simplify** the information needed to control carbohydrates?
Bloom’s taxonomy of educational objectives (cognitive domain)

**Simplest tasks**
1. **Remember**
   - recognize, recall, identify, retrieve
2. **Understand**
   - paraphrase, summarize, compare, predict, infer,
3. **Apply**
   - execute familiar task, apply procedure to unfamiliar task
4. **Analyze**
   - distinguish, focus, select, integrate, coordinate
5. **Evaluate**
   - check, monitor, detect inconsistencies, judge effectiveness
6. **Create**
   - hypothesize, plan, invent, devise, design

**Most complex tasks**

- Location of relevant CHO gms
- Carb vs non-carb ??
- Sequence of label
- Total CHOs = imp; “Sugars” not = Total CHOs
- Volume vs wt
- How many CHO gms in 1 serving?
- Subtract fiber gms from CHO gms
- Distractors
  - CHO vs Fiber vs Fat
- Part of meal vs OK snack ?
- CHOs in intended serving ?
- CHO vs Fat/Chol vs Na
- Plan a meal or snack
Activity

• What actions are necessary, to use the label for carbohydrate information?

• How would you educate a patient to complete this task?

• Use action verbs, Plain Language, & Bloom’s taxonomy.
Bloom’s taxonomy of educational objectives (cognitive domain)

**Simplest tasks**

1. Remember, recognize, recall, identify, retrieve

2. Understand, paraphrase, summarize, compare, predict, infer

3. Apply, execute familiar task, apply procedure to unfamiliar task

4. Analyze, distinguish, focus, select, integrate, coordinate

5. Evaluate, check, monitor, detect inconsistencies, judge effectiveness

6. Create, hypothesize, plan, invent, devise, design

**Most complex tasks**
Using the food label, for patients with diabetes

(Look at the package/container and ............)
Using Bloom’s taxonomy to identify cognitive demands on nutrition labels

**Bloom’s taxonomy of educational objectives:**
cognitive domain
(Anderson & Krathwohl, 2001)

**Simplest tasks**
1. **Remember**
   - recognize, recall, identify, retrieve
2. **Understand**
   - paraphrase, summarize, compare, predict, infer,
3. **Apply**
   - execute familiar task, apply procedure to unfamiliar task
4. **Analyze**
   - distinguish, focus, select, integrate, coordinate
5. **Evaluate**
   - check, monitor, detect inconsistencies, judge effectiveness
6. **Create**
   - hypothesize, plan, invent, devise, design

**Most complex tasks**
- Locate “Serving size” on label
- Locate “Total CHO gms” on label
- Total CHO gms = relevant number
- “Sugars” gms ≠ total CHO gms
- Gms after “Serving Size” ≠ Total CHO gms
- % Daily Value CHO ≠ Total CHO gms
- Based on serving size, calculate number of “servings” to be consumed
- Calculate Total CHO gms in servings consumed (multiply number of intended servings by Total CHO gms in one serving)
- Analyze the amount of other nutrients to be limited (e.g., fat, sodium).
- Judge whether the intended serving contains too much e.g., fat, sodium.
- Plan a meal and or snack with recommended amount of CHOs.
- Coordinate CHO gms with non-labeled foods & drinks

### Nutrition Facts

<table>
<thead>
<tr>
<th>Serving Size</th>
<th>Calories per serving</th>
<th>Amount Per Serving</th>
<th>Calories from Fat</th>
<th>% Daily Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/3 cup (55g)</td>
<td>230</td>
<td>170</td>
<td>110</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Fat 11g</td>
<td>11g</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saturated Fat 1.5g</td>
<td>1.5g</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trans Fat 0g</td>
<td>0g</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cholesterol 0mg</td>
<td>0g</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sodium 250mg</td>
<td>250mg</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Carbohydrate 14g</td>
<td>14g</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dietary Fiber less than 1g</td>
<td>less than 1g</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sugars 0g</td>
<td>0g</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protein 2g</td>
<td>2g</td>
<td></td>
</tr>
</tbody>
</table>

- **Vitamin A** 2% • Vitamin C 0%
- **Calcium** 0% • Iron 4%
- **Vitamin E** 6% • Thiamin 4%
- **Riboflavin** 2% • Niacin 4%
- **Vitamin B6** 2% • Phosphorus 2%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

<table>
<thead>
<tr>
<th>Serving Size</th>
<th>Calories per serving</th>
<th>Amount Per Serving</th>
<th>Calories from Fat</th>
<th>% Daily Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 servings per container</td>
<td>55g</td>
<td>2/3 cup (55g)</td>
<td>230</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Serving size</td>
<td>1 oz (28g/About 21 pieces)</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Servings Per Container About 2</td>
<td></td>
<td>170</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amount Per Serving</td>
<td>Calories from Fat</td>
<td>% Daily Value*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calories</td>
<td>170</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Fat</td>
<td>11g</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saturated Fat</td>
<td>1.5g</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trans Fat</td>
<td>0g</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cholesterol</td>
<td>0mg</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sodium</td>
<td>250mg</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Carbohydrate</td>
<td>14g</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dietary Fiber</td>
<td>less than 1g</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sugars</td>
<td>0g</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protein</td>
<td>2g</td>
<td></td>
</tr>
</tbody>
</table>

- **Vitamin A** 2% • Vitamin C 0%
- **Calcium** 0% • Iron 4%
- **Vitamin E** 6% • Thiamin 4%
- **Riboflavin** 2% • Niacin 4%
- **Vitamin B6** 2% • Phosphorus 2%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
More Label Complexity
Labeling that diverts attention from most relevant facts
Labeling that diverts attention from most relevant facts
Grams vs. grams on label

Diabetes Disaster Averted #11: Label Literacy

I am a dietitian working as a diabetes educator. I often work with patients on insulin, and teach insulin to carb ratios and correction factors...

Patients need to be able to read food labels and know portion size in order to dose their medications properly. I often prefer patients who have had some education about food choices and carbs and I help them determine those ratios.

I was reviewing a patient’s food logs and insulin charts, and questioned the amount of carbohydrate he had stated for a particular food item, as it seemed high. I quickly found out the patient was actually looking at the weight of the food item in grams instead of looking at Total Carbohydrate grams on the food label.

The patient had erroneously calculated a higher insulin dose based on weight grams not carbs grams. Luckily, he experienced no hypoglycemia.

Now I make sure to point out to patients the difference in serving weight and Total Carbohydrates, and use only the value next to Total Carbohydrates (adjusting for serving size).

He has not been the only patient who gets confused by this.

Marilyn Baker, MS, RD, CDE

Take home message:

In addition to looking at weight grams patients often use the % of daily allowance as the amount of carbs they eat. And use the most experienced counter can make a big mistake. It is always good to remind your patients exactly what they should be looking for on the label each time you see them.

Diabetes Disaster Averted #60: Helping Patients Decipher Nutrition Labels

I had a patient who came in for instruction on carbohydrate counting in order to dose his insulin based on his carbohydrate intake. I instructed him on the use of food lists and food labels. When the patient returned for follow-up, his doses of insulin did not correlate with the amount of carbohydrate in some of his foods...

I asked him where he got the amount of carbohydrate in a particular food. I turned his eyes to the list of the food label (e.g., 50 grams), rather than the amount listed next to Total Carbohydrates (42 g). His blood sugars were still being elevated, so luckily he had not experienced any hypoglycemia. We again reviewed how to read a food label, and the patient was able to calculate the correct amount of carbohydrate.

Lesson learned:

Never assume a patient knows how to read a food label. Now I point out the difference between the weight in grams and the total carbs.

Marilyn Baker, MS, RD, CDE

Diabetes Disaster Averted series: [http://www.diabetesincontrol.com/articles/practicum](http://www.diabetesincontrol.com/articles/practicum)
Distracting, non-relevant information makes a task **more** complex.

_Eliminating_ non-relevant information makes a task **less** complex.
### Milk Label

#### Nutrition Facts

- **Serving Size**: 1 cup (236ml)
- **Servings Per Container**: 1

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>% Daily Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calories</strong></td>
<td>120</td>
</tr>
<tr>
<td><strong>Calories from Fat</strong></td>
<td>45</td>
</tr>
<tr>
<td><strong>Total Fat</strong></td>
<td>5g</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>3g</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
</tr>
<tr>
<td><strong>Cholesterol</strong></td>
<td>20mg</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>120mg</td>
</tr>
<tr>
<td><strong>Total Carbohydrate</strong></td>
<td>11g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>0g</td>
</tr>
<tr>
<td>Sugars</td>
<td>11g</td>
</tr>
<tr>
<td><strong>Protein</strong></td>
<td>9g</td>
</tr>
</tbody>
</table>

- **Vitamin A**: 10%  • **Vitamin C**: 4%
- **Calcium**: 30%  • **Iron**: 0%  • **Vitamin D**: 25%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.
### Nutrition Facts

<table>
<thead>
<tr>
<th>Amount/Serving</th>
<th>% DV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat</td>
<td>0g</td>
</tr>
<tr>
<td>Sodium</td>
<td>0mg</td>
</tr>
<tr>
<td>Total Carb.</td>
<td>1g</td>
</tr>
<tr>
<td>Sugars</td>
<td>0g</td>
</tr>
<tr>
<td>Sugar Alcohol</td>
<td>1g</td>
</tr>
<tr>
<td>Protein</td>
<td>0g</td>
</tr>
</tbody>
</table>

*Serving Size 1 piece (1.9g)  
Servings 14  
Calories <5  
*Percent Daily Values (DV) are based on a 2,000 calorie diet.  
*Percent Daily Values (DV) are based on a 2,000 calorie diet.

Not a significant source of other nutrients.

**INGREDIENTS:** SORBITOL, GUM BASE, GLYCERIN, MANNITOL, XYLITOL, NATURAL AND ARTIFICIAL FLAVORING; LESS THAN 2% OF: ACESULFAME POTASSIUM, ASPAR-TAME, BHT (TO MAINTAIN FRESHNESS), BLUE 1 LAKE, SOY LECITHIN AND YELLOW 5 LAKE. PHENYLKETONURICS: CONTAINS PHENYLALANINE; ALLERGY INFORMATION: CONTAINS SOY. 30% FEWER CALORIES THAN SUGARED GUM. CALORIE CONTENT OF THIS SIZE PIECE HAS BEEN REDUCED FROM 5 TO 3 1/2 CALORIES.
Sugar Free
Chocolate Chip

<table>
<thead>
<tr>
<th>Nutrition Facts</th>
<th>Amount/Serving</th>
<th>%DV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serv. Size</td>
<td>3 Cookies (32g)</td>
<td></td>
</tr>
<tr>
<td>Servings</td>
<td>About 5</td>
<td></td>
</tr>
<tr>
<td>Calories</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>Calories from Fat</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

*Percent Daily Values (DV) are based on a 2,000 calorie diet.

| INGREDIENTS: ENRICHED FLOUR (WHEAT FLOUR, NIAIN, REDUCED IRON, THIAMIN MONONITRATE [VITAMIN B1], RIBOFLAVIN [VITAMIN B2], FOLIC ACID), VEGETABLE OIL (SOYBEAN, PALM AND PALM KERNEL OIL WITH TBHQ FOR FRESHNESS), SUGAR FREE CHOCOLATE FLAVOURED CHIPS (MALTITOL, CHOCOLATE PROCESSED WITH ALKALI, COCOA BUTTER, SOY LEICHTIN, NATURAL FLAVOR), MALTITOL, LACTITOL, POLYDEXTROSE, MALTODEXTRIN, SORBITOL**, CONTAINS TWO PERCENT OR LESS OF SALT, NATURAL AND ARTIFICIAL FLAVOR, LEAVENING (BAKING SODA, SODIUM ACID PYROPHOSPHATE), EGG, SOY LEICHTIN, XANTHAN GUM, SODIUM STEAROYL LACTLYLATE, ACESULFAME POTASSIUM, CARAMEL COLOR, SUGAR ALCOHOL.

**EXCESS CONSUMPTION MAY HAVE A LAXATIVE EFFECT.

CONTAINS WHEAT, SOY, MILK AND EGG INGREDIENTS. MAY CONTAIN TRACES OF PEANUT AND TREE NUTS.

Sugar Free Cookies

**Shortbread**

<table>
<thead>
<tr>
<th>Nutrition Facts</th>
<th>Amount Per Serving</th>
<th>%DV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving Size</td>
<td>8 Cookies (30g)</td>
<td></td>
</tr>
<tr>
<td>Calories</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Calories from Fat</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

* Percent Daily Values (%DV) are based on a 2,000 calorie diet.

**INGREDIENTS:** ENRICHED FLOUR (WHEAT FLOUR, NIACIN, REDUCED IRON, VITAMIN B1 [THIAMIN MONONITRATE], VITAMIN B2 [RIBOFLAVIN], FOLIC ACID), SOYBEAN AND PALM OIL, SORBITOL*, MALTITOL, POLYDEXTRSE, MALTODEXTRIN, CONTAINS 2% OR LESS OF CAY FIBER, NATURAL AND ARTIFICIAL FLAVORS, SALT, LEAVENING (BAKING SODA, SODIUM ACID PYROPHOSPHATE, WHEY PROTEIN CONCENTRATE, DATEM, SOY LECITHIN, ANNATTO EXTRACT FOR COLOR), XANTHAN GUM, ACESULFAME POTASSIUM, SUCRALOSE.

*EXCESS CONSUMPTION MAY HAVE A LAXATIVE EFFECT.*

CONTAINS WHEAT, MILK AND SOY INGREDIENTS. MAY CONTAIN PEANUTS AND OTHER TREE NUTS.
• Patients constantly need to compare products, to manage carbohydrates.

• How does this increase the task complexity?
### Nutritional Information

<table>
<thead>
<tr>
<th>Nutritional Information</th>
<th>Serving Size: 1 oz</th>
<th>Servings Per Package: 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amount Per Serving:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calories 340</td>
<td></td>
<td>Calories from Fat 140</td>
</tr>
<tr>
<td>% Daily Value*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Fat 16</td>
<td>25.00 %</td>
<td></td>
</tr>
<tr>
<td>Saturated Fat 7</td>
<td>35.00 %</td>
<td></td>
</tr>
<tr>
<td>Cholesterol 25mg</td>
<td>8.00 %</td>
<td></td>
</tr>
<tr>
<td>Sodium 820mg</td>
<td>34.00 %</td>
<td></td>
</tr>
<tr>
<td>Total Carbohydrate 33g</td>
<td>11.00 %</td>
<td></td>
</tr>
<tr>
<td>Dietary Fiber 3g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugars 2g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein 15g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin A</td>
<td>0.00 %</td>
<td></td>
</tr>
<tr>
<td>Vitamin C</td>
<td>0.00 %</td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>30.00 %</td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>4.00 %</td>
<td></td>
</tr>
</tbody>
</table>

Not a significant source of Saturated Fat, Trans Fat, Cholesterol, Calcium or Iron.

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

<table>
<thead>
<tr>
<th>Calories: 2,000</th>
<th>Calories: 2,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat</td>
<td>Less Than 65g</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>Less Than 20g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Less Than 300mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>Less Than 2,400mg</td>
</tr>
<tr>
<td>Potassium</td>
<td>Less Than 3,500mg</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>300g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>25g</td>
</tr>
</tbody>
</table>

*Nutritional information is subject to change. Please see label of product on store shelves for the most current information.
### Nutritional Information

| Serving Size: 1 oz | Servings Per Container: 1 |

| Amount Per Serving: | | % Daily Value* |
|---------------------|--------------------------|
| Calories 250 | | |
| Calories from Fat 45 | | |
| % Daily Value | | |
| Total Fat (g) 5 | Cholesterol (mg) 40 | 13% |
| Saturated Fat (g) 2 | Sodium (mg) 590 | 25% |
| Trans Fat (g) 0 | Potassium (mg) 540 | 15% |
| Polyunsaturated Fat (g) 1 | Total Carbohydrate (g) 33 | 11% |
| Monounsaturated Fat (g) 1 | Dietary Fiber (g) 3 | 12% |
| Protein (g) 19 | Sugars (g) 6 | |

Diet Exchanges: 1 ½ Lean Meat 1 ½ Starch

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

<table>
<thead>
<tr>
<th>Calories:</th>
<th>2,000</th>
<th>2,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat</td>
<td>Less Than 65g</td>
<td>80g</td>
</tr>
<tr>
<td>Sat Fat</td>
<td>Less Than 20g</td>
<td>25g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Less Than 300mg</td>
<td>300mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>Less Than 2,400mg</td>
<td>2,400mg</td>
</tr>
<tr>
<td>Potassium</td>
<td>Less Than 3,500mg</td>
<td>3,500mg</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>300g</td>
<td>375g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>25g</td>
<td>30g</td>
</tr>
</tbody>
</table>

Nutritional information is subject to change. Please see label of product on store shelves for the most current information.

### Grilled Chicken Bake

#### Nutrition Facts

| Serving Size: 1 meal (369g) | Servings Per Container: 1 |

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>Calories 480</th>
<th>Calories from Fat 190</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Daily Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Fat 21g</td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td>Saturated Fat 8g</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Trans Fat 5g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol</td>
<td>60mg</td>
<td>20%</td>
</tr>
<tr>
<td>Sodium</td>
<td>900mg</td>
<td>38%</td>
</tr>
<tr>
<td>Potassium</td>
<td>450mg</td>
<td>13%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>45g</td>
<td>15%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>6g</td>
<td></td>
</tr>
<tr>
<td>Sugars</td>
<td>4g</td>
<td>24%</td>
</tr>
<tr>
<td>Protein</td>
<td>28g</td>
<td></td>
</tr>
</tbody>
</table>

Vitamin A 40% | Vitamin C 25%
Calcium 25% | Iron 10%
Riboflavin 20% | Niacin 15%
Folic Acid 20% | Vitamin B₁₂ 15%
Pantothenic Acid 20% | Phosphorus 40%
Magnesium 15% | Manganese 30%

Product formulations and packaging may change. For the most current information regarding a particular product, please refer to the product package.
Reading food labels

Can you find the facts on a food label? Whether you are counting “carbs” or finding fats, the Nutrition Facts panel helps you know just what you’re eating. Take a look at the label shown here and find the key facts.

Serving size
The first thing to check on a label is the serving size. All of the nutrition facts listed on the label, such as the calories, fat, and carbs, relate to this serving size. But look carefully! The serving size listed may not match the serving size you usually eat. So, for example, if the serving size for pasta is 1/2 cup and you are about to put 1 cup on your plate, you’ll need to triple the nutrition facts to match your serving size.

Total fat
It is recommended that less than 30% of your total calories for the day come from fat. Based on the number of calories you eat, the chart below shows how many grams of fat equals 30% of your total calories.

<table>
<thead>
<tr>
<th>Total daily calories</th>
<th>Total daily fat grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400</td>
<td>47</td>
</tr>
<tr>
<td>1600</td>
<td>53</td>
</tr>
<tr>
<td>2000</td>
<td>67</td>
</tr>
<tr>
<td>2400</td>
<td>80</td>
</tr>
</tbody>
</table>

When you look at the total fat listed on a food label, compare this to your fat limit for the day. Look at labels of similar foods to find the lowest fat choice. Foods labeled “low fat” have 3 g (grams) or less of fat per serving.

Nutrition Facts

<table>
<thead>
<tr>
<th>Serving Size</th>
<th>Calories per Container</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>Total Fat</td>
<td>1g</td>
<td>1%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>0g</td>
<td>0%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>0mg</td>
<td>0%</td>
</tr>
<tr>
<td>Sodium</td>
<td>250mg</td>
<td>10%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>18g</td>
<td>6%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>2g</td>
<td>9%</td>
</tr>
<tr>
<td>Sugar</td>
<td>0g</td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>5g</td>
<td></td>
</tr>
</tbody>
</table>

Total carbohydrate
The total carbohydrate is a total of all the starch, sugars, and fiber in a serving of food. You don’t need to single out sugar, just focus on the total carb number. One slice of bread has 15 grams of carbohydrate, or “1 carb choice.” Use this number to get a better sense of what the amount of total carbohydrate means on a label. On the sample label shown, 1/2 pita has 18 grams of total carbohydrate, which is equal to about 1 carb choice.

Fiber
Eating 20 to 35 grams of dietary fiber a day can be good for your health. When shopping for crackers, breads, or cereals, compare labels to find one that is higher in dietary fiber. A food is a good source of fiber if it has 2.5 grams or more of fiber in a serving.

What’s in a Word?

Here’s what common terms mean when used on a label:

**High**

A “high” food has 1/2 the calories or 1/2 the fat of the food to which it is being compared. For example, 1 tablespoon of light mayonnaise has 30 calories and 5 grams of fat, while 1 tablespoon of the real thing has 100 calories and 11 grams of fat.

**Low Calorie**

There still may be some calories in a serving of a “low calorie” food, but by law it has to be 40 calories or less.

**Sugar Free**

Something is labeled “sugar free” if it has only a half gram (0.5) of sugar or less per serving. Keep in mind, “sugar free” foods are not always low carbohydrate or low calorie foods. Read the label carefully.

-------------------
But recall that readability formulas do not include lists and tables.
Healthy Eating:

Planning Recommended Daily Menus
<table>
<thead>
<tr>
<th></th>
<th>1,200 Calories</th>
<th>1,600 Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breakfast</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole wheat bread</td>
<td>1 med slice</td>
<td>1 med slice</td>
</tr>
<tr>
<td>Jelly, regular</td>
<td>2 tsp</td>
<td>2 tsp</td>
</tr>
<tr>
<td>Cereal, shredded wheat</td>
<td>7/3 cup</td>
<td>1 cup</td>
</tr>
<tr>
<td>Milk, 1%</td>
<td>1 cup</td>
<td>1 cup</td>
</tr>
<tr>
<td>Orange juice</td>
<td>7/3 cup</td>
<td>1 cup</td>
</tr>
<tr>
<td>Coffee, regular</td>
<td>1 cup</td>
<td>1 cup with 1 oz of 1% milk</td>
</tr>
<tr>
<td><strong>Lunch</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roast beef sandwich:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole wheat bread</td>
<td>2 med slices</td>
<td>2 med slices</td>
</tr>
<tr>
<td>Lean roast beef, unseasoned</td>
<td>2 oz</td>
<td>2 oz</td>
</tr>
<tr>
<td>American cheese, low fat and low sodium</td>
<td>1 slice, 3/4 oz</td>
<td>1 slice, 3/4 oz</td>
</tr>
<tr>
<td>Lettuce</td>
<td>1 leaf</td>
<td>1 leaf</td>
</tr>
<tr>
<td>Tomato</td>
<td>3 med slices</td>
<td>3 med slices</td>
</tr>
<tr>
<td>Mayonnaise, low caloric</td>
<td>1 tsp</td>
<td>2 tsp</td>
</tr>
<tr>
<td>Apple</td>
<td>1 med</td>
<td>1 med</td>
</tr>
<tr>
<td>Water</td>
<td>1 cup</td>
<td>1 cup</td>
</tr>
<tr>
<td><strong>Dinner</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salmon</td>
<td>2 oz edible</td>
<td>3 oz edible</td>
</tr>
<tr>
<td>Vegetable oil</td>
<td>11/4 tsp</td>
<td>11/4 tsp</td>
</tr>
<tr>
<td>Baked potato</td>
<td>11/4 tsp</td>
<td>11/4 tsp</td>
</tr>
<tr>
<td>Margarine</td>
<td>11/4 tsp</td>
<td>11/4 tsp</td>
</tr>
<tr>
<td>Green beans, seasoned, with margarine</td>
<td>11/4 tsp</td>
<td>11/4 tsp</td>
</tr>
<tr>
<td>Carrots, seasoned</td>
<td>11/4 tsp</td>
<td>11/4 tsp</td>
</tr>
<tr>
<td>Carrots, seasoned, with margarine</td>
<td>11/4 tsp</td>
<td>11/4 tsp</td>
</tr>
<tr>
<td>White dinner roll</td>
<td>1 small</td>
<td>1 med</td>
</tr>
<tr>
<td>Ice milk</td>
<td>1 tsp</td>
<td>1 tsp</td>
</tr>
<tr>
<td>Iced tea, unsweetened</td>
<td>1 cup</td>
<td>1 cup</td>
</tr>
<tr>
<td>Water</td>
<td>2 cup</td>
<td>2 cup</td>
</tr>
<tr>
<td><strong>Snack</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Popcorn</td>
<td>21/4 tsp</td>
<td>21/4 tsp</td>
</tr>
<tr>
<td>Margarine</td>
<td>11/4 tsp</td>
<td>11/4 tsp</td>
</tr>
</tbody>
</table>

**Nutrition Facts:**

- Calories: 1,247 vs. 1,613
- Total Carbohydrate: 56 vs. 85
- % Calories: 26 vs. 29
- Total Fat: 7 vs. 8
- % Calories: 29 vs. 8
- Sodium: 1,043 vs. 1,341
- Total Cholesterol: 96 vs. 122
- Protein: 19 vs. 19

*Note: Calories have been rounded. No salt added in recipe preparation or as seasoning. All these reduced calorie levels, the amount of saturated fat is low and if the percent of calories from saturated fat is slightly over 7%.*
Healthy Eating:

*Multiple* Dietary Changes
# Drop Your Cholesterol With TLC

You get a lot of benefit from the TLC Program. Here are some estimates of how much you can lower your LDL cholesterol by following various steps in the program. The estimates are what is expected based on research. The more you do with the program, the lower your LDL will go. Further, even if you take a cholesterol-lowering medication, you will still benefit from the program—it will keep the dose down.

<table>
<thead>
<tr>
<th>Change</th>
<th>LDL Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturated fat</td>
<td>8–10%</td>
</tr>
<tr>
<td>Dietary cholesterol</td>
<td>3–5%</td>
</tr>
<tr>
<td>Weight</td>
<td>5–8%</td>
</tr>
<tr>
<td>Soluble fiber</td>
<td>3–5%</td>
</tr>
<tr>
<td>Plant sterol/standols</td>
<td>5–15%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20–30%</strong></td>
</tr>
</tbody>
</table>
NEW YORK (Reuters Health) - People with type 1 diabetes should account for the amount of fat in a meal, as well as its carbohydrate content, when calculating their insulin dose, according to new findings.

"Insulin dosing for food needs to be based not only on carbohydrate content, but on meal composition," Dr. Howard Wolpert of the Joslin Diabetes Center in Boston, an author of the study, told Reuters Health. "What it entails is a shift in the way we approach dosing for meals."

Adjustment is necessary when a meal contains at least 40 grams of fat, he added, and the adjusted dose should be spread out rather than given all at once because fat can slow gastric emptying.

Studies have shown that both fat and protein can cause postprandial hyperglycemia, Dr. Wolpert and his team note in their report, published online July 7 in Diabetes Care. But there is little data on how patients should adjust insulin to account for the amount of fat or protein in a meal, they add.

The researchers looked at differences in postprandial glycemia over a six-hour period when 10 adults with type 1 diabetes consumed a low-fat, low-protein meal (LFLP) and a high-fat, high-protein (HFHP) meal, both covered by the same insulin dose. The study participants later repeated the HFHP meal using an adaptive model-predictive bolus (MPB) of insulin. All patients were on an insulin pump.

When patients received the same insulin dose, the HFHP meal more than doubled glucose incremental area under the curve compared with the LFLP meal (27,092 vs. 13,320 mg/dL/min).

Adjusting the dose to achieve target glucose control with the HFHP meal required, on average, a 65% increase in insulin dose, although the additional amount varied widely among study participants, from 17% to 124%.

Most of the fat-related increase in glucose occurred 80 minutes after the meal.
Most of the fat-related increase in glucose occurred 80 minutes after the meal.

A major limitation of past research is that investigators have assumed that people would all need the same increase in insulin when eating a higher-fat meal, Dr. Wolpert noted.

"There's huge interindividual variation in the effect of fat on people's insulin requirement, so dosing requirements need to be individualized," he said.

Protein has less of an impact on post-meal glucose, according to Dr. Wolpert, and requires insulin dose adjustment only with meals containing at least 75 grams of protein.

Dr. Wolpert is currently working on developing smartphone-based tools to provide insulin dosing guidance based on a meal’s macronutrient content.


Diabetes Care 2016.
What kinds of approaches do you take with someone who is illiterate (Z55.0) and has DM?

For example, a lot of carb counting requires reading labels or using measuring cups. How do you best explain that?
Being Active
Physical activity:

Using a pedometer
Increasing Physical Activity by using a Pedometer.

The goal is to track your steps to increase by 10% each week during the month.

- Do you have an activity tracker or pedometer?
- Now could be a good time to purchase an inexpensive option OR if not, you can always download a FREE pedometer app and keep your cell phone in your pocket.
- At the end of each week during the month, your goal is:
  
  1. Increase steps by 10%
  OR
  2. Reach an average of 10,000 steps per day over the course of one week (TOTAL of 70,000 steps)

- How to track steps:
- Use a Pedometer, Activity Tracker, or Pedometer App on your phone to log steps at the end of each day
- Log TOTAL STEPS at the end of the week (if you reach at least 70,000 steps at the end of the week.
- Take your total steps and multiply by 1.1 (this increases that number by 10%)
- Your new goal for the next week is to INCREASE YOUR STEPS BY 10%
Example 2

Pedometer Challenge

1. Fill in the date and steps at the end of each day.
2. At the end of each week, calculate the average steps per day and multiply by 1.2 to determine what would be a 20% increase for the next week.
3. Check in with your nutritionist for tips and motivation.

Did you know there are approximately 10,000 steps in 5 miles?
Can you reach 10,000 steps by the end of 4 weeks?
The challenge is to try to beat last week’s steps by 20%!

Week 1:

<table>
<thead>
<tr>
<th>Date</th>
<th>Total Daily Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Weekly Total:
Divide by 7 =
Multiply by 1.2 =

This is your step goal per day for week #2
Example 3

<table>
<thead>
<tr>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Weekly TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11</td>
<td>12</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14</td>
<td>15</td>
<td>16</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>17</td>
<td>18</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>21</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23</td>
<td>24</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>26</td>
<td>27</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL STEPS:

Multiply by 1.1 =

TOTAL STEPS:

Multiply by 1.1 =

TOTAL STEPS:

Multiply by 1.1 =

TOTAL STEPS:

Multiply by 1.1 =

TOTAL STEPS:

Multiply by 1.1 =
**Rx for pedometer: front and back**

### Number of steps per day and per week:

<table>
<thead>
<tr>
<th>Week</th>
<th>Steps</th>
<th>Minutes</th>
<th>Days per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>1000</td>
<td>15</td>
<td>3-4</td>
</tr>
<tr>
<td>Week 2 &amp; 3</td>
<td>1500</td>
<td>15</td>
<td>3-4</td>
</tr>
<tr>
<td>After week 3</td>
<td>2000</td>
<td>20</td>
<td>3-4</td>
</tr>
</tbody>
</table>

**Rx for walking with pedometer**

**Handout**

“Pedometer log”
Teaching the teacher: Script for CDE when prescribing “Rx for Walking”

Provides the CDE with:

Educationally sound curriculum
- Key ideas
- Content, sequence, and pace of instruction, etc.

Implicit training
- Be concrete, personalize, use meaningful metaphors, etc.

<table>
<thead>
<tr>
<th>Key idea</th>
<th>Sample statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why</td>
<td><em>Exercise is important for staying healthy.</em></td>
</tr>
<tr>
<td>[general benefit]</td>
<td></td>
</tr>
<tr>
<td>[concrete example]</td>
<td><em>Walking helps keep your heart strong; it can help you lose weight; it also helps to relieve stress.</em></td>
</tr>
<tr>
<td>[personally]</td>
<td><em>Exercise is especially important for you because you have diabetes.</em></td>
</tr>
<tr>
<td>[meaningful metaphor]</td>
<td><em>For people with diabetes, exercise is as important as the medicines they take to control their blood sugar.</em></td>
</tr>
<tr>
<td>What</td>
<td><em>I am giving you a prescription for something that helps many people to start walking more.</em></td>
</tr>
<tr>
<td>[pull out Rx for walking]</td>
<td><em>It’s for a pedometer; it’s a little thing that you clip onto your belt/pants/skirt, and it counts many steps you take.</em></td>
</tr>
<tr>
<td>[basics of a pedometer]</td>
<td><em>This prescription tells you how many extra steps I want you to take.</em></td>
</tr>
<tr>
<td>[most crucial point to prescription]</td>
<td><em>The idea is to gradually increase how much walking you do each week, and how fast you do it.</em></td>
</tr>
<tr>
<td>[next most important point]</td>
<td><em>That way you can work up to getting the amount of exercise you need to control your diabetes, and have more energy for the things you like to do.</em></td>
</tr>
<tr>
<td>[specify end-goal]</td>
<td><em>The pedometer is a tool to help you do that in a way that works for you.</em></td>
</tr>
<tr>
<td>Where</td>
<td></td>
</tr>
<tr>
<td>[Tell patient where to take the prescription to get the pedometer.]</td>
<td><em>The [nurse, physician assistant/etc.] will give you the pedometer and show you how to use it.</em></td>
</tr>
<tr>
<td>[preview of session—reassurance that all will be explained]</td>
<td><em>[s/he will also help you think about different ways you might enjoy taking the extra steps I have prescribed for you.]</em></td>
</tr>
</tbody>
</table>

NOTE: Record “prescribed pedometer” in the patient’s chart
<table>
<thead>
<tr>
<th>Key Idea</th>
<th>Sample statements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Why</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>[general benefit]</td>
<td>“Exercise is important for staying healthy.”</td>
</tr>
<tr>
<td>[concrete example]</td>
<td>“Walking helps keep your heart strong; it can help you lose weight; it also helps to relieve stress.”</td>
</tr>
<tr>
<td>[personalize]</td>
<td>“Exercise is especially important for you because you have diabetes.”</td>
</tr>
<tr>
<td>[meaningful metaphor]</td>
<td>“For people with diabetes, exercise is as important as the medicines they take to control their blood sugar.”</td>
</tr>
<tr>
<td>[next most important point]</td>
<td>“The idea is to gradually increase how much walking you do each week, and how fast you do it.”</td>
</tr>
<tr>
<td>[specify end-goal]</td>
<td>“That way you can work up to getting the amount of exercise you need to control your diabetes, and have more energy for the things you like to do.”</td>
</tr>
<tr>
<td>[facilitate mindset that good health requires active self-care]</td>
<td>“The pedometer is a tool to help you do that in a way that works for you.”</td>
</tr>
<tr>
<td>[where]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>[tell patient where to take the prescription to get the pedometer]</td>
<td>“The [nurse, physician assistant/etc.] will give you the pedometer and show you how to use it.”</td>
</tr>
<tr>
<td>[prescribe a self-care mindset]</td>
<td>“She will also help you think about different ways you might enjoy taking the extra steps I have prescribed for you.”</td>
</tr>
</tbody>
</table>
### Key ideas to convey to patient when MD gives “Rx for walking”

<table>
<thead>
<tr>
<th>Key idea</th>
<th>Sample statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why</td>
<td>“Exercise is important for staying healthy.”</td>
</tr>
<tr>
<td></td>
<td>“Walking helps keep your heart strong; it can help you lose weight; it also helps to relieve stress.”</td>
</tr>
<tr>
<td></td>
<td>“Exercise is especially important for you because you have diabetes.”</td>
</tr>
<tr>
<td></td>
<td>“For people with diabetes, exercise is as important as the medicines they take to ...”</td>
</tr>
<tr>
<td>What</td>
<td>“I am giving you a prescription for something that helps many people to start walking more.”</td>
</tr>
<tr>
<td></td>
<td>“It’s for a pedometer. It’s a little thing that you clip onto your belt/pants/skirt, and it counts many steps you take.”</td>
</tr>
<tr>
<td></td>
<td>“This prescription tells you how many extra steps I want you to take.”</td>
</tr>
<tr>
<td></td>
<td>“The idea is to gradually increase how much walking you do each week, and how fast you do it.”</td>
</tr>
<tr>
<td></td>
<td>“That way you can work up to getting the amount of exercise you need to control your diabetes, and have more energy for the things you like to do.”</td>
</tr>
<tr>
<td></td>
<td>“The pedometer is a tool to help you do that in a way that works for you.”</td>
</tr>
</tbody>
</table>

NOTE: Record “prescribed pedometer” in the patient’s chart.
<table>
<thead>
<tr>
<th>Key Idea</th>
<th>Sample statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why</td>
<td>“Exercise is important for staying healthy.”</td>
</tr>
<tr>
<td>(general benefit)</td>
<td></td>
</tr>
<tr>
<td>(concrete example)</td>
<td>“Walking helps keep your heart strong; it can help you lose weight; it also helps to relieve stress.”</td>
</tr>
<tr>
<td>(personality)</td>
<td>“Exercise is especially important for you because you have diabetes.”</td>
</tr>
<tr>
<td>(meaningful metaphor)</td>
<td>“For people with diabetes, exercise is as important as the medicines they take to control their blood sugar.”</td>
</tr>
<tr>
<td>What</td>
<td></td>
</tr>
<tr>
<td>[pull out rx for walking]</td>
<td>“I am giving you a prescription for something that helps many people to start walking more.”</td>
</tr>
<tr>
<td>[sign &amp; enter patient's name]</td>
<td></td>
</tr>
<tr>
<td>(basics of a pedometer)</td>
<td>“It’s for a pedometer. It’s a little thing that you clip onto your belt/pants/skirt, and it counts many steps you take.”</td>
</tr>
<tr>
<td>[most crucial point in prescription]</td>
<td></td>
</tr>
<tr>
<td>[point to the contents of the rx]</td>
<td>“This prescription tells you how many extra steps I want you to take.”</td>
</tr>
<tr>
<td>[next most important point]</td>
<td></td>
</tr>
<tr>
<td>[specify end-goal]</td>
<td>“The idea is to gradually increase how much walking you do each week, and how fast you do it.”</td>
</tr>
<tr>
<td>Where</td>
<td></td>
</tr>
<tr>
<td>[Tell patient where to take the prescription to get the pedometer.]</td>
<td></td>
</tr>
<tr>
<td>[preview of session—reassurance that all will be explained]</td>
<td>“The [nurse, physician assistant/etc.] will give you the pedometer and show you how to use it.”</td>
</tr>
<tr>
<td>[reinforce active self-care mindset]</td>
<td>“S/he will also help you think about different ways you might enjoy taking the extra steps I have prescribed for you.”</td>
</tr>
</tbody>
</table>
Curriculum design: Don’t assume they know what’s obvious to you

Key ideas to convey to patient when clinic staff explain “Rx for walking”

Version: April 2020

<table>
<thead>
<tr>
<th>Key idea</th>
<th>Sample statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why?</td>
<td>“The aim is to get you walking more, because that will be good for you. Walking is like medicine, and it’s especially important for you.”</td>
</tr>
<tr>
<td>Concrete example of benefits</td>
<td>“For you in particular, it will help (cond. name benefits based on condition).”</td>
</tr>
<tr>
<td>[Patient M.O.S. evidence] most crucial point about the Rx prescribed</td>
<td>“As the doctor said, the prescription is for walking extra addition to what you already do.”</td>
</tr>
<tr>
<td>Patient’s current habits</td>
<td>“Tell me about the walking you do now. It can be any kind of example, when you are doing errands, at work, visiting friends.”</td>
</tr>
<tr>
<td>[Patient active self-care] measure</td>
<td>“This information is important, because I’d like to help you know kinds of extra walking would fit best into your life and be good for you.”</td>
</tr>
<tr>
<td>Also signal follow-up</td>
<td>“That might take some experimenting on your part, which you may do with follow-up in a few weeks.”</td>
</tr>
<tr>
<td>Over the Rx weeks</td>
<td>“Let’s talk now about how much extra walking the doctor prescribed. And how you plan to do it, instead of telling you how many steps to take and when to take them; it tells you how many minutes of extra walking you will do.”</td>
</tr>
<tr>
<td>[Week 1] week or two, you have to walk more steps during those 20-minute walks. This is to get you walking faster—and further.”</td>
<td>“People who take medicine for diabetes usually have to take it for the rest of their lives. If they want to stay healthy as possible. The same is true for getting exercise. It works only as long as you keep doing it. That’s why your prescription says to keep doing the extra walking even after you reach the fastest speed prescribed.”</td>
</tr>
</tbody>
</table>

Can’t assume that—

Patient will know:
- What a pedometer is
- How to wear it
- The exact regimen of the Rx

The CDE will know:
- Aim of script (e.g., extra steps)
- How to explain & adjust regimen
Graduated Rx

Basic Rx

**The Basic Rx (no increase over time)**

Amount per week:

___ steps in ___ minutes ___ days per week

Other instructions:

Patient’s signature

Provider’s signature

**Graduated Rx (gradual increase over time)**

Amount per week:

Week 1: ___ steps in ___ minutes ___ days per week

Week 2: ___ steps in ___ minutes ___ days per week

Week 3: ___ steps in ___ minutes ___ days per week

After Week 3: ___ steps in ___ minutes ___ days per week

Other instructions:

Patient’s signature

Provider’s signature

Increases speed
Monitoring
SMBG Accuracy
Patient behaviors & daily circumstances that reduce accuracy of BGM results

- Circumstances that can lower BGM accuracy
  - Environmental conditions (e.g., cold, high altitude)
  - Contaminants on the skin from food sources and lotions

- Less experience: BG results less accurate and precise when measured by patient rather than health professionals

- Under filling the test strip: Can introduce errors >20%

- Using alternate sites (sampling from palm, upper arm, forearm, thigh, or calf) can give inaccurate results, especially when glucose levels are changing rapidly.
  - After meals or exercise
  - When ill or under stress
  - Shortly after insulin administration

BGM = blood glucose monitor
Measuring blood sugar: Version 1

Testing your blood sugar often can help you control your diabetes.

Check your blood sugar regularly when:
- Taking diabetes pills or insulin
- Pregnant
- Blood sugar is hard to control
- Blood sugar results are low
- Blood sugar results are high and your urine has ketones
- Low blood sugar occurs without the usual warning signs
- Changing eating habits
- Taking certain medications, such as steroids or liquid medications

Check your blood sugar at different times during the day:
- Upon waking, before breakfast
- 2 hours after the start of a meal
- Before meals
- When you feel blood sugar is too high or too low

A glucometer is a machine that measures your blood sugar.

Choosing a glucometer
- Does your healthcare provider prefer a certain glucometer?
- What is the cost of the glucometer, batteries, and test strips?
- Which glucometers are covered by your insurance company?
- Is there a rebate toward the cost of the glucometer?
- Ease of use:
  - Some glucometers have more steps to follow than others.
  - Are the numbers easy to read?
  - Some glucometers allow you to stick your forearm, thigh, or fleshy part of your hand instead of your fingertip. Read the manufacturer’s instructions.
  - Is the glucometer easy to clean?
- How to make sure the glucometers is accurate:
  - Some glucometers have special coding or a computer chip that must be changed, or calibrated, with every new bottle of test strips.
  - Some glucometers have a “control” substance to check the machine.
  - Most glucometers are accurate and precise if used properly.

Glucometers may be a little different in how they are used. Here are some general steps:
- Wash your hands.
- Insert a test strip in your glucometer. This often turns the glucometer on, but some glucometers may have an on-off switch.
- Using a lancet, prick your fingertip. You may want to prick the side of your fingertip near the fingernail to avoid sensitivity on the end of your finger.
- Gently squeeze or massage your finger until a drop of blood forms.
- Touch and hold the edge of the test strip to the drop of blood.
- Often, your glucometer will “beep” when there is enough blood.
- Your blood sugar result will appear on the glucometer’s display.

Write down your blood sugar results each time you take them. Most glucometers come with log books, or you can use a notebook. Some glucometers can store blood sugar results. Be sure you have the date and time set and know how to use a glucometer with a memory. Show your record to your healthcare provider at every visit.

Poor meter readings result from:
- Dirty glucometer
- Glucometer or test strip that is not at room temperature
- Old or outdated test strips
- Glucometer that is not calibrated to the bottle of test strips used by that glucometer
- Too much or too little blood on the test strip

Your healthcare provider can help you understand how to use your glucometer.
Measuring Your Blood Sugar

Checking your blood sugar is important when you have diabetes.

Check your blood sugar when:
- Taking diabetes pills or insulin
- Pregnant
- Traveling
- Changing eating habits
- On new medicines
- Starting new exercise
- Sick

Your healthcare provider may tell you to check your blood sugar:
- When you wake up before you eat
- Before meals
- Two hours after you eat
- If you feel like your blood sugar is too high or too low

A glucometer is a machine that measures your blood sugar.

Choosing a glucometer:
- Ask your healthcare provider which glucometer is best for you.
- How much does the glucometer cost?
- How much do the batteries and test strips cost?
- Does your insurance pay for the glucometer and supplies?
- Is it easy to use?
- Are the numbers clear to read?
- Is it easy to clean?
- Is it easy to program?
  - Some glucometers have special coding or a computer chip that must be changed with every new bottle of test strips.
  - Some glucometers have a “control” substance to check the machine.

Measuring Your Blood Sugar

To use your glucometer:
1. Wash your hands
2. Put the test strip in your glucometer.
3. Using a sharp lancet, prick your fingertip.
4. Squeeze a small drop of blood out of your finger.
5. Touch the edge of the test strip to the blood.
6. Your machine might “beep” when there is enough blood.
7. Your results will show up on the glucometer.

Write down your blood sugar results and the time of day you tested in the glucometer log book or a notebook. Some glucometers can store blood sugar results. Be sure you have the date and time set and know how to use a glucometer with a memory.

Show your record to your healthcare provider at every visit.

Causes of incorrect results:
- Dirty glucometer
- Glucometer and test strip are not at room temperature
- Old or outdated test strips
- Glucometer that is not set to the bottle of test strips used by that glucometer
- Too much or too little blood on the test strip

Your healthcare provider can help you understand how to use your glucometer.
Measuring blood sugar: Version 1
Low literacy

Choosing a glucometer
- Does your healthcare provider prefer a certain glucometer?
- What is the cost of the glucometer, batteries, and test strips
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  - Gently squeeze or massage your finger until a drop of blood forms.
  - Touch and hold the edge of the test strip to the drop of blood.
  - Often your glucometer will "beep" when there is enough blood.
- Your blood sugar result will appear on the glucometer’s display.

Write down your blood sugar results each time you take them. Most glucometers come with log books, or you can use a notebook. Some glucometers can store blood sugar results. Be sure you have the date and time set and know how to use a glucometer with a memory. Show your record to your healthcare provider at every visit.

Poor meter readings result from:
- Dirty glucometer
- Glucometer or test strip that is not at room temperature
- Old or outdated test strips
- Glucometer that is not calibrated to the bottle of test strips used by that glucometer
- Too much or too little blood on the test strip.

Your healthcare provider can help you understand how to use your glucometer.
Measuring blood sugar: Version 2
Very low literacy

Checking your blood sugar is important when you have diabetes.

Check your blood sugar when:
- Taking diabetes pills or insulin
- Pregnant
- Traveling
- Changing eating habits
- On new medicines
- Starting new exercise
- Sick

Your healthcare provider may tell you to check your blood sugar:
- When you wake up before you eat
- Before meals
- Two hours after you eat
- If you feel like your blood sugar is too high or too low

A glucometer is a machine that measures your blood sugar.

Choosing a glucometer:
- Ask your healthcare provider which glucometer is best for you.
- How much does the glucometer cost?
- How much do the batteries and test strips cost?
- Does your insurance pay for the glucometer and supplies?
- Is it easy to use?
- Are the numbers clear to read?
- Is it easy to clean?
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- Old or outdated test strips
- Glucometer that is not set to the bottle of test strips used by
  that glucometer
- Too much or too little blood on the test strip

Your healthcare provider can help you understand how to use your glucometer.
Blood Glucose Logs
# Blood Glucose Log

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Blood Glucose Number</th>
<th>Other Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/29/15</td>
<td>10:15</td>
<td>8.10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Blood Glucose Number</th>
<th>Other Information</th>
</tr>
</thead>
</table>

**Recall**
<table>
<thead>
<tr>
<th>Fecha</th>
<th>Hora</th>
<th>Numero de glucom</th>
<th>Otra informacion</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-4</td>
<td>7:05</td>
<td>6152</td>
<td>108</td>
</tr>
<tr>
<td>2-4</td>
<td>7:11</td>
<td>6150</td>
<td>113</td>
</tr>
<tr>
<td>2-4</td>
<td>7:20</td>
<td>6150</td>
<td>113</td>
</tr>
<tr>
<td>2-4</td>
<td>7:26</td>
<td>6150</td>
<td>113</td>
</tr>
<tr>
<td>2-4</td>
<td>7:31</td>
<td>6150</td>
<td>113</td>
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<tr>
<td>2-4</td>
<td>7:39</td>
<td>6150</td>
<td>113</td>
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<tr>
<td>2-4</td>
<td>8:33</td>
<td>6150</td>
<td>113</td>
</tr>
<tr>
<td>2-4</td>
<td>9:27</td>
<td>6150</td>
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<tr>
<td>2-4</td>
<td>9:45</td>
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</tr>
<tr>
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<td>10:21</td>
<td>6150</td>
<td>113</td>
</tr>
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<td>10:49</td>
<td>6150</td>
<td>113</td>
</tr>
<tr>
<td>2-4</td>
<td>11:27</td>
<td>6150</td>
<td>113</td>
</tr>
<tr>
<td>2-4</td>
<td>11:55</td>
<td>6150</td>
<td>113</td>
</tr>
<tr>
<td>2-4</td>
<td>12:29</td>
<td>6150</td>
<td>113</td>
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<td>12:47</td>
<td>6150</td>
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<td>13:19</td>
<td>6150</td>
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<tr>
<td>2-4</td>
<td>13:49</td>
<td>6150</td>
<td>113</td>
</tr>
<tr>
<td>2-4</td>
<td>14:17</td>
<td>6150</td>
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<td>14:48</td>
<td>6150</td>
<td>113</td>
</tr>
<tr>
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<td>6150</td>
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<td>15:42</td>
<td>6150</td>
<td>113</td>
</tr>
<tr>
<td>2-4</td>
<td>16:08</td>
<td>6150</td>
<td>113</td>
</tr>
<tr>
<td>2-4</td>
<td>16:37</td>
<td>6150</td>
<td>113</td>
</tr>
</tbody>
</table>
## Blood glucose log: Example 1

### Blood Sugar Log for the Week of

<table>
<thead>
<tr>
<th></th>
<th>Breakfast</th>
<th>Lunch</th>
<th>Dinner</th>
<th>Bedtime</th>
<th>During the Night</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>blood sugar before</td>
<td>blood sugar after</td>
<td>blood sugar before</td>
<td>insulin</td>
<td>blood sugar after</td>
</tr>
<tr>
<td>Monday</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td></td>
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<td></td>
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<tr>
<td>Wednesday</td>
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<tr>
<td>Thursday</td>
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<td>Friday</td>
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<tr>
<td>Saturday</td>
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<tr>
<td>Sunday</td>
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</tbody>
</table>

### Weekly blood sugar notes

| Weekly blood sugar notes |
Blood glucose log: Example 2

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Blood Glucose</th>
<th>Other Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Blood glucose log: Example 3

<table>
<thead>
<tr>
<th>Date</th>
<th>Before Breakfast</th>
<th>2 hours after breakfast</th>
<th>Before lunch</th>
<th>2 hours after lunch</th>
<th>Before dinner</th>
<th>2 hour after dinner</th>
<th>Bedtime</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Paired testing: Why is it more complex?

<table>
<thead>
<tr>
<th>Day</th>
<th>Before breakfast</th>
<th>2 hours after breakfast</th>
<th>Before lunch</th>
<th>2 hours after lunch</th>
<th>Before dinner</th>
<th>2 hours after dinner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Wednesday</td>
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<td></td>
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<tr>
<td>Thursday</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Friday</td>
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<td></td>
<td>X</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Saturday</td>
<td></td>
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<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sunday</td>
<td>X</td>
<td>X</td>
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</tr>
</tbody>
</table>
What **actionable** information should a BG log or meter display contain?

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Anticipate effect of exercise & foods on blood glucose.
Coordinate meds, diet, and exercise.
Manage sick days.
Determine when & why blood glucose is out of control.
Monitor symptoms; assess whether action needed; evaluate effectiveness of actions.
Create daily and contingency plans that control blood glucose.

Recall effects of exercise on glucose.
Remember to take BGs & Rx.
Remember to measure foods, drinks & read labels.

Bloom's taxonomy of educational objectives (cognitive domain)*

Simplest tasks
1. Remember
   recognize, recall, identify, retrieve

2. Understand
   paraphrase, summarize, compare, predict, infer

3. Apply
   execute familiar task, apply procedure to unfamiliar task

4. Analyze
   distinguish, focus, select, integrate, coordinate

5. Evaluate
   check, monitor, detect inconsistencies, judge effectiveness

6. Create
   hypothesize, plan, invent, devise, design

Most complex tasks

Taking Medication
Taking Medication:

Assessing Cognitive Barriers to Adherence
Task #1—Underline sentence saying how often to give the medicine

Pediatric Dosage Chart

<table>
<thead>
<tr>
<th>Age</th>
<th>Approximate Weight Range</th>
<th>Drops</th>
<th>Syrup</th>
<th>Chewables 80 mg</th>
<th>Chewables 160 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>† Under 3 mo</td>
<td>Under 13 lb</td>
<td>½ dropper</td>
<td>½ tsp</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>† 3 to 9 mo</td>
<td>13-20 lb</td>
<td>1 dropper</td>
<td>½ tsp</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>† 10 to 24 mo</td>
<td>21-26 lb</td>
<td>1½ droppers</td>
<td>½ tsp</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>2 to 3 yr</td>
<td>27-35 lb</td>
<td>2 droppers</td>
<td>1 tsp</td>
<td>2 tablets</td>
<td>—</td>
</tr>
<tr>
<td>4 to 5 yr</td>
<td>36-43 lb</td>
<td>3 droppers</td>
<td>1½ tsp</td>
<td>3 tablets</td>
<td>1½ tablets</td>
</tr>
<tr>
<td>6 to 8 yr</td>
<td>44-62 lb</td>
<td>—</td>
<td>2 tsp</td>
<td>4 tablets</td>
<td>2 tablets</td>
</tr>
<tr>
<td>9 to 10 yr</td>
<td>63-79 lb</td>
<td>—</td>
<td>2½ tsp</td>
<td>5 tablets</td>
<td>2½ tablets</td>
</tr>
<tr>
<td>11 yr</td>
<td>80-89 lb</td>
<td>—</td>
<td>3 tsp</td>
<td>6 tablets</td>
<td>3 tablets</td>
</tr>
<tr>
<td>12 yr and older</td>
<td>90 lb &amp; over</td>
<td>—</td>
<td>3-4 tsp</td>
<td>6-8 tablets</td>
<td>3-4 tablets</td>
</tr>
</tbody>
</table>

Dosage may be given every 4 hours as needed but not more than 5 times daily.

* If ODM is significantly under or overweight, dosage must be adjusted accordingly.

Caution!
Can train people to do this task, but not all possible tasks like it.
“Don’t do” learning is critical but cognitively demanding
Hardest think to change may be an ingrained habit!

Recall

"Do Not Crush, Chew or Cut"

From the Institute for Safe Medication Practices (ISMP): When a patient is prescribed a timed release medication such as Glucotrol XL or Glucophage XR, clinicians need to ensure that the patients understand that they should not crush, chew or cut these pills. The medications must be swallowed whole.

In one case an elderly patient was prescribed Glucotrol XL to treat elevated blood sugars. This is a specially formulated medication that releases an entire day’s supply of the medication slowly over a 24-hour period. The pill was too large for the woman to swallow, so she chewed it. She soon complained of feeling dizzy, weak, listless, and lethargic. Chewing the drug caused it to be released all at once, causing dangerously low blood glucose levels, which could have been fatal....

Patients don’t need to take time-release pills so often, but must suppress any habit of crushing, chewing, or cutting pills.
But what if patient cannot swallow the whole pill?

Did this patient lack cognitive access to her DM treatment? If so, in what way? Be specific. (“Did not understand” is not sufficient!)

In hindsight, could the prescribing clinician have provided her better cognitive access? If so, specifically how? (“More” or “better” education is not sufficient!)

Woman, 67 years of age, newly diagnosed with type 2 diabetes with an A1C of 7.8%. Met with PCP who prescribed metformin ER and referred patient for diabetes education. Patient made some dietary and physical activity changes at first, but upon return visit her A1C was 8.5%. She reported she did not take the metformin. “I can’t swallow big pills. The bottle said not to crush or break the tablets. They were just too big to swallow. So then I just gave up on everything.”
Changing doses can be confusing

Complexity of task = opportunity for error

Patient must recognize that the change is adding a 2nd pill each day
Patient drew wrong inference about “changing”
Patient had “literal thinking”

DSMES

Clarify what was changed and what not
Give explicit instructions about what to remember
Do not assume that patient can infer new Rx schedule
Confirm instructions.

Diabetes Disaster Averted series: http://www.diabetesincontrol.com/articles/practicum
Lack of understanding often mistaken as lack of information or motivation

But literacy is more than decoding text (reading). It is a general ability to understand & use the information it contains.

People tend to “forget” what they do not understand.

Patient may not grasp how treatment works
More complexity = less understanding = less adherence

Section 2. Barriers to Medication Adherence

Patients face a multitude of barriers to taking their medication. Poor medication adherence is often viewed as the patient’s problem but it is also important to recognize the role we, as health care professionals, play in supporting poor medication-taking behaviors. Poor medication adherence can be frustrating for both the health care professional and the patient. Furthermore, evidence supports the notion that adherence decreases as the number of barriers for the patient and provider increases.

Patient-related Barriers
- Complexity of medication regimen
- High out-of-pocket cost
- Concern or risk of side effects
- Receives contradictory information from healthcare providers
- Belief system that is inconsistent with contemporary medicine

Prescriber-related Barriers
- Limited time with the patient
- Uncomfortable speaking to patients about adherence
- Lack of incentive to spend additional time counseling on adherence
- Unaware of lower-cost medications

Pharmacist-related Barriers
- Difficulties communicating with prescriber
- Limited time to review medication refill histories
- Inability to access refill history across multiple pharmacies
- Limited access to patient’s medical records in the ambulatory setting
Cumulative impact of cognitive burdens & barriers on adherence
<table>
<thead>
<tr>
<th>Method</th>
<th>Inexpensive</th>
<th>Actual medication taking not recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescription Claims Data</td>
<td>Non-invasive</td>
<td>Limited to patients who use one pharmacy</td>
</tr>
<tr>
<td>Provides refil frequency over a specified period</td>
<td>Inexpensive</td>
<td>Actual medication taking not recorded</td>
</tr>
<tr>
<td>Electronic Pill Bottle</td>
<td>Non-invasive</td>
<td>Expensive</td>
</tr>
<tr>
<td>Records occurrence and time bottle was opened</td>
<td>Expensive</td>
<td>Not practical for most patients</td>
</tr>
<tr>
<td>Provides information on patterns of medication taking</td>
<td>Inexpensive</td>
<td>Does not ensure medication was taken</td>
</tr>
</tbody>
</table>

**Subjective**

<table>
<thead>
<tr>
<th>Method</th>
<th>Accurate</th>
<th>Patient provides false information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief Medication Questionnaire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-reporting tool used to identify patterns at risk of non-adherence*</td>
<td>Validated in wide range of disease states</td>
<td></td>
</tr>
<tr>
<td>Available at: <a href="http://www.uhn.to/pq">http://www.uhn.to/pq</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brief Illness Perception Questionnaire</td>
<td>Time consuming</td>
<td></td>
</tr>
<tr>
<td>Assesses cognitive and emotional representations of illness</td>
<td>Good test retest reliability</td>
<td></td>
</tr>
<tr>
<td>Available at: <a href="http://www.vponsiblemedicalcentre.com/tools">http://www.vponsiblemedicalcentre.com/tools</a></td>
<td>Inexpensive</td>
<td></td>
</tr>
<tr>
<td>Medication Adherence Rating Scale</td>
<td>Only identifies one barrier (forgetfulness)</td>
<td></td>
</tr>
<tr>
<td>Determines patient willingness and ability to take essential medications daily</td>
<td>Brief, easy to use</td>
<td></td>
</tr>
<tr>
<td>Available at: <a href="http://www.virtualmedicalcentre.com/tools">http://www.virtualmedicalcentre.com/tools</a></td>
<td>Inexpensive</td>
<td></td>
</tr>
<tr>
<td>Also available on iTunes</td>
<td>More sensitive</td>
<td></td>
</tr>
<tr>
<td>Merklin Medication Adherence Scale</td>
<td>Patient provides false information</td>
<td></td>
</tr>
<tr>
<td>Measures medication taking behavior</td>
<td>Brief, easy to use</td>
<td></td>
</tr>
<tr>
<td>Available at: <a href="http://www.lernlieb.com/2003/00/allissues.pdf">http://www.lernlieb.com/2003/00/allissues.pdf</a></td>
<td>Inexpensive</td>
<td></td>
</tr>
<tr>
<td>Medication Adherence Individual Review Screening Tool – MedAdhIn ST</td>
<td>Patient provides false information</td>
<td></td>
</tr>
<tr>
<td>Tool to identify and assess adherence among elderly patients*</td>
<td>Brief, easy to use</td>
<td></td>
</tr>
<tr>
<td>Available on iTunes</td>
<td>Free</td>
<td></td>
</tr>
<tr>
<td>Clinician’s Toolkit: A Guide to Medication and Lifestyle Adherence</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Improve patient understanding by understanding (and adapting to) the patient

<table>
<thead>
<tr>
<th>Section 6. Interventions to Improve Adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S</strong> Simplify the regimen</td>
</tr>
<tr>
<td>• Adjust timing, frequency, and dosage</td>
</tr>
<tr>
<td>• Utilize once-daily medications whenever possible</td>
</tr>
<tr>
<td>• Encourage the use of adherence aids (e.g., pillboxes, cell phone alarms)</td>
</tr>
<tr>
<td>• Consider each patient’s activities of daily living (e.g., swing shift workers)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>M</strong> Modify patient beliefs and human behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ask patient about their needs and what might help them adhere to therapy</td>
</tr>
<tr>
<td>• Ensure patient understands consequences of non-adherence</td>
</tr>
<tr>
<td>• Addressed perceived barriers of taking the medication</td>
</tr>
<tr>
<td>• Provide rewards for adherence (e.g., praise, coupons, fewer clinic visits)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>P</strong> Provide communication and trust</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Practice to improve interviewing skills</td>
</tr>
<tr>
<td>• Embrace active listening and provide emotional support</td>
</tr>
<tr>
<td>• Elicit patient’s input when discussing treatment options</td>
</tr>
<tr>
<td>• Allow adequate time for the interaction and encourage patient to ask questions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>L</strong> Leave the bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Foster a greater understanding of health literacy and how it affects patients</td>
</tr>
<tr>
<td>• Ensure communication style is patient centered</td>
</tr>
<tr>
<td>• Take extra time to understand and overcome cultural barriers</td>
</tr>
<tr>
<td>• Tailor education to the patient’s level of understanding</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>E</strong> Evaluating adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ask patients simply and directly about adherence</td>
</tr>
<tr>
<td>• Engage patients about adherence at every encounter</td>
</tr>
<tr>
<td>• Measure drug levels or efficacy parameters, when applicable</td>
</tr>
<tr>
<td>• Review medication containers, noting last fill date and remaining medicine</td>
</tr>
</tbody>
</table>

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1681370/
Using syringes: Version 1

**INSULIN SYRINGES AND PENS**

**Starting Insulin – a patient guide**

**Insulin is injected in the fat just under the skin, using:**
- Syringes
- Insulin pens
- Insulin pumps

The most common way to inject insulin is with a **syringe**.
- A syringe is a hollow plastic tube with a plunger inside and a short skinny needle attached.
- Insulin is injected into the fatty tissue just under the skin. This is called a subcutaneous tissue, or “sub-Q” injection.

**Syringes come in different sizes.**
- Each line on a 100-unit syringe marks 2 units of insulin.
- Each line on a 50-unit or 30-unit syringe marks 1 unit of insulin.
- Use a syringe large enough to hold the whole dose of insulin.

**Starting Insulin – a patient guide**

**INSULIN SYRINGES AND PENS**

- Use a 30-unit syringe if you take 30 units of insulin or less.
- Use a 50-unit syringe if you take 50 units of insulin or less.
- Use a syringe that shows 1/2-unit marks if you need 1/2 a unit of insulin.
- Be sure that you can clearly see the markings on your syringe.
- No prescription is needed for insulin syringes.
- If you have poor eyesight or arthritis in your hands, talk to your healthcare provider about using another method, such as an insulin pen.
- Your healthcare provider can show you the different sizes of syringes and help you choose what works best for you.

Needles are described by length and thickness (“gauge”).
- The standard needle is 1/2-inch long.
- Needles also come in 5/16-inch and 3/16-inch lengths.
- The 3/16-inch length is often used for children.
- The thinner the needle, the higher its gauge. For example, a 31-gauge needle is thinner than a 28-gauge needle.

**Insulin pens** look like writing pens, except that there is a thin, short needle at the end.
- Some insulin pens can be refilled, while other pens are thrown away when empty.
- Pre-filled insulin pens come with either one type of insulin or a mixture of two types of insulin.
- Insulin pens with pre-mixed work if they match your prescription.
- You may need one insulin pen for each type of insulin if pre-mix does not match your prescription.

**Insulin pumps** are used by people who have type 1 diabetes. People with type 2 diabetes rarely use an insulin pump. Insulin pumps give a continuous dose of insulin. Talk to your healthcare provider if you think an insulin pump might be right for you.
There are no insulin pills. You must use a shot, a special kind of pen, or an insulin pump to get insulin into the body.

Using a shot is the most common way to get insulin into your body. The shot is given using a syringe.

The needle is smaller than most needles you may have seen.

The shot is given just under the skin in the fatty part of your arm, leg or belly.

Here is a picture of insulin syringes.

Syringes come in different sizes.

- If you take 30 units or less, use a 30 unit syringe
- If you take 50 units or less, use a 50 unit syringe
- If you take 100 units or less, use a 100 unit syringe
- Make sure you can see the markings on your syringe.

A prescription is not needed to buy the syringes.

Your healthcare provider can help you decide which is the best syringe for you.

Insulin pens look like a writing pen, but there is a small needle on the end. Some pens can be refilled, others are thrown away when empty.

Insulin pumps are most often used for people with type 1 diabetes. They give small amounts of insulin throughout the day. A pump is not usually used in people with type 2 diabetes.

Your healthcare provider will teach you about ways to take insulin.
Using syringes: Version 1
Low literacy
Using syringes: Version 2
Very low literacy

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Insulin pumps are most often used for people with type 1 diabetes. They give small amounts of insulin throughout the day. A pump is not usually used in people with type 2 diabetes.

Your healthcare provider will teach you about ways to take insulin.
Needle safety: Version 1

Do not:
- Use a container that will allow the needle to puncture through the side.
- Use a glass jar.
- Use a container that might go into the recycling.
- Put used syringes or lancets into the garbage or trash unless they are in a special container.

Syringes should be used only once:
- Needles are made for single use.
- Reused syringes are not sterile.

NEVER share used syringes with anyone else. You can pass diseases or spread infection by sharing needles.

People with diabetes use sharp objects to check blood sugar and inject insulin. These sharp items should be thrown away safely.

You should:
- Always put the syringes and lancets — the piece that pricks your skin to check your blood sugar — in a heavy plastic or metal box with a tight lid or you can get a red "sharp" container at the pharmacy.
- Keep the container in a safe place in your house, away from children. On top of the refrigerator is a good place.
- When the container is filled, tighten the lid and tape it with heavy-duty tape before throwing it out.
- Some cities may allow you to put the container in the trash.
- Check with your local health department or clinic to find out how to get rid of your syringes and lancets.
Needle safety: Version 2

**NEEDLE SAFETY**

People with diabetes use sharp instruments to check blood sugar and inject insulin. It is important that you safely dispose of insulin needles and lancets, the sharp tools that pierce the skin for blood sugar checks.

**Syringes and lancets must be handled carefully and treated as “medical waste.”**

- Right after injecting your insulin, put the syringe into your syringe disposal container.
- A syringe disposal container is a heavy-duty plastic or metal box that closes firmly or a heavy-duty plastic bottle with a screw top. A special "sharps container" may be provided by your pharmacy or clinic.
- Store the container in a safe place in your house, away from children. On top of the refrigerator is a good place.
- When the container is filled, tighten the lid and reinforce it with heavy-duty tape before disposing of it.
- Some areas may allow you to put the sealed container in the trash. You may want to use a drop box, supervised collection site, mail-back program, or syringe exchange program.
- Check with your local health department or clinic to find out how to dispose of medical waste in your area.

---

**NEEDLE SAFETY**

Do not do any of the following:

- Use a container that will allow the needle to punch through the side.
- Use a container made of glass.
- Use a container that could end up in the recycling bin.
- Put a used syringe or lancet directly into household garbage or a trashcan.

Syringes should be used only once.

- Never throw needles into the regular garbage.
- Reused syringes are not sterile.

Always check with your healthcare provider before deciding to reuse syringes to see if this practice is safe for you.

NEVER loan a used syringe to anyone else or share syringes. You can pass diseases or spread infection by sharing needles.
Needle safety: Version 1
Very low literacy

People with diabetes use sharp objects to check blood sugar and inject insulin. These sharp items should be thrown away safely.

You should:
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- Check with your local health department or clinic to find out how to get rid of your syringes and lancets.

Do not:
- Use a container that will allow the needle to punch through the side.
- Use a glass jar.
- Use a container that might go into the recycling.
- Put used syringes or lancets into the garbage or trash unless they are in a special container.

Syringes should be used only once:
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- Reused syringes are not sterile.

NEVER share used syringes with anyone else. You can pass diseases or spread infection by sharing needles.
Starting Insulin – a patient guide

NEEDLE SAFETY

People with diabetes use sharp instruments to check blood sugar and inject insulin. It is important that you safely dispose of insulin needles and lancets, the sharp tools that pierce the skin for blood sugar checks.

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- When the container is filled, tighten the lid and reinforce it with heavy-duty tape before disposing of it.
- Some areas may allow you to put the sealed container in the trash. You may want to use a deep-box, supervised collection site, mail-back program, or sewage exchange program.
- Check with your local health department or clinic to find out how to dispose of medical waste in your area.

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- Use a container made of glass.
- Use a container that could end up in the recycling bin.
- Put a used syringe or lancet directly into household garbage or a trashcan.

Syringes should be used only once:
- Never share needles made for single use.
- Rewarded syringes are not sterile.

Always check with your healthcare provider before deciding to reuse syringes to see if this practice is safe for you.

NEVER Loan a used syringe to anyone else or share syringes. You can pass diseases or spread infection by sharing needles.

Knowledge by Statistics

- Vocabulary: 580
- Grammar: 280
- Pronouns: 12
- Sentences: 22

- Inferences
  - Sentence per Paragraph: 1.2
  - Words per Sentence: 12.5
  - Characters per Word: 3.8

- Readability
  - Flesch Reading Ease: 56.4
  - Flesch-Kincaid Grade Level: 6.4
Many opportunities for “don’t do” errors when patients inject insulin

Hazards—potential errors to prevent
Many opportunities for “don’t do” errors when patients inject insulin – cont.

https://medlineplus.gov/ency/patientinstructions/000660.htm
Possible Insulin Errors

- Self-administration errors
- Self-monitoring errors
- Improper insertion technique
- Bad drawing-up procedure
- Insulin timing
- Using the wrong insulin
- Miscalculating insulin sensitivity factor
- Using an incorrect carbohydrate ratio
- Not checking blood glucose 2 hours after injecting

Source: Diabetes in Control, June 2014.
Activity

• List the actions required to inject insulin (choose syringe or pen).

• How would you educate a patient to complete this task?

• Use action verbs, Plain Language, & Bloom’s taxonomy.
List actions required to inject insulin
(E.g., look at vial/pen to identify name/type of insulin)
Calculating Your Insulin Doses

• Continue your long-acting insulin: 11 units daily.

• Your goal is to wake up with blood sugars between 100-150 as much as possible.

• Cover food with 1:20 ratios at breakfast and lunch and 1:13 at dinner. Correct blood sugars higher than 120 (as long as it’s been at least 3 hours since the last fast-acting insulin dose) with blood sugar minus 120 and divide by 60.
Problem Solving
She did not accurately remember ("eat dinner") the DM ed,
She did not understand ("eat vs had meal"),
Could not apply instructions appropriately,
Could not analyze her situation
Could not evaluate what she did wrong
© Stroh, K., & Gottfredson, L. S. Beyond health literacy: Cognitive demands of diabetes self-management.
Good glucose control requires good judgment

- **IT IS NOT** mechanically following a recipe
- **IT IS** keeping a complex metabolic system under control in often unpredictable circumstances (like accident prevention process)
  - Coordinate a regimen having multiple interacting elements
  - Adjust parts as needed to maintain good control of system buffeted by many other factors
  - Anticipate lag time between (in)action and system response
  - Monitor advance “hidden” indicators (blood glucose) to prevent system veering badly out of control
  - Decide appropriate type and timing of corrective action if system veering off-track
  - Monitor/control other shocks to system (infection, emotional stress)
  - Coordinate regimen with other daily activities
  - Plan ahead (meals, meds, etc.)
    - For the expected
    - For the unexpected and unpredictable
  - Prioritize conflicting demands on time and behavior
**DSM Goals**

- Keep BG under control
- Deal with unexpected events
- Prevent and/or manage complications

---

**Bloom’s taxonomy of educational objectives (cognitive domain)**

### Simplest tasks

1. **Remember**
   - recognize, recall, identify, retrieve

### Most complex tasks

1. **Anticipate effect of various exercises on blood glucose**

2. **Coordinate meds, diet, and exercise**

3. **Determine when & why blood glucose is out of control**

4. **Monitor symptoms; assess whether action is needed; evaluate effectiveness of actions.**

5. **Create daily and contingency plans that control blood glucose.**

6. **Remember to take Rx. Recall effects of exercise on blood glucose.**

---

---

**Recall**

- **DSM Goals**
  - Keep BG under control
  - Deal with unexpected events
  - Prevent and/or manage complications

---

© Stroh, K., & Gottfredson, L. S. Beyond health literacy: Cognitive demands of diabetes self-management.
Blood Sugar Too High or Too Low?

Keeping your blood sugar in control helps you stay healthy and feel good.

"Hypoglycemia" is when your blood sugar is too low.

“Hypog” means “low” and “glycemia” means “sugar.” Hypoglycemia can happen when you:

- Do not eat enough
- Skip a meal
- Exercise without eating
- Eat later than normal
- Drink alcohol
- Take too much medicine
- Get sick

This can make you feel dizzy, shaky, weak and cause your heart to beat fast. You might not be able to see well and your fingers may feel numb.

If you test your blood sugar and it is less than 70, then have some fruit juice, milk, crackers or something sweet.

Test your blood sugar again in 15 minutes. If your blood sugar is still low, then contact your healthcare provider.

"Hyperglycemia" is when your blood sugar is too high.

“Hyper” means “high” and “glycemia” means “sugar.” Hyperglycemia can happen when you:

- Eat too much food
- Do not exercise
- Forget to take your medicine
- Take the wrong amount of medicine
- Are under stress
- Are sick

This can make you feel tired or thirsty, and can cause blurry vision, hunger, and headaches. Sometimes if your sugar is high for a long time, then you may have to pee a lot. It might take cuts or sores a longer time to heal.

If your blood sugar is high, then you need to think about what you ate, if you ate more than usual, if you took your medicine or the right amount of medicine, or if there was some change in your exercise. If your sugar is high, then your medicine might need to be changed. If your blood sugar is more than 400, then you need to see a healthcare provider right away.
Does readable = understandable = cognitively accessible?

Blood Sugar Too High or Too Low?

Keeping your blood sugar in control helps you stay healthy and feel good.

"Hypoglycemia" is when your blood sugar is too low. "Hypo" means "low" and "glycemia" means "sugar." Hypoglycemia can happen when you:
- Do not eat enough
- Skip a meal
- Exercise without eating
- Eat later than normal
- Drink alcohol
- Take too much medicine
- Get sick

This can make you feel dizzy, shaky, weak and cause your heart to beat fast. You might not be able to see well and your fingers may feel numb.

If you test your blood sugar and it is less than 70, then have some fruit juice, milk, crackers or something sweet.

Test your blood sugar again in 15 minutes.
If your blood sugar is still low, then contact your healthcare provider.

"Hyperglycemia" is when your blood sugar is too high.
"Hyper" means "high" and "glycemia" means "sugar." Hyperglycemia can happen when you:
- Eat too much food
- Do not exercise
- Forget to take your medicine
- Take the wrong amount of medicine
- Are under stress
- Are sick

This can make you feel tired or thirsty, and can cause blurry vision, hunger, and headaches. Sometimes if your sugar is high for a long time, then you may have to pee a lot. It might take cuts or sores a longer time to heal.

If your blood sugar is high, then you need to think about what you ate, if you ate more than usual, if you took your medicine or the right amount of medicine, or if there was some change in your exercise. If your sugar is high, then your medicine might need to be changed. If your blood sugar is more than 400, then you need to see a healthcare provider right away.
Traveling with diabetes – How can you improve these instructions?

1. Plan ahead
2. Talk to your healthcare provider
3. Pack everything you need
4. Know TSA rules
5. Keep everything with you
6. Know your time zone
7. Know when to take medication
8. Get information about how to prevent DVTs
9. Protect yourself against dehydration on long plane trips
10. Guard against infection; use hand sanitizer
11. Plan for activity
12. Plan for local foods
13. Always have a glucose source
14. Be ready for disruptions in schedules, lost luggage, etc.
Reducing Risks
<table>
<thead>
<tr>
<th>A1c (%)</th>
<th>eAG (mg/dL)</th>
<th>Estimated Average Glucose</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td>126</td>
<td></td>
</tr>
<tr>
<td>6.5</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>7.0</td>
<td>154</td>
<td></td>
</tr>
<tr>
<td>7.5</td>
<td>169</td>
<td></td>
</tr>
<tr>
<td>8.0</td>
<td>183</td>
<td></td>
</tr>
<tr>
<td>8.5</td>
<td>197</td>
<td></td>
</tr>
<tr>
<td>9.0</td>
<td>212</td>
<td></td>
</tr>
<tr>
<td>9.5</td>
<td>226</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>240</td>
<td></td>
</tr>
</tbody>
</table>

American Diabetes Association: www.diabetes.org/professional/eAG
The Contribution of PPG to Hyperglycemia Increases as A1C Improves

PPG = post-prandial glucose
Foot Care
Dr. Najafi, professor of surgery at Baylor College of Medicine, Houston, said that in 2015, approximately one-third of all diabetes-related costs in the United States were spent on diabetic foot ulcers (DFUs). “Unfortunately, many DFUs end up in amputation, which could devastate patients and their families,” he said.

“On the same note, persons within the lowest income brackets are estimated to have 38% higher amputation rate, compared with those in the highest income bracket.

All these highlight an important gap in effective management of DFUs, in particular among poor working-class people.”
Eye Care:

Eye exam

vs

*Dilated* Retinal Eye Exam
Bloom’s taxonomy of educational objectives (cognitive domain)

**Simplest tasks**

1. Remember
   - recognize, recall,
   - identify, retrieve

2. Understand
   - paraphrase, summarize,
   - compare, predict, infer,

3. Apply
   - execute familiar task,
   - apply procedure to unfamiliar task

4. Analyze
   - distinguish, focus, select,
   - integrate, coordinate

5. Evaluate
   - check, monitor, detect inconsistencies,
   - judge effectiveness

6. Create
   - hypothesize, plan, invent,
   - devise, design

**Most complex tasks**
CVD Risk Reduction

Dietary Requirements
Carbs

Fats

Cholesterol

Sodium

Enjoy!!
Distracting, non-relevant information makes a task **more** complex.

*Eliminating* non-relevant information makes a task **less** complex.
Healthy Coping
DSMES
Person’s cognitive access to information

Cognitive access = person’s mental resources – task’s cognitive demands

But
Both resources and demands can rise or fall
DSMES aims to assess both
DSMES aims to increase (2) and decrease (3)
### ASSESSMENT TOOLS

#### Checklist for assessing patient's cognitive resources, help, & drains in learning and doing self-care tasks

*Check all items that apply to this patient or group.*

#### Cognitive resources available to patient

<table>
<thead>
<tr>
<th>Cognitive ability level (under favorable conditions)</th>
<th>Literacy level</th>
<th>Extra cognitive help needed</th>
<th>Risk of critical error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>Low</td>
<td>Moderate</td>
<td>Minimal</td>
</tr>
<tr>
<td>Often</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rarely</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Cognitive drains likely to interfere with patient fully using available cognitive resources

<table>
<thead>
<tr>
<th>Emotional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anger</td>
</tr>
<tr>
<td>Anxiety</td>
</tr>
<tr>
<td>Depression</td>
</tr>
<tr>
<td>Family conflict</td>
</tr>
<tr>
<td>Fear</td>
</tr>
<tr>
<td>Frustration</td>
</tr>
<tr>
<td>Shame</td>
</tr>
<tr>
<td>Worry</td>
</tr>
<tr>
<td>Other (please specify)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol &amp; drugs</td>
</tr>
<tr>
<td>Fatigue</td>
</tr>
<tr>
<td>Hunger</td>
</tr>
<tr>
<td>Illness</td>
</tr>
<tr>
<td>Medication</td>
</tr>
<tr>
<td>Pain</td>
</tr>
<tr>
<td>Sleep deprived</td>
</tr>
<tr>
<td>Other (please specify)</td>
</tr>
</tbody>
</table>

#### Cognitive help from others

<table>
<thead>
<tr>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
</tr>
<tr>
<td>So-so</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Negative (confuse, burden, discourage, misinform, etc.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Neighborhood &amp; friends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
</tr>
<tr>
<td>So-so</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Support groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
</tr>
<tr>
<td>So-so</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health care providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
</tr>
<tr>
<td>So-so</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Negative</td>
</tr>
</tbody>
</table>
How do you assess a patient’s coping ability and/or barriers to adherence?
Self-efficacy

Self-efficacy is the belief that one can tackle a task without any assistance. Social-cognitive models of behavior show self-efficacy as a predictor of health behavior change. Self-efficacy predicts the formation of behavioral intentions and the development and implementation of an action plan. One way to determine a patient's self-efficacy is to ask questions pertaining to their level of confidence to perform a specific task, such as "How confident are you that you can take your medications on a daily basis?" If the patient does not believe they are capable of following a plan of care because they have not reached a level of self-efficacy, they will most likely not adhere.

Regardless of whether these predictors of adherence exist, there are additional "risk factors" that could explain why your patient may be non-adherent. Once suspicion is raised, it is important to take the next step and attempt to measure medication adherence. Although multiple objective and subjective tools exist, there is no single, gold standard.

Characteristics of Patients at HIGH Risk of Non-Adherence

- Not refilling an Rx
- Forgetfulness
- Poor eyesight
- Depression
- Language barrier
- Cultural gaps
- Poor coping skills
- Missing appointments
- Multiple co-morbidities
- Lack of trust in their provider
- No prescription drug coverage
- Inadequate response to therapy or lack of appropriate follow-up
- Does not understand their condition
- Medical condition without symptoms
The Illness Perception Questionnaire

Research using a variety of different assessment techniques suggests patients cluster their ideas about illness around five coherent themes or components: cause, timeline, consequences of illness, control, and emotional reactions. Each of these components holds a perception about one aspect of the illness and together they provide the individual and his/ her care giving community with a picture of the illness.

The major cognitive components identified from research are: identity - which comprises the label of the illness and the symptoms the patient views as reflective of the illness; cause - with specific beliefs about what or who caused the illness and current beliefs about cure or control of the health problem; timeline - how long a condition will last and the sequence as well as the number of symptoms; and consequences - beliefs about the effects of the illness on the patient, on work, on family, and on relationships.

An important question that we have asked is where do illness beliefs come from? Is it an individual or the place of residence? Are they related to the experiences of the individual or the caregivers? Parental models of illness are not always clear, especially in young children, and the beliefs about health and illness are influenced by cultural factors. Each of these components on their own may influence the individual's treatment choice and behavior. The components are not isolated but interact with each other.

The components of the questionnaire are:

<table>
<thead>
<tr>
<th>Component</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identity</td>
<td>Rating the number of symptoms the patient sees as part of the illness.</td>
</tr>
<tr>
<td></td>
<td>Examples from the CPS: identity scale include nausea, sore or swollen joints, forgetfulness, dizziness, stiffness, or sore joints, fatigue after activity.</td>
</tr>
<tr>
<td>Cause</td>
<td>A germ or virus caused my illness.</td>
</tr>
<tr>
<td></td>
<td>Fatigue, overeating or under eating caused my illness.</td>
</tr>
<tr>
<td></td>
<td>Stress was a major factor in causing my illness.</td>
</tr>
<tr>
<td>Timeline</td>
<td>My illness is likely to be permanent rather than temporary.</td>
</tr>
<tr>
<td></td>
<td>My illness will last for a long time.</td>
</tr>
<tr>
<td>Consequences</td>
<td>My illness has major consequences on my life.</td>
</tr>
<tr>
<td></td>
<td>My illness is a serious condition.</td>
</tr>
<tr>
<td>Cure-Control</td>
<td>There is little that can be done to improve my illness.</td>
</tr>
<tr>
<td></td>
<td>My treatment will be effective in curing my illness.</td>
</tr>
</tbody>
</table>

Illness perceptions have wide varieties of uses in the health psychology area. Illness perception has been used to explain behavior following heart attacks, responses to cancer, and less serious conditions such as rheumatoid arthritis.
### YOUR VIEWS ABOUT YOUR DIABETES

Listed below are a number of symptoms that you may or may not have experienced since your diabetes. Please indicate by circling Yes or No, whether you have experienced any of these symptoms since your diabetes, and whether you believe that these symptoms are related to your diabetes.

<table>
<thead>
<tr>
<th></th>
<th>I have experienced this symptom since my diabetes</th>
<th>This symptom is related to my diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Sore Throat</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Nausea</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Breathlessness</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Weight Loss</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Stiff Joints</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Sore Eyes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Wheeziness</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Headaches</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Upset Stomach</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Sleep Difficulties</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Dizziness</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Loss of Strength</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
We are interested in your own personal views of how you now see your current diabetes.

Please indicate how much you agree or disagree with the following statements about your diabetes by ticking the appropriate box.

<table>
<thead>
<tr>
<th>VIEWS ABOUT YOUR DIABETES</th>
<th>STRONGLY DISAGREE</th>
<th>DISAGREE</th>
<th>NEITHER AGREE NOR DISAGREE</th>
<th>AGREE</th>
<th>STRONGLY AGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] My diabetes will last a short time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[ ] My diabetes is likely to be permanent rather than temporary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[ ] My diabetes will last for a long time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIEWS ABOUT YOUR DIABETES</td>
<td>STRONGLY DISAGREE</td>
<td>DISAGREE</td>
<td>NEITHER AGREE NOR DISAGREE</td>
<td>AGREE</td>
<td>STRONGLY AGREE</td>
</tr>
<tr>
<td>---------------------------</td>
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<td>---------------</td>
</tr>
<tr>
<td>IP10</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>IP11</td>
<td></td>
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<tr>
<td>IP12</td>
<td></td>
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<tr>
<td>IP13</td>
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<tr>
<td>IP14</td>
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<tr>
<td>IP15</td>
<td></td>
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<tr>
<td>IP16</td>
<td></td>
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<tr>
<td>IP17</td>
<td></td>
<td></td>
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<tr>
<td>IP18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP 19</td>
<td>There is very little that can be done to improve my diabetes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP 20</td>
<td>My treatment will be effective in curing my diabetes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP 21</td>
<td>The negative effects of my diabetes can be prevented (avoided) by my treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP 22</td>
<td>My treatment can control my diabetes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP 23</td>
<td>There is nothing which can help my condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP 24</td>
<td>The symptoms of my condition are puzzling to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP 25</td>
<td>My diabetes is a mystery to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>Statement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1226</td>
<td>I don't understand my diabetes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1227</td>
<td>My diabetes doesn't make any sense to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1228*</td>
<td>I have a clear picture or understanding of my condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1229</td>
<td>The symptoms of my diabetes change a great deal from day to day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1230</td>
<td>My symptoms come and go in cycles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1231</td>
<td>My diabetes is very unpredictable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1232</td>
<td>I go through cycles in which my diabetes gets better and worse.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1233</td>
<td>I get depressed when I think about my diabetes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1234</td>
<td>When I think about my diabetes I get upset</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1235</td>
<td>My diabetes makes me feel angry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1236*</td>
<td>My diabetes does not worry me</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1237</td>
<td>Having this diabetes makes me feel anxious</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1238</td>
<td>My diabetes makes me feel afraid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
THE DIABETES DISTRESS SCREENING SCALE

DIRECTIONS: Living with diabetes can sometimes be tough. There may be many problems and hassles concerning diabetes and they can vary greatly in severity. Problems may range from minor hassles to major life difficulties. Listed below are 2 potential problem areas that people with diabetes may experience. Consider the degree to which each of the 2 items may have distressed or bothered you DURING THE PAST MONTH and circle the appropriate number.

Please note that we are asking you to indicate the degree to which each item may be bothering you in your life, NOT whether the item is merely true for you. If you feel that a particular item is not a bother or a problem for you, you would circle "1". If it is very bothersome to you, you might circle "6".

<table>
<thead>
<tr>
<th></th>
<th>Not a Problem</th>
<th>A Slight Problem</th>
<th>A Moderate Problem</th>
<th>Somewhat Serious Problem</th>
<th>A Serious Problem</th>
<th>A Very Serious Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feeling overwhelmed by the demands of living with diabetes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. Feeling that I am often failing with my diabetes routine.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Not a Problem</td>
<td>A Slight Problem</td>
<td>A Moderate Problem</td>
<td>Somewhat Serious Problem</td>
<td>A Serious Problem</td>
<td>A Very Serious Problem</td>
</tr>
<tr>
<td>---</td>
<td>---------------</td>
<td>------------------</td>
<td>--------------------</td>
<td>--------------------------</td>
<td>------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>1</td>
<td>Feeling that diabetes is taking up too much of my mental and physical energy every day.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Feeling that my doctor doesn't know enough about diabetes and diabetes care.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Feeling angry, scared, and/or depressed when I think about living with diabetes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Feeling that my doctor doesn't give me clear enough directions on how to manage my diabetes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Feeling that I am not testing my blood sugars frequently enough.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Feeling that I am often failing with my diabetes routine.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Feeling that friends or family are not supportive enough of self-care efforts (e.g. planning activities that conflict with my schedule, encouraging me to eat the &quot;wrong&quot; foods).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Feeling that diabetes controls my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Not a Problem</td>
<td>A Slight Problem</td>
<td>A Moderate Problem</td>
<td>Somewhat Serious Problem</td>
<td>A Serious Problem</td>
<td>A Very Serious Problem</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>9. Feeling that my doctor doesn't take my concerns seriously enough.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10. Not feeling confident in my day-to-day ability to manage diabetes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>11. Feeling that I will end up with serious long-term complications, no matter what I do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>12. Feeling that I am not sticking closely enough to a good meal plan.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>13. Feeling that friends or family don't appreciate how difficult living with diabetes can be.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>14. Feeling overwhelmed by the demands of living with diabetes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>15. Feeling that I don't have a doctor who I can see regularly enough about my diabetes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>16. Not feeling motivated to keep up my diabetes self-management.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>17. Feeling that friends or family don't give me the emotional support that I would like.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
Are these assessment tools cognitively accessible to patients?

If not......

How do you assess a patient’s coping ability and barriers to adherence?
Smart people busy making life more complex

Goal = make DSM more cognitively accessible.
Linda Gottfredson  
gottfred@udel.edu

Kathy Stroh  
kathy.stroh@westsidehealth.org

Slides & handouts available at:
www1.udel.edu/educ/gottfredson/reprints/2017AADEworkshop.pdf
www1.udel.edu/educ/gottfredson/reprints/2017AADEworkshop-handouts.pdf