Diabetes: Teaching Patients Self-Care

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Course Summary

Healthcare professionals who are not diabetes educators are still often called upon to teach diabetes patients techniques of self-care. This involves an understanding about how adults learn and how to create an environment that supports their learning. It is essential to the daily life and future of people with diabetes that they understand and practice self-care so they can manage a disease that can be devastating if it is left unchecked.

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80% or higher on the post test, a completed evaluation form, and payment where required. No partial credit will be awarded.

Course Objectives

When you finish this course you will be able to:

1. Explain the four classes of diabetes and how they differ from one another.
2. Discuss the ways you can motivate a diabetes patient using at least two of the education models presented here.
3. Be prepared to create a lesson plan for a patient, with the goal of achieving a specific new aspect of self-care.

Teaching Diabetes Self-Care

Have you ever tried to introduce diabetes to a newly diagnosed patient and found yourself at a loss? Do you stumble trying to explain the difference between type 1 and type 2 diabetes? Are you frustrated by the disconnect between your own understanding of diabetes and your ability to explain it? You are not alone! Diabetes educators *specialize* in the management of diabetes and effectively teaching it to patients.

As a healthcare professional you have learned the basics of diabetes mellitus, but not how to teach a patient who lives with it. Simplifying pathophysiology, medication usage, blood glucose monitoring, meal planning, and overall management of the disease is daunting but it is a skill you can acquire with practice. Teaching patients to take their prescribed medications correctly may be as important as the medication itself because, without a good understanding, patients may take it incorrectly, with poor outcomes.

Studies confirm positive behavioral and economic outcomes of outpatient diabetes education programs on self-care (Brown, 1990). Patients with diabetes who have received diabetes education have better A1C glycosylated hemoglobin levels, fewer emergency department (ED) visits, and better overall health compared to those with diabetes who never received education. Clearly diabetes education matters.

The Need for Diabetes Educators

With over 29.1 million Americans—9.3% of the United States population—diagnosed with diabetes and another 86 million with prediabetes, there are a lot of people needing diabetes education (ADA, 2014). Diabetes is steadily increasing in incidence and prevalence in the United States and remains the seventh leading or contributing cause of death; further, it represents almost 26% of adults age 65 and older, which is 1 out of every 4 elders.

Diabetes in youth age 20 and under has also continued to rise, to 208,000 Americans compared to approximately 23,500 in 2008. Overweight and obesity trends and an aging population have been identified as risk factors causing the growing "diabesity" epidemic in our country. Almost 50% of all Americans are overweight or obese. Clearly a lot of people need your professional knowledge for health education, prevention, treatment, and management of diabetes. It's a sad truth, but with the climbing rates of diabetes and obesity and projected trends, those who teach patients with diabetes have job security!

Most people with diabetes hear about the disease initially from a healthcare professional, and yet many people with diabetes leave more confused after being given the startling diagnosis because of the heavy use of medical jargon and the complicated information. Being able to simplify diabetes education and meet the learning needs of your patient can make the difference between patients who leave feeling empowered to take control of their diabetes or feeling overwhelmed, depressed, and inclined toward noncompliance.

Although there is plenty of information available via the Internet for anyone to learn about diabetes, most people need the help of a healthcare professional to decipher the information. Referring patients to www.diabetes.org is a great resource of the American Diabetes Association, but it is not enough. You are still needed to help guide your patients through the vast resources on diabetes.

Describing Diabetes Mellitus

A quick review of diabetes mellitus will give you confidence when you are needed to help a newly diagnosed patient cope with this sometimes overwhelming diagnosis.

What Is This Disease?

Knowing more about diabetes, and how to teach your patients about it, will put you in a position to answer the question "What is diabetes mellitus?" **Diabetes mellitus** has formally been defined by the American Diabetes Association as "a group of metabolic diseases characterized by hyperglycemia resulting from defects in the insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term macro- and microvascular damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels" (ADA, 2011).

Although that is a correct medical definition, it can be frightening and unintelligible to a patient who may still be in disbelief about having diabetes. Being able to simplify the definition to "Diabetes means your body doesn't use your food effectively" makes more sense to most people.

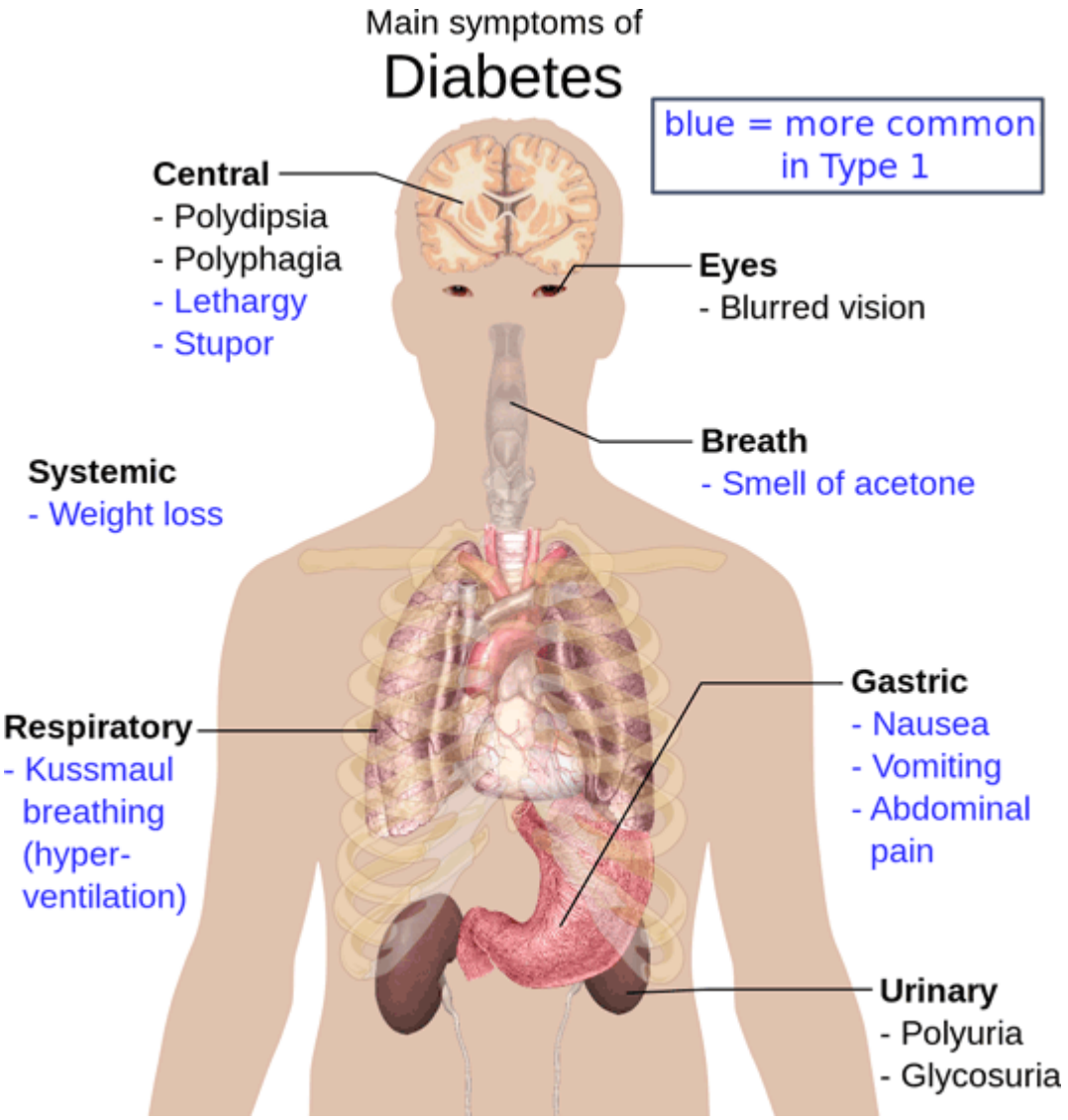
Diabetes was recognized as a medical problem over 2000 years ago in Greek writings, so it is not a new disease. It wasn't until the early 1900s, however, that insulin was identified as the hormone that controls blood sugar levels. Early scientists removed the pancreas from a dog, thus creating a diabetic dog, which helped them confirm that the pancreas produces insulin from beta cells within the islets of Langerhans. In 1921 insulin was finally purified for human injection by Eli Lilly, an early pharmaceutical company, which began the treatment to save lives for type 1 diabetics who produced no insulin.

What Is the Disease Process?

Without insulin, the food we eat, broken down into simple forms of **glucose**, can't enter the cells of the body and remains in the bloodstream. After a meal, glucose levels in the body rise, which triggers insulin to be released from the beta cells of the pancreas. Glucose levels in the blood fall as glucose moves into the cells, where it is used for energy production to fuel the body. Extra glucose in the blood can be stored in fat and skeletal muscle tissue. Glucose stored in the liver becomes **glycogen**.

An opposing hormone, **glucagon**, has the opposite effect of insulin, resulting in elevated levels of glucose in the blood, where it can be sent for energy throughout the body. The perfect balance of insulin and glucagon production keeps our blood sugar levels regulated between 60 and 100 mg/dL in a fasting state and 100 to <140 mg/dl 2 hours after a meal.

When the body doesn't produce any insulin (type 1 diabetes) or has a sluggish or resistant response to insulin (type 2 diabetes), chronic hyperglycemia develops; this is known as *diabetes mellitus*. The term *diabetes* means "to siphon through," which refers to the loss of urine as the body attempts to rid itself of the excess glucose and pulls water along with it. The term *mellitus* was added years later; it means "sweet" or "honey," referring to the glucose in the urine.



Source: Mikael Häggström, 2014. Wikimedia Commons.

Types of Diabetes

The pathology that causes each type of diabetes is different, and it is important for a patient to understand the medical management for their particular type of diabetes. In **type 1 diabetes** (the term now used instead of the older term *juvenile diabetes*), the body stops producing insulin completely. This has been linked to an autoimmune response and occurs mostly in children, representing only 5% to 10% of all people with diabetes.

People with type 1 diabetes have to take insulin injections or they will die, as their brain and body cells starve without the needed glucose. The body can use protein and fat for fuel but the ketones from metabolizing these fuels can create acidosis and become toxic to the body, leading to death. The discovery of insulin through injections has saved millions of lives.

Type 2 diabetes, representing 90% to 95% of all people with diabetes, stems from cellular insulin resistance, or sluggish insulin production, and is generally found in adults. Insulin resistance has a genetic risk and is often found in people who are overweight or obese. Type 2 diabetes can generally be treated with weight loss, meal planning, and exercise because the onset is related to overweight and obesity in 75% of diabetic patients. If lifestyle modifications don't help, then medication management is added.

Differences Between Type 1 and Type 2 Diabetes	
Type 1 Diabetes	Type 2 Diabetes
Symptoms usually start in childhood or young adulthood. People often seek medical help, because they are seriously ill from sudden symptoms of high blood sugar.	The person may not have symptoms before diagnosis. Usually the disease is discovered in adulthood, but an increasing number of children are being diagnosed with the disease.
Episodes of low blood sugar level (hypoglycemia) are common.	There are no episodes of low blood sugar level, unless the person is taking insulin or certain diabetes medicines.
Cannot be prevented.	Can be prevented or delayed with a healthy lifestyle, including maintaining a healthy weight, eating sensibly, and exercising regularly.

Source: WebMD, 2014.

In the past decades the only medications available were insulin and a single class of antihyperglycemics called **sulfonylureas**. Today more than eight classes have been created, making medication management more complex. People often think incorrectly that if you take insulin you have type 1 diabetes and if you could manage blood sugar levels with a pill you have type 2 diabetes. Research has added significantly to our understanding of the pathophysiology, and type 2 diabetes involves more organs than just the pancreas. Some patients with type 2 may eventually require insulin injections due to pancreatic fatigue and the duration of the disease.

The third class of diabetes is **gestational diabetes** and it results when hyperglycemia is first manifest during pregnancy. Many pregnant women with diabetes can control blood sugars by careful food planning and avoidance of simple sugars during pregnancy, however some may require insulin injections just for the duration of the pregnancy. Gestational diabetes only occurs in about 2% to 5% of all pregnancies. Unfortunately, a women with gestational diabetes may be at 4 to 6 times greater risk of developing type 2 diabetes later in life.

The problem with hyperglycemia during pregnancy is potentially the large growth of the baby, who has been used to high volumes of glucose during gestation, and delivery complications for the mother. Generally, after the baby is born the mother's blood glucose stabilizes and she will no longer need insulin. The baby, who had been so used to hyperglycemia in utero, does run the risk of dropping into hypoglycemia after birth and must be monitored until stable.

A fourth class of diabetes is "other," and it includes endocrinopathies, mature onset diabetes of the young (MODY), and latent autoimmune diabetes of the adult (LADA, or diabetes 1.5). The pathophysiology of each varies and is related to genetic problems, hormone imbalance, and autoimmune destruction of beta cells. The "other" category also includes prediabetes and impaired fasting glucose (IFG).

Both prediabetes and IFG are precursors to diabetes and deserve increased attention by healthcare professionals to avoid chronic hyperglycemia and complications. Each class of diabetes requires different medication management based on the unique needs of the individual.

Knowing what kind of diabetes patients have been diagnosed with is important so you can help them understand specifically what is happening within their own body. The more informed you are about patients' type of diabetes the better you can anticipate problems they may experience and develop a plan for prevention. By teaching them about symptoms of complications you can help identify problems earlier and get appropriate treatment sooner.

Using common analogies to explain the pathophysiology also can be helpful. Many diabetes educators use the comparison of insulin in the body like a lock (a body cell) and key (the insulin). A patient with type 1 diabetes no longer has the key (insulin) to open the door (the body cell) and food (glucose) cannot be used. The cell ends up starving and suffers damage even if the person eats food.

Even children with type 1 diabetes can understand the analogy of a "diabetic car." A type 1 diabetic car has no insulin (key) to open the gas tank so the tank stays empty, with no fuel for energy. Without being able to open the lid, a meal is eaten but no gas enters the tank and the car doesn't function correctly. An outside key must be used (insulin injection) to open the tank and fill it with gas (food). A type 2 car is able to receive some gas, however a lot of it spills on the outside of the car leaving noticeably high gas levels (glucose levels) outside the tank.

Using analogies, comparisons, and simple common terms and objects that people are familiar with can help them understand the complicated diabetes pathophysiology. Approaching patient education in simple terms can be less scary for both you and the patient. Many pharmaceutical companies involved in diabetes products and education have wonderful pictures, diagrams, and other resources to help teach the basic anatomy and physiology of food metabolism and diabetes (see Resources at the end of the course).

Clinical Scenario

Mr. Johnson wonders why he now has to take four insulin injections each day for his diabetes when he used to take a pill only twice daily.

Q: What questions would you ask Mr. Johnson to help him understand the medical management for his diabetes?

A: Examples could include:

- How long have you had diabetes?
- Tell me what you understand causes diabetes?
- Did you try weight loss, exercise, and meal management?
- What do you understand about insulin?

Overcoming Barriers to Effective Teaching

Many barriers prevent healthcare professionals from teaching effectively, or even at all. The first barrier is the fear of inadequate knowledge about the disease. Some don't know all the facts about diabetes and feel embarrassed to admit it in front of a patient, so they just omit the teaching. You do not have to be a certified diabetes educator (CDE) to teach patients about diabetes. Healthcare professionals who teach about diabetes include lay health workers, health aids, medical assistants, nurses, pharmacists, physical therapists, social workers, nurse practitioners, physician assistants, and certified diabetes educators.

Clearly knowledge is needed before you can teach, however research confirms the adage that people care more about how much you care and not just how much you know (Ciechanowski, 2001;Brown, 1990). Creating relationships of trust, non-judgment, and emotional safety are foundational for effective teaching.

Barriers to teaching also include poor communication, lack of time, low priority in acute settings, low or no reimbursement for teaching, low resources, and low interest from the patient; yet making sure the information is correct and correctly understood are critical to good patient outcomes. Overcoming these barriers has been the quest of the American Association of Diabetes Educators (AADE), and the organization is a wonderful resource for content, study guides, and even lesson plans for teaching (www.diabeteseducator.org).

Strategies to overcome barriers of poor communication begin with simplifying medical jargon. Healthcare professionals speak in medical (often Latin) vocabulary that can be confusing to patients. A persisting legend tells that a physician teaching a patient to inject insulin used an orange for practice. After having the patient return-demonstrate how to draw up and inject the insulin into the orange, the physician felt confident that the patient understood. Weeks later ,when the patient returned for a followup appointment, the patient's blood glucose levels remained extremely high. Puzzled, the physician asked the patient if he was still taking the insulin injections as instructed. "Of course," declared the patient. "But I don't understand how injecting it into the orange is going to help my diabetes."

Clearly, we often make assumptions about what the patient understands and forget we may speak a different language! Try to simplify the vocabulary you use as you discuss pathophysiology and other diabetes topics. Instead of saying "insulin resistant," you could say "Your muscles don't use the insulin you may be producing." Instead of metabolic acidosis, you could say "When the body has too much sugar and no insulin it creates a state of too much acid, which makes the body sick."

For communication barriers related to foreign language, it is important to have a professional translator or use pamphlets and instructional material in the native tongue of the patient. Many credible online sources, including the National Institutes of Health (NIH), provide a large library of free patient education materials in Spanish, Tagalog, and many other foreign languages.

Remember, second-language learners who are conversant in English may still be unfamiliar with slang words common to native English speakers. Phrases such as "fast-food" and "eat and run" may be confusing. Clarify terms and confirm understanding periodically during a teaching session to avoid undesirable outcomes. Click this link for more information.

Another barrier to effective communication has been the approach, often perceived as condescending, when the goal was getting a patient to "comply" with a medical plan of care. Compliance and adherence have always been legitimate issues of concern for healthcare professionals. In the past, educators were often sent to "set the patient straight" or use scare tactics to get a patient to adhere to the prescribed management regimen.

Traditional approaches to patient education have been disease-oriented and based on compliance. If patients disagreed with a plan of care, couldn't afford the medications, or wanted to try alternative therapies, they were often seen as noncompliant. Good patient outcomes suffered if patients felt judged or dismissed. A useful strategy to overcome this barrier is for healthcare professionals to take on the role of health *coaches* instead of health dictators. Creating a partnership with the patient improves health outcomes.

The barriers of lack of time, low priority in acute settings, low or no reimbursement for teaching, low resources, and low interest from the patient can also be overcome. Time for diabetic teaching can be found in regular interactions with patients. Every interaction with a person who has diabetes can help educate the patient without making it a formal session. Giving patients their regular insulin dose in a hospital provides a few minutes for assessing their understanding of the purpose and action of the medication. Testing a patient's blood sugar also creates a space for purposeful conversation.

You may not have the luxury of a half-hour teaching appointment, but can provide a few minutes of teaching during regular interactions of care throughout a shift or home visit. In the acute care setting, diabetes education is often delayed; however, it should be offered after the urgent medical problem has been addressed and the patient is stabilized.

Patients are often more interested in learning how to avoid a hypoglycemic episode or diabetic ketoacidosis (DKA) once they have experienced the emergency. As the saying goes, "When the student is ready, the teacher appears." Lack of time is often cited as an excuse. A strategy to overcome that barrier is leaving a simple pamphlet or note with contact information for future diabetes education when the patient may be ready.

After years of lobbying by the American Association of Diabetes Educators (AADE), using persuasive research to prove the benefits of diabetic education, reimbursement is now available and diabetes education is paid for by most insurance companies. Free resources for diabetes education are exploding in availability. A simple search on the Internet for the word *diabetes* will quickly produce over 250 million links! Healthcare professionals can feel relieved that, even if their patient education time is limited, learning can continue via reputable online sites. Asking the patient if they are interested in free diabetes education may pique their interest in personally searching the Internet if they have computer skills (also see Resources at the end of this course).

Clinical Scenario

Mrs. Sanchez, a patient with type 2 diabetes who has limited English-speaking skill, keeps missing her diabetes education appointment because she "doesn't have transportation" but she does have medical insurance.

Q: What strategies could you use to overcome barriers to her receiving diabetes education?

A: Identify alternative transportation for her. Provide Spanish literature through the mail. Find resources within her neighborhood for diabetes education. Inquire if she has access to a computer and the Internet. Provide education on the phone with a translator. Find her diabetes classes in Spanish.

Patient Centered Diabetes Education

Traditional patient education models focused on disease-oriented patient education (DOPE) and were physician centered. Newer models are known as health-oriented patient education (HOPE) and include empowerment strategies that place the patient rather than the physician at the center; this strategy sees the patient as a partner in decision making. Based on adult learning theory, psychodynamic motivational theories, and the Chronic Care Model, diabetes educators now focus on strategies that help patients help themselves.

The goal of diabetes education is to help patients manage their own chronic disease with the resources of a team of healthcare professionals supporting them. The role of the diabetes educator has changed from "sage on stage" to "guide on the side." Effective diabetes education begins with a paradigm shift to a role as health coach and often cheerleader instead of professional laying down orders for the patient to follow.

Each patient should have a partnership role in making medical decisions. That means patient education must be customized to meet the individual's needs and include the patient's goals and desires. Instead of a diabetes educator simply writing a patient's diet and exercise plan, an effective diabetes educator needs to assess the patient's goals, abilities, barriers, interests, and resources and develop a goal plan together. Adherence improves because patients are working toward their own goals and not those dictated to them.

ASSURE Mnemonic for Teaching

A diabetes educator can ensure effective education by following the activities in the acronym ASSURE.

ASSURE effective education

- **A** Analyze the learner
- **S** State the objectives
- **S** Select appropriate teaching methods
- **U** Use effective instructional materials
- **R** Require learner performance
- **E** Evaluate the learning

Analyze the Learner

"Analyze the learner" means looking at the patient's language ability, age, ethnicity, food preferences, gender, and learning style. People of different ages learn differently. We don't teach a child or adolescent the same way we teach adults. Children need concrete examples to which they can relate, and do well with role play and games, for example. Adults can generally learn by references and analogies. Geriatric patients may need a different approach based on physical limitations such as hearing or vision.

It is essential to confirm English-speaking ability, literacy, and ability to understand written information. According to the National Center for Education Statistics, a national literacy survey found 23% of our adult population lack adequate literacy skills and may not read above a fifth-grade level (National Institute of Literacy, 2013; NCES, 2002). When presenting material to patients in written form, look for simply worded phrases and the inclusion of illustrations that can be understood easily across language and literacy levels. Asking about formal education completed can also help guide you in what level of literature would be appropriate for the person.

When teaching about food choices and meal planning for diabetes management, avoid assumptions about foods. Assuming everyone eats cereal for breakfast, or that breakfast is even in the morning when some people work night shift, can impact medications taken with food. Ethnicity may also impact how learners understands diet planning based on their background, preferred first language, values, and even associations with ethnic foods.

Do not assume people who "look like you" are the same as you! With the growing diversity in our country, people come from a large variety of backgrounds with cultural norms that impact their health; these may include food preferences and even adoption of complementary and alternative therapies. Simply asking people open-ended questions like "What do you typically eat for daily meals?" will provide valuable information to help you guide them toward healthier choices. Long gone are the days when we would give the same standardized ADA 1800-calorie diet handout to everyone. The patient often threw away the seemingly irrelevant pamphlet.

Effectively teaching someone with diabetes about meal planning and food choices must be customized based on food and cooking preferences and resources. Suggesting all patients buy organic produce may be scientifically sound, however not realistic for those on limited budgets or because organic stores may not be near them. Getting a 24-hour or even 3- to 7-day diet history will give you a better idea of what the patient generally eats and prefers in a typical week. Then dietary suggestions for improvement can be made based on tastes, budget, and schedule.

Gender differences are important to consider when teaching a patient about healthcare needs and management of a chronic disease. Women are generally motivated by social relationships and may thrive in a group class. Men, however, are often motivated by task completion and may prefer a one-to-one teaching session so they can be finished and leave. Research shows that male brains are more developed in motor and spatial skills whereas female brains are more developed in verbal and social thinking (Lewis, 2013). Men may prefer to see graphs, charts, and statistics about the disease whereas women may prefer to learn how it will impact their daily life. Of course there is plenty of variation between the genders but the fact remains that education needs to be customized to meet the patient's preferences.

Basic Styles of Learning

Source: Feberal Reserve Bank of Atlanta, 2011.

Descriptions of the Basic Learning Styles

Visual

- Visual learners prefer the use of images, maps, and graphic organizers to access and understand new information.

Auditory

- Auditory learners best understand new content through listening and speaking in situations such as lectures and group discussions. Aural learners use repetition as a study technique and benefit from the use of mnemonic devices.

Read and Write

- Students with a strong reading/writing preference learn best through words. These students may present themselves as copious note takers or avid readers and are able to translate abstract concepts into words and essays.

Kinesthetic

- Students who are kinesthetic learners best understand through tactile representations of information. These students are hands-on learners and learn best through figuring things out by hand (i.e. understanding how a clock works by putting one together).

Source: Teach.com, 2015.

Learning styles also impact how a person learns. Generally people can learn through all the methods shown above, and teachers should include a variety of teaching approaches; however, often people have a preferred method. There are online tests to help you identify your own learning style preference. It’s unrealistic to have every patient take a learning styles preference test before you plan your approach to fit their needs; however, you can assess their style through good questioning.

You can ask them how they prefer to learn new information: by reading, watching a video, seeing a demonstration, or learning by a hands-on approach. Based on their preference you can create a more effective presentation of the needed material. The saying "The more neurons that fire together, wire together" helps us remember that our brains require repetition of information to "hard wire" it, no matter the style.

State the Objectives

There are so many topics that need to be taught regarding diabetes management that it can feel overwhelming to both the clinician and the patient. Before teaching a patient with diabetes, clarify the goal of the learning session. Stating "We're going to talk about diabetes" isn't as clear as "You are going to learn how to test your blood sugar daily with this meter" or "You are going to learn how to use an insulin pen to give yourself the medicine your provider ordered." Notice both sentences focused on what the learner was going to be able to do at the end of the training, rather than what the teacher was going to do.

People need to be able to come away from a teaching or training session with the ability to **do** something that will make a positive impact on their health, and not to just learn academic concepts. Behavior change is the focus of learning sessions in healthcare. Many times the objective of the learning session is given by the prescribing clinician, it may be learning about insulin devices or counting carbs. If you are the one choosing the topic and don't know what to teach, ask the patient what they need or want to learn first. Adult learners are generally task-oriented and already know what they want to learn.

Select Appropriate Teaching Methods

Selecting appropriate teaching methods depends on what you have already discovered about your learner's preferences. The methods of teaching include auditory, visual, one-on-one, group classes, and so on. If a person with diabetes seems interested in a group class, find out your local resources and where you can refer them. If a person says that they prefer private teaching, then schedule that if possible. The following list shows many different methods that could be used for teaching about diabetes:

Audiovisual	Group discussion	Role playing
Case Study	Gaming	Simulation
Computer resources	Lecture	Technology
Conference	One-to-one	Telecommunications
Demonstration	Reading	Workshop

E-learning Return demonstration

Use Effective Instructional Materials

In addition to selecting appropriate teaching methods, using effective instructional materials is important to creating an effective teaching experience for the patient. If you found, for example, that your learner prefers to learn by watching videos, then a pamphlet may be useless unless it summarizes information from the video. If patients disclose they can't read well in English, then other teaching methods need to be chosen.

Written instructional methods can be extremely helpful but they must be written at a fifth-grade reading level and without medical jargon. Using pictures can be helpful for those with limited English proficiency. Pharmaceutical representatives often offer diabetes education materials, generally free of cost. The following list identifies some of the many instructional materials available for diabetes:

Anatomical models Handouts

Charts Pamphlets

Demonstration materials Posters

Displays Puzzles

Food models Videos

Graphs

Require Learner Performance

Learning for knowledge's sake alone may not effect the actual behaviors needed to improve physical health. Notice that, within this course, each module identifies a learning objective. Knowledge becomes powerful when it prepares you to improve action toward a desired goal. The four domains of learning depicted earlier include affective (emotional), behavioral (ability to adopt new behaviors), cognitive (knowledge), and psychomotor (physical ability). As a diabetes educator you will choose some combination of these to achieve the goal of improved patient outcomes.

Insurance companies who pay for diabetes education want to know that their teaching impacts physical health for the better. Learning what insulin does isn't as valuable as developing the skill to inject the insulin correctly and thus improve blood glucose levels. For the patient, learning about hypoglycemia is good but learning to check the blood glucose level regularly and take action when it drops to 60 mg/dL is more relevant for diabetes control.

Choosing an action item for each teaching session is likely to produce a concrete result from the training. Asking the patient "What will you do with this information now?" is meant to connect the learning to an action toward better health. The question is appropriate for you too, what will **you** do with the knowledge you're learning in this diabetes course?

Evaluate the Learning

Evaluating the learning experience is important to ascertain whether your explanation was effective. Simply asking "You understand, right?" won't elicit honest feedback. Many people will say yes just to save face for both their sake and yours. Cultural norms in many Asian cultures demand that patients nod a polite yes even if they don't understand.

In fact, many people don't want to admit they didn't understand. Asking them to state back what you said, or requiring them to do a repeat demonstration after your instruction, will give you a better assessment of their learning. You may see holes in their understanding, which you can then fill. Asking patients to teach you is a good way to assess their understanding. Generally if someone can teach correctly, then they know. Asking open-ended questions after your instruction is also helpful: "Explain to me how insulin works in your body," or "Tell me how you may know if your blood sugar is getting too low."

Clinical Scenario

A diabetic patient looks disinterested when you introduce a pamphlet.

Q: What questions should you ask yourself about using this instructional material?

A: Can the person read? Is the timing right for this patient to learn about diabetes? Does the patient wear glasses? Is there someone else in the family who needs to attend the training session? Is there a language barrier? Is there some other material that this patient will find interesting and informative?

Achieving Patient Behavioral Change

If patients with diabetes are not moved to take action after being taught how to care for themselves they will not thrive. Educators have developed a number of theories about how adults learn and we will look at these in this section.

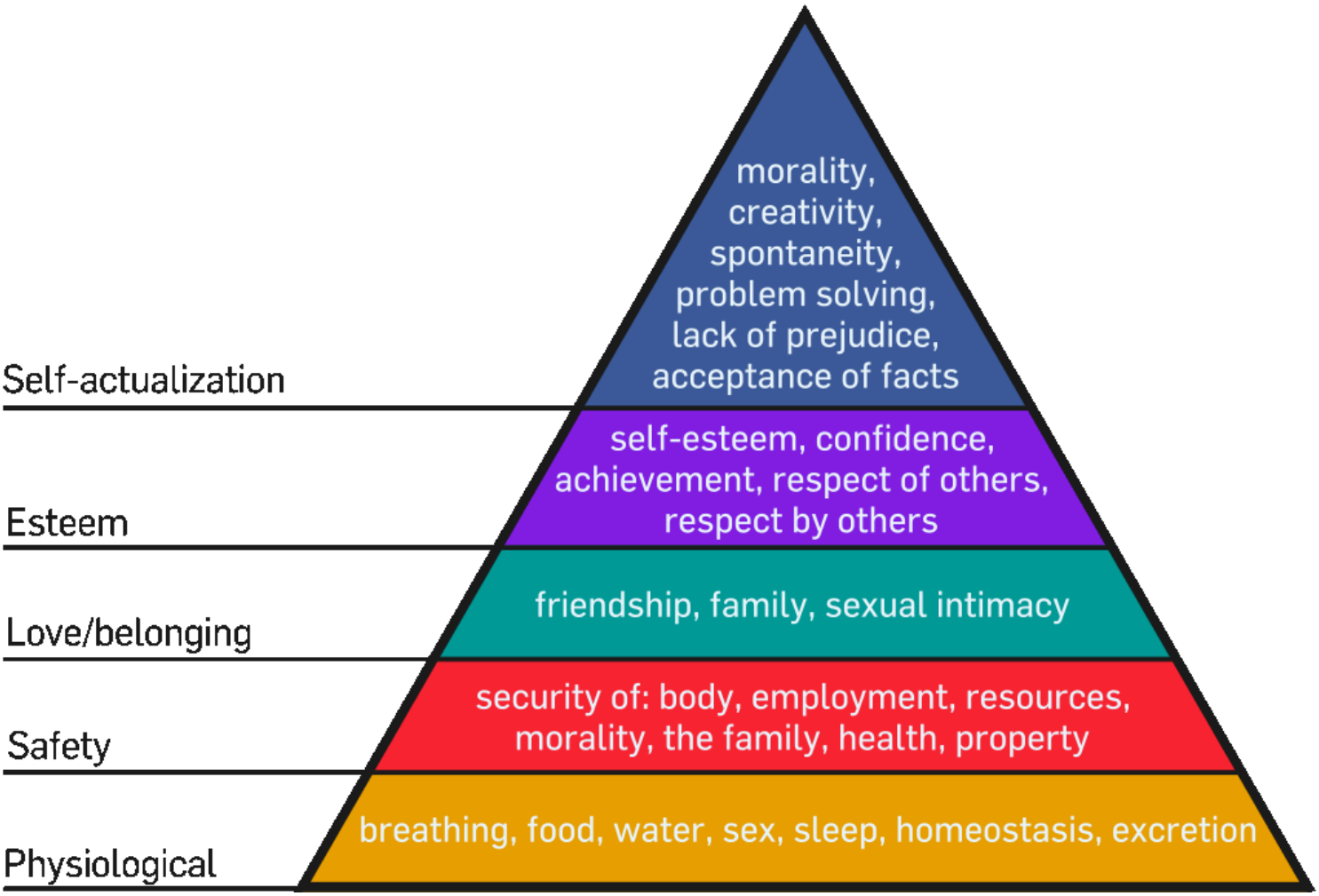
Motivation to Change

Essential to effective teaching is an understanding of why and how people learn. The field of psychology helps us understand what drives human behavior. Russian physiologist Ivan Pavlov demonstrated that behavior may be based on a conditioned response of reward or punishment. If a dog is always rewarded with a bone after a bell rings, the dog will begin to salivate upon hearing the bell. For a person with diabetes, being rewarded with a good blood glucose level after daily exercise can be encouraging and can help encourage repetition of the desired behavior. Unfortunately, however, the reward of comfort food may overpower the "punishment" of a rising blood glucose level.

If a patient is reprimanded by a healthcare professional for being overweight or having chronic hyperglycemia, the patient may stop returning to the doctor's office. Our behavior is determined by the promise/threat of reward or punishment. A teenage girl with type 1 diabetes may fear weight gain caused by insulin more than developing diabetic ketoacidosis and choose to go without her needed insulin after a meal. Identifying the predominant drive can help us understand the choices people make.

Cognitive learning theory states that people can learn logically and by social example; however, in eating we humans tend to be more emotional than rational. For example, a person may know (cognitive) that pasta elevates blood glucose more rapidly than a lean protein meal but still consume large amounts of pasta because it tastes so good (emotional). Abraham Maslow who developed **humanistic learning theory**, believes that what drives people to action, including learning and behavior change, is based on trying to fill the most urgent need at the time. His classic pyramid model demonstrates that the most primary human needs are survival, and only after having food, shelter, air, elimination of pain and waste, can we then focus on higher-level needs such as safety and security, social belonging, love and affection, and ultimately self-actualization.

Maslow's Hierarchy of Needs



Source: Maslow, 1943; image from Wikipedia Commons.

The person with diabetes who is suffering from painful neuropathy, erratic blood sugars, and retinopathy may not be interested in sitting in a class. He may be more focused on learning about behaviors that promise elimination of pain. Sometimes simply asking "What is the most important thing to you about learning to control your diabetes right now?" can help clarify the present drive to learn.

Adult learning theory identifies how adults learn and helps anyone who teaches adults to understand what motivates them. The following list identifies basic preferences of adult learners.

- Information is related to an immediate need.
- Learning is voluntary.
- Adults are problem- centered.
- Adults are self-controlled and self-directed.
- Learning is active.
- Threat to self is minimized.

- Learning is in a group.
- Adults prefer a variety of learning activities.
- Prompt feedback is given.

Teaching people of different ages requires different approaches. Adults generally prefer information that will help solve an immediate problem or need. Adults seek prompt feedback when learning a new skill and prefer a relationship where they are not threatened. Research shows that **the patient-provider relationship is crucial to adherence to a prescribed medical regimen** (Ciechanowski et al., 2001).

Adults who feel safe, valued, and free of judgment may be more compliant to a prescribed management plan than those adults who feel they are "just a number" or are being talked down to. Creating a collaborative relationship that includes the patient in diagnostic results and creating the health plan is beneficial in creating positive outcomes. The approach of teaching patients self- management that empowers them to take control of their own life produces powerful improvements in health outcomes (ADA, 2015.)

Diabetes self-management support (DSMS) is defined by the ADA as "support and education for the person with diabetes that facilitates the knowledge, skill, and ability necessary for diabetes self-care." The goal of any patient education needs to be to improve the health of the individual and reduce diabetes-associated complications. Historically, diabetes education and support has occurred primarily in hospitals and physicians' offices, however alternative settings such as clinics, community centers, homes, pharmacies, and home-based technology are now available and accessible.

Clinical Scenario

You are teaching a man who has type 2 diabetes about his blood glucose meter and his wife continually interrupts to ask questions about food and meals.

Q: What is the best course of action for you as the diabetes educator?

A: According to adult learning theory, you need to address her pressing need for information. Allow her to ask the questions and answer them. Continue with your demonstration when she feels her questions have been answered. It is still polite to remind her your time is limited and the goal of this session is to teach them how to use the meter. Using the meter can help them both identify the effects of the meals on blood sugar.

Helpful Educational Models

Sometimes we look at educational models and assume they are meant for academics but are not relevant to our daily teaching. Consider the models that follow and what they may contribute as you teach your patients about diabetes self-care.

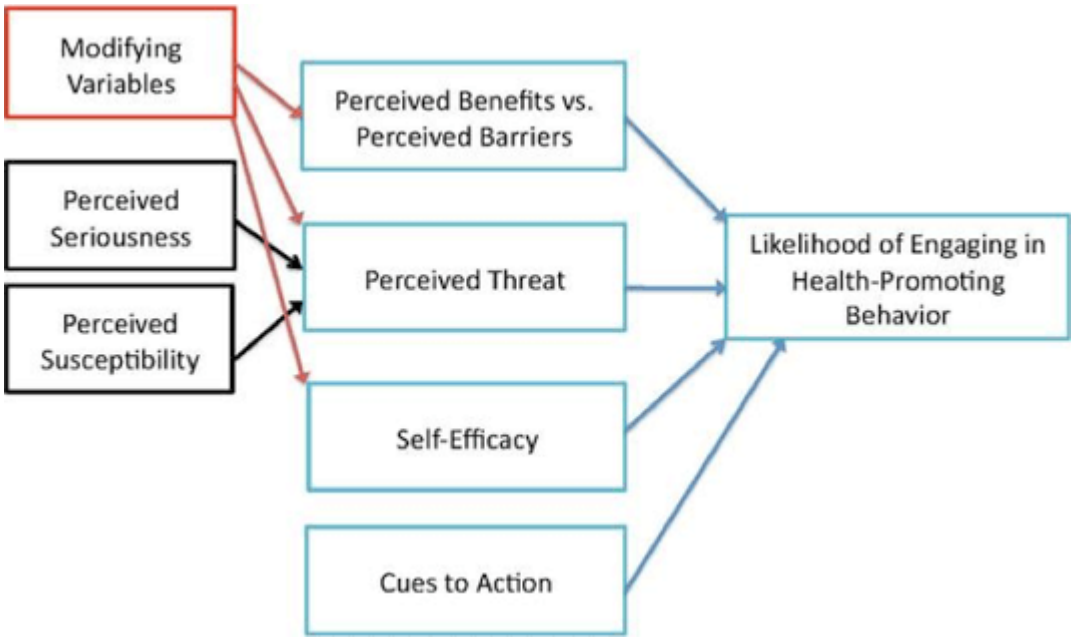
Health Belief Model

In addition to the learning theories, the Health Belief Model is a psychological model that can help you understand and predict health behaviors (*J Pharm Prac,* 2015). It can also help you to understand resistance to changing positive self-care behaviors. The model identifies factors that can either help or prevent someone from likely engaging in health-promoting behavior. If patients don't view their health condition as serious or see that they are truly susceptible, they generally won't take any action.

The way patients perceive self-care actions as benefits or barriers determines what they do. Even if patients acknowledge the seriousness of their condition and the benefits to behavior change, when there are barriers to the action or they don't believe they are capable of doing the behaviors, the actions won't occur.

The Health Belief Model is based on the patient's perception and not necessarily on reality. Many patients continue in denial and thus don't take action toward positive behaviors that will support their health. By addressing patients' perceptions of their diagnosis, potential or real consequences from the medical condition, and barriers to performing self-care behaviors, you will have greater success in teaching.

The Health Belief Model



Source: Ontario Health Promotion System, 2015.

The gap between theory and practice closes as you understand the theories that explain human behavior and begin to adjust the way you teach your patients about diabetes. Teaching someone about the dangers of chronic hyperglycemia without asking if they have a glucose monitor and know how to adjust their own behaviors creates a barrier they won't be able to overcome—and will not produce favorable glycosylated hemoglobin test results.

Teaching someone about the action of metformin and the need to take it twice daily won't be successful if the person can't afford the medication or doesn't believe in the benefits of Western medicine. The theories and models can help you as you try to identify why a patient doesn't follow prescribed medication use or behaviors. Rather than labeling a patient as "noncompliant," try to identify the barriers to that desired behavior with the patient and create solutions together.

Clinical Scenario

Thalia Smith, a 21-year-old female with type 1 diabetes, continues to have repeated admissions to the emergency department in DKA due to inconsistency with her insulin injections.

Q: What are questions you could ask to identify the cause of her behavior?

A: What does she understand about diabetes and insulin? What are her barriers to taking insulin? Is there a cost barrier? Is she afraid of weight gain? Does she have insurance? Is she living on her own now that she is 21? Does she see a benefit to taking insulin? What is her understanding of complications from chronic hyperglycemia? Does she just have diabetes burnout?

Transtheoretical Model

Assuming the patient has been taught effectively, there are different levels of behavior change that need to be understood and acknowledged. Change is difficult, and most people are inherently resistant to change. According to the Transtheoretical Model of change, concepts from the other theories are applied to help us understand the various stages of modifying behavior (Prochaska & Prochaska, 2011). Studies show that when people try to change their behavior they move through a series of stages. The time within the stages is variable; however, progress to action and maintenance of a behavior change must follow stage by stage in a systematic manner. The process is also cyclical, in that people can slip back into earlier stages with relapse and hopeful renewal.

Think about your success regarding a New Year's goal you set this year. Did you achieve it and stay in the ideal state of change or did your progress vary, relapse, and continue at various stages? Knowing about the various stages can help you assess and support the stage of change your patient may be in.

In the **precontemplation** stage a person hasn't begun to take any thought or action toward a goal. Research states that it takes on average ten times for a healthcare professional to discuss a new behavior, such as smoking cessation, before the person begins to truly think about it. In precontemplation the action hasn't even been seriously considered.

Transtheoretical Model

The next stage of **contemplation** is when the person begins to think seriously about changing a behavior. "Someday I'll really stop smoking." The third stage of preparation is when the person begins to think about all that is needed to make the change—for example, looking into available smoking cessation resources.

The next stage is **action,** when the person begins to make changes (throwing out cigarettes, joining a smoking cessation class, making an appointment to see his provider for a nicotine replacement product). According to research on behavior change, the action stage needs to occur more than 21 consecutive days to become habit. Once the new behavior has been continued for over a month, the new habit moves to the maintenance stage, which can take months or years. Relapse has been built into this model, as it recognizes human nature's tendency to fall back into old habits. Acknowledging that change is hard and requires support, you can shore up continued efforts. Sometimes, the relapse may be so severe that the person has to begin the entire cycle anew, starting with precontemplation to decide if the effort was worth it.

Ruler Method of Change

A tool to help guide your patient change is called the **ruler method**. After patients identify a desired area of improvement, such as ideal weight, ask them:

- On a scale of 1 to 10, where do you think you are in this?
- How much do you want the new behavior or outcome?

Using the 1 to 10 scale, follow up with questions to help identify barriers and motivation:

- How ready are you to make that change?
- How confident are you to make that change?
- What would it take for you to move up 2 points from where you are now?

The ruler method can help identify patients' level of change, barriers, and motivation. As the healthcare professional you don't have to lecture or nag, but merely ask good questions to guide their own self-reflection and discovery. The burden is no longer on the diabetes educator but on the patient to explore their own readiness to change and improve health behaviors. The educator is there to answer any questions the patient may have and to guide the discussion.

The following table demonstrates what you can do to support your patients as they develop new healthy behaviors.

Stage of change	Strategy
Precontemplation (resistance/reluctance)	Establish rapport, ask permission to help Build trust, express concern
Contemplation (considering)	Strengthen self-confidence
Preparation	Clarify short-term goals, resolve concerns
Action	Assist and support
Maintenance	Affirm, support, explore long-range goals

Kübler-Ross Grieving Model

Another model pertinent to people with diabetes is the **grieving model**, as identified by Dr. Elizabeth Kübler-Ross (Pera et al., 2008). Each person diagnosed with diabetes experiences the loss of their former good health and goes through stages of grief similar to those of death and dying. Essentially, their old healthy self is now seen as lost. The stages vary in timing and duration and often follow the sequence of denial, anger, bargaining, depression, and acceptance.

Patients who are in the denial phase don't make progress toward controlled blood sugar levels if they don't believe they have diabetes and need the medication. Many people with prediabetes or metabolic syndrome deny they are at risk for diabetes and don't make changes, which later may result in pancreatic fatigue, diabetes mellitus, and complications of chronic hyperglycemia. Patients may be in the anger or depression stage and not come to an acceptance of the reality of their disease, which delays improvement and glucose control. Recognizing the stages of valid grief can help you become a more compassionate diabetes educator. Remember, unless you have lived with diabetes yourself, you truly don't know what it's like, and compassion and support are some of the best medicines needed by your patients who have diabetes.

Clinical Scenario

Isaiah Brown, a 58-year-old African American man, is resistant to testing his blood sugar daily.

Q: What questions could you ask him to help him move to the next stage of action?

A: Tell me your concerns about testing your blood sugar. What gets in the way when you think of testing your blood sugar? What do you think may happen if you continue to have high blood sugar every day? What are some benefits of testing your blood sugar daily? How many times do you think you need to test your blood sugar? What would you do if you tested and had a high or low blood sugar?

Pragmatic Guidelines

Armed with an understanding of diabetes and what motivates people to change, it is necessary to know how to teach effectively in order to help patients achieve favorable outcomes. The determinants of learning can be addressed by answering the who, what, when, where, and how of teaching people with diabetes (Redman, 2004).

Who, What, Where, When, and Why

The **who** includes who you are teaching and, hopefully, family members. Parents of children with type 1 diabetes especially need education and support. Although there is no actual type 3 classification of diabetes, family members who care for a patient with diabetes have coined the term for themselves. Their lives are touched directly as they care for a family member with diabetes even though they don't have diabetes themselves. It is important to involve the family members who may be buying and preparing food and/or administering medication. There is a very real phenomenon of diabetes burnout, and caregivers also experience this and need support.

Deciding **what** needs to be taught may be easy if it is prescribed—such education for insulin injection or blood glucose monitoring—however, most topics are up to the diabetes educator. You must decide between the nice-to-know and the need-to-know. Because formal diabetes education may be limited by insurance companies to a maximum of ten hours in the first year, teach first survival skills such as basic physiology and medication administration. Long-term goals and special topics such as eating during the holidays, travel, and cooking ideas should be chosen after essentials such as weight loss and blood glucose monitoring. All topics must be in accordance with the ADA national standards for DSME.

Topics such as the use of alternative therapies should be limited if there is no position statement from the ADA. For example, patients will want to know if they should be taking cinnamon pills or chromium or cactus pear because they read about it on the Internet or heard it from a friend. Unless the ADA has endorsed such products, you need to tell the patient that they are not approved. Patients will highly value your opinion as a healthcare professional so you must be careful what you say about vitamins, complementary therapies, and practices not validated by evidence-based medicine.

Stay with the seven approved topics and interventions for diabetes management:

- Weight loss
- Medications
- Diet
- Exercise
- Monitoring
- Mental health and stress management
- Self- management strategies
- Avoidance of complications

A simple way to remember this are the "seven daily MnMs," which include:

M Mass reduction (weight loss)
M Movement (exercise)
M Meal Planning (diet)
M Monitoring (blood glucose, weight, lipids, blood pressure, etc)
M Medications
N No complications (avoiding hypoglycemia, DKA and HKS)
M Mental Health

Make sure your patient understands you are not advocating eating M&Ms to manage their diabetes! Once you know this is understood, the seven daily MnMs is a "sweet" way to remember the daily strategies recommended by the ADA to control daily blood glucose levels and overall diabetes. The use of mnemonics and acrostics help some people remember action items.

How to teach is grounded in understanding basic principles of teaching. As mentioned earlier in this module, you can ASSURE effective teaching by analyzing the learner's unique needs, stating the objectives for a teaching session, selecting appropriate teaching methods, using effective instructional materials, requiring learner performance, and then evaluating the learning.

Where diabetes education takes place includes both healthcare settings and non-healthcare settings such as the home. Because time and insurance coverage may limit the formal teaching, referring patients to public libraries, community support groups, the Internet, and diabetes organizations can expand their learning resources.

When diabetes education can begin depends on the physical and emotional readiness of the learner. Acute settings such as an emergency department may not be ideal for diabetes education, especially when the patient is in pain or discomfort; however, initial seeds may be planted as patients become newly motivated to avoid acute diabetic emergencies. Other factors that may impact a patient's readiness to learn include their state of fear, open vs. closed dialog, sense of safety or perceived threat to self, and discussing realistic or unrealistic goals. Telling an obese patient to lose 20 pounds may be unrealistic and overwhelming to the patient and close the patient off to any future discussions. Discovering what is of most interest to the patient is key. Discussing erectile dysfunction may actually become the right motivator to get a man interested in testing his blood sugar.

Just as children want to know the "why" of parental rules, many people with diabetes want to know why they are being given certain medications and prescriptions. Again, being able to explain the pathophysiology to them in a manner they understand can help them make connections with the prescribed regimen. The overall goal of diabetes self-management education is to help patients live as full and healthy a life as possible within their limitations.

One overarching strategy to achieve this is through controlling chronic hyperglycemia. Once patients understand the overall goal, monitoring their blood sugar levels throughout the day can give them feedback on the effects of exercise and food on their body. The goal is self-management, and information is key to being able to make adjustments. Blood glucose monitoring or insulin is no longer the enemy, but rather the tool to help them achieve better health.

How to teach effectively has been the overall question this continuing education course attempts to answer. Strategies discussed have included:

- Understand learning styles
- Understand learning principles for patients' ages

- Understand motivation and compliance factors
- Adjust teaching for cultural preferences
- Control flow of time and pacing
- Identify purpose of teaching session
- Require learner to take an action
- Organize the material
- Be prepared
- Have a sense of humor
- Be flexible and adjust the teaching as needed

General principles of effective teaching include being prepared with the material you may need. Give positive feedback and reinforcement rather than chastisement. Always demonstrate an attitude of respect and compassion. After teaching a concept, allow patients to rephrase it in their own words to evaluate understanding. Be flexible when the patient asks questions about a topic you may not have planned for. Sometimes a patient may ask general questions until gaining confidence in you and then the deeper questions of sexual dysfunction or eating disorders may surface.

Clinical Scenario

The diabetic patient refuses to test his blood sugar and states he can just guess his blood sugar by how he feels.

Q: What questions could you ask the patient to better help him?

A: Tell me how you feel when your blood sugar is high? When it is low? How do you know? What benefits are there in testing your blood sugar? What barriers do you have to testing your blood sugar? Do you have a meter? Would you like me to show you how to use it? Let me tell you about hypoglycemic unawareness.

Creating a Lesson Plan

Creating a plan for effective teaching begins with identifying the overall purpose of the teaching session. Writing your plan down helps focus on the overall goal and the topic for learning. What are the learning objectives you want your patient to achieve? Outline the related content to identify the topics you will need to cover, including the realistic time it will take to cover the material. Choose the materials and instructional resources you will use and how you will evaluate the learning.

The following table shows how you may outline a simple lesson plan to teach about blood glucose monitoring.

Topic	Content	Time	Materials	Evaluation
Blood glucose monitoring	a. What is it? b. Why do it? c. How to use the monitor d. How to record results e. How to interpret results	a. 2 min b. 2 min c. 10 min d. 5 min e. 5 min	Get monitor w/instruction manual Get log book	Demonstrate first and have patient give return demonstration of meter use and record in log book

Even though your lesson plan was perfectly organized and delivered, the patient may have a less than impressive retention or understanding of the information you presented. There are many factors that influence learning. Environmental elements may affect the learning experience (eg, temperature, noise). If the environment isn't conducive to learning, you may need to reschedule or return at a different time. Simply ask your patient "Is this a good time for you to discuss this?"

Emotional elements impact learning (eg, depression, readiness for change, fear). A patient who is anxious while waiting for a test result may not be ready for a lecture on weight loss. Social issues such as family dynamics can impact learning. Support or lack of support from family members or loved ones can change the learning experience. A man who doesn't feel supported by his wife may reject a learning session and stay in denial or anger. Physical condition can impact patients' learning if they are in pain or tired. It's generally not a positive experience to try to teach someone who is waiting for a pain medication or who keeps falling asleep from anesthesia. Ideally the planets will align and make all the elements perfect while you have the opportunity to teach about diabetes; however, reality is that you probably will need to teach in small segments of time based on the patient's preference and not your own schedule.

Even cultural values impact the learning experience. While teaching a Spanish-speaking woman about diabetes, a bilingual nurse was surprised when the patient stated "*Si Dios quiere"* (If God wants it) when asked "Would you like to learn more about how to monitor your blood sugar?" Even though there wasn't a language barrier, the deeper barrier was the belief system of the patient that God is in charge and she had no power to control her blood sugar levels. When confronted with a wall of resistance, endeavor to identify the barriers you are facing.

Other special considerations are patients with low literacy, attention deficit disorder, or mental illness. For more effective teaching with these persons consider the following strategies:

- Personalize all messages.
- Repetition is key.
- Use concrete illustrations.
- Allow hands-on learning.
- Be sensitive to word usage.
- Identify family members to assist.
- Word check for readability.
- Provide education in short time segments.
- Identify 1 to 2 main messages.
- Allow patients to teach back to clarify understanding.

Teaching all there is to know about diabetes is a daunting task—and unrealistic. Being able to connect your patient with reputable resources supports the patient's ability to become a lifelong learner with diabetes. Self-management education means you do not have to be the sole person to educate about diabetes, which is a relief. Look at the Resources at the end of this course for many options for you and your patient.

Maria

You are an RN working in a women's clinic when 24-year-old Maria arrives for her regularly scheduled obstetric appointment. She is 5'3" and weighs 153 pounds, with her pre-pregnancy BMI 29. She is a 26-weeks' gestation primigravida and speaks basic conversational English. She is scheduled to complete her 50-g glucose challenge. Her mother has diabetes.

Q: What is the purpose of the 50-g glucose challenge?

It is a screening test for diabetes and identifies how much sugar the body can metabolize after two hours of a glucose load.

1. What is the process of the screening test?

The patient needs to fast for at least 8 hours. The patient drinks a bottle of 50 grams of pure glucose. Blood glucose values are measured before the beverage is consumed, at the half-hour, 1-hour, and 2-hour mark. If the blood glucose remains above 140 mg/dL, the person has diabetes.

2. The results came back 201 mg/dl after 1 hour. What does this mean?

This patient has diabetes and her body cannot metabolize the sugar adequately.

Maria was then scheduled for a 100-g glucose load. The lab tests are shown in the following table.

Time of test	Patient value	Normal value
Fasting	131 mg/dl	<95 mg/dl
1 hour	193 mg/dl	<180 mg/dl
2 hour	182 mg/dl	< 155 mg/dl
3 hour	151 mg/dl	< 140 mg/dl

4. List at least three risk factors that predispose Maria for gestational diabetes mellitus (GDM).

She is Hispanic, overweight, and has a family history of diabetes.

5. You now give Maria nutrition guidelines for her GDM. She gives a diet history mainly of rice and beans, fried meats, and tortillas. She tells you her grandmother in Mexico had diabetes and cured it with *nopales* (prickly pear) and cinnamon. She says she gets nauseated with dairy products. What are your dietary goals for Maria?

Support her nutritional needs during the pregnancy. This is not a time for weight loss. Provide her a realistic diet plan based on her dietary and cultural preferences and provide calcium in forms other than dairy.

6. What survival skills that you will teach Maria this first session?

She needs to learn how to measure her blood glucose and how to create a realistic diet plan she can follow during the pregnancy.

7. Maria returns in 4 weeks and has gained 10 pounds. Her FBG today in the clinic is 238. You now instruct her to measure her FBG and 2 hours after eating twice daily. What type of monitor would you suggest for Maria? What is your approach for education at this visit? What resources do you have for her?

She needs a simple monitor. She also needs education in Spanish. Refer to the ADA for Spanish videos and pamphlets.

8. What are the potential complications for GDM to both Maria and her baby?

She could continue to gain excess weight and create complications for herself and the baby. With excess blood glucose the baby may grow too much and make a vaginal birth difficult (eg, a baby >9 lb). She is at greater risk of developing diabetes mellitus.

9. When she comes 1 week later you will teach her insulin injections TID. What are your teaching approaches and considerations?

She needs to understand why she will be taking insulin and that it will help her baby grow normally. She needs to know how/where she can get supplies and how she can afford them.

10. During the next months, she will return to the clinic every 4 weeks. What are other topics you will assess and teach her?

She needs to learn about fetal kick counts and plan for a safe delivery. She also needs to begin to think about weight loss after the delivery to avoid fully getting diabetes type 2 after her gestational diabetes.

11. In preparation for her labor, she wants to know if she will be on insulin for the rest of her life like her mother. What pre- and postpartum counsel do you have for her?

Explain to her how the pathophysiology of gestational diabetes compares to type 1 and type 2. Assess what kind of diabetes her mother had. Explain that she will have her blood sugar tested after delivery and may not need to be on insulin anymore.

Frank

Frank comes to the clinic where you are employed. He has been complaining of chronic fatigue, increased thirst, constant hunger, and frequent urination. He denies any pain or burning on urination. He admits to smoking since losing his job but has recently found a new job at a loan company. He also complains of having difficulty reading numbers and reports and making more mistakes in his paperwork.

He reports that his feet hurt as he stands at a bank teller station for many hours and so he sits and watches TV when he gets off work at night, not having enough energy to do anything else. His weight is 245, BP is 152/97, random BG is 291 mg/dl. His labs reveal the following: FBG=184 mg/dl, HgbA1C=10.4, negative for ketones on urine, cholesterol 256 mg/dl, triglycerides 346 mg/dl, LDL 158 mg/dl, HDL 32 mg/dl.

1. What is the probable diagnosis?

Type 2 diabetes mellitus.

2. What are his risk factors for this diagnosis?

Obesity, sedentary lifestyle, high lipids, hyperglycemia, ethnicity, age.

3. What are four methods of diagnosing this type of DM?

Fasting blood glucose >100 mg/dL, random BG >200 plus symptoms, A1C >5.5, OGTT >200 mg/dL.

4. Frank was started on lispro (Humalog) and glargine (Lantus) insulin with carb counting.

What is the most important point to make when teaching the patient about glargine?

Lispro is fast-acting and glargine is long-acting. They cannot be mixed together even though they are both clear in the vials.

5. Frank wants to know why he can’t take NPH and regular insulin. He has a friend who does.

Each body and type of diabetes requires different medication regimens and really can’t be compared to another person’s diabetes.

6. Frank is confused with counting carbs and says he doesn’t want to have to calculate foods. What are your options for teaching him meal planning?

He can use the plate method, portion control, food guide pyramid, or other food management systems.

7. What other complications does Frank have with his diabetes? What questions would you ask to assess other complications?

It appears he is already developing retinopathy, neuropathy, lipodystrophies, and possible cardiovascular complications.

8. What are some changes Frank can make to reduce the risk or slow the progression of both microvascular and macrovascular disease?

The seven self-management strategies endorsed by the ADA.

Interpret the following record of his visits and list your treatment suggestions.

Tests and other services	Dates and results		
Flu shot	9/28/00		
Urine protein or microalbumin (mg)	*2/1/15* *40*	*6/11/15* *38*	*9/28/15* *35*
Creatinine	*1.0*	*1.0*	*.8*
Total Cholesterol (mg/dL)	*256*	*225*	*199*
HDL cholesterol (mg/dL)	*32*	*35*	*40*
LDL cholesterol (mg/dL)	*146*	*140*	*135*
Triglycerides (mg/dL)	*250*	*240*	*228*
Tobacco use	*5 cigars a day*	*2 cigars*	*0*
Eye exam (dilated)	*10/1/00*	*10/4/2001*	*10/20/2002*
Foot exam	*ulcer*	*ulcer*	*healing ulcer*

1. Interpret the following blood glucose log book. What are your recommendations?

	Insulin Type	Breakfast		Lunch		Dinner	
		Dose	Blood Sugar	Dose	Blood Sugar	Dose	Blood Sugar
Mon	Reg NPH	8 20	141	3	287	4	158
Tue	Reg NPH	8 20	112	2	204	4	215
Wed	Reg NPH	8 20	159	3	178	4	261
Thur	Reg NPH	8 20	191	2	114	4	110
Fri	Reg NPH	8 20	132	2	152	3	68
Sat	Reg NPH	8 20	124	3	161	4	118
Sun	Reg	9	175	2	99	4	110

The fasting blood sugars are still higher than the recommended 110 mg/dL and the patient may need to take p.m. insulin or decrease carbohydrate consumption at dinnertime.

Mr. Brown

Mr. Brown is a 59-year-old African American male. He and his wife have grown children and he works as a manager of a mechanic shop, which he states is very stressful. He has had type 2 diabetes for fourteen years, which has been "controlled by a pill" (metformin). He was put on insulin three years ago: Humalog 75/25 pen at breakfast and Lantus at bedtime. He is afraid of hypoglycemia because at work he had one episode when he felt sweaty and shaky and had to lie down. His last eye examination revealed a few microaneuysms and he was diagnosed with mild nonproliferative retinopathy in both eyes. He checks his fasting blood glucose most days and occasionally before bedtime. He complains that the test strips are expensive so he will just let the doctor do the lab tests once a year. He doesn't keep a log book because he states his meter has a memory. He is in the office today because he's inquiring about Viagra.

1. From this brief history, what are your priorities of teaching with Mr. Brown?

Blood glucose testing with a monitor and teaching him how to avoid and identify hypoglycemic episodes.

2. Interpret his 24-hour food recall and explain your suggestions for improvement.

Breakfast	7 a.m.	2 cups Starbucks coffee 2 donuts
Mid morning	10 a.m.	Chips Orange juice
Lunch	1 p.m.	Double cheeseburger Large fries Diet Coke
Mid afternoon	3 p.m.	Apple, soda
Dinner	6:30 p.m.	Green salad with ranch dressing 2 rolls w/butter 1 pork chop w/gravy collard greens 1 slice chocolate cake 1 beer
Bedtime snack	10 p.m.	cookies

He needs to cut out excess sugar consumption, such as the soda and cookies and desserts, until he gets his blood glucose levels stabilized. He needs to include lean protein in his diet and more vegetables.

3. After committing him to monitor his blood glucose for 1 week he shows you the following log book. Interpret the findings and make your recommendations.

Date	Breakfast		Lunch		Dinner		Bedtime		Other		Comments
	Time	Blood Glucose	Time	Blood Glucose	Time	Blood Glucose	Time	Blood Glucose	Time	Blood Glucose	
1/30	7:00	205	12:00	158	5:00	198	10:30	215	3:30p	250	Felt tired & some blurred vision, mid afternoon
1/31	7:30	220	11:30	178	5:30	190	11:30	175			Tried to eat smaller portions at dinner
2/01	7:00	172	11:30	142	5:30	185	11:00	170			Felt better today!

His morning fasting blood glucose values are still too high and needs p.m. medication or a.m. coverage. He does well for lunch testing so his breakfast meal is OK.

4. Discuss the following info for Mr. Brown and list your recommendations.

	Initial visit	3 month F/U	6 month F/U	9 month F/U	Norm
Weight	226	220	224	221	180
BP	132/84	128/82	144/88	134/80	120/70
A1C	11.3	10.9	11.1	9.6	4–6
Monofilament foot check	Decreased sensation bilaterally	Decreased sensation in toe	Decreased sensation in toe	Decreased sensation in toe	Improving sensation bilaterally in feet
FBG	216	182	190	178	<110
Cholesterol	216	201	200	195	<200mg/dl
HDL	35	40	39	38	>40 mg/dl
LDL	116	110	112	102	<100 mg/dl
Triglycerides	300	293	306	288	<150 mg/dl
Creatinine	.9	.8	.9	.7	0.5-1.4 mg/dl
Microalbumin	34	30	35	32	<30 mg/g

5. Where is Mr. Brown making progress? What areas can he improve on?

He is losing weight. His blood pressure is improving, his FBG is better and he must surely be feeling better. He deserves congratulations. He can continue to watch his feet for wounds and healing. Be sure to engage with him on his initial question about using Viagra.

Resources and References

Resources

Professional Groups

American Association of Diabetes Educators (AADE)
www.diabeteseducator.org
800 338 3633

American Diabetes Association
www.diabetes.org
800 diabetes (800 342 2383)

American Dietetic Association
Eatright.org
800 877 1600

American Association of Clinical endocrinologists
www.aace.com

Juvenal Diabetes Research Foundation International
www.jdrf.org
800 533-CURE (800 533 2873)

Centers for Disease Control and Prevention
cdc.gov/diabetes
800 CDC-INFO (800 232 4636)

Diabetes Care
www.diabetescare.org

National Diabetes Education Program
www.ndep.nih.gov; www.yourdiabetesifo.org
888 693-ndep (6337)

National Diabetes Information Clearinghouse
diabetes.niddk.nih.gov
800 860 8747

National Diabetes Education Initiative
www.ndei.org

National Institute of Diabetes and Digestive and Kidney Diseases
http://diabetes.niddk.nih.gov/dm/pubs/dictionary/index.htm

Books

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Post Test

Use the answer sheet following the test to record your answers.

1. Glycogen:

    a. Is glucose when it is stored in the liver.
    b. Is another spelling for glucagon.
    c. Is the same as glucagon.
    d. Is interchangeable with insulin.

2. The four classes of diabetes are:

    a. Type A, type B, type C, and gestational.
    b. Type 1, type 2, gestational, and "other."
    c. Gestational, childhood, adolescent, and adult.
    d. Class 1a, class 1b, class 2a, and "other."

3. Which class of diabetes has absolute insulin deficiency?:

    a. Prediabetes.
    b. Gestational diabetes.
    c. Class 1a diabetes.
    d. Type 1 diabetes.

4. One strategy for overcoming barriers to poor communication is:

    a. Look directly into the patient's eyes.
    b. Speak as loudly and clearly as possible.
    c. Simplify medical jargon.
    d. Repeat yourself until you are certain the patient is following you.

5. "When the student is ready, the teacher appears" may apply to reluctant diabetes patients. What strategy can you use with such patients?:

    a. Remind them that their PCP has mandated their training.
    b. Give them a note or pamphlet and your phone number.
    c. Pull together all your printed materials to send home with them.
    d. Point out how much other diabetes patients have benefited from the training.

6. The purpose of the ASSURE mnemonic is:

a. To remind you to appear assured as a teacher.
b. As a memory tool for your diabetes patient.
c. To make sure you remember all of your teaching aids.
d. As a reminder of steps to effective learner education.

7. Motivation to change may be based on a conditioned response to reward or punishment. Which one of the following is likely to result in compliance with a diabetes regimen?:

a. A reduced blood glucose level following daily exercise.
b. Running out of money for insulin at the end of the month.
c. Being scolded by the diabetes educator.
d. Gaining weight despite following the regimen pretty well.

8. The most successful way to gain patient compliance with a diabetes regimen is:

a. Behave formally and be the expert in the room.
b. Be informal and try to get the patient to like you.
c. Develop a collaborative relationship with the patient.
d. Insist on strict compliance from the outset or you will lose the patient's respect.

9. The Health Belief Model is useful in identifying barriers to compliance.:

a. True
b. False

10. The stages identified by the Transtheoretical Model are:

a. Novice, moderate, and expert.
b. Action, relapse, and reaction.
c. Inattention, interest, and concentration.
d. Precontemplation, contemplation, and action.

11. The Ruler Method of change uses a scale from:

a. A to Z.
b. One to ten.
c. Minus 1 to +5.
d. One to 100.

12. Elizabeth Kübler-Ross's On Death and Dying applies to diabetes patients in what way?:

    a. They get stuck in denial and fail to progress.

    b. They are in total disbelief about having diabetes and don't take their insulin.

    c. The newly diagnosed patient experiences a loss of health in a way similar to the five stages of dying.

    d. Most patients haven't read the book so it really doesn't apply.

13. The mnemonic MnMs applies to what?:

    a. Seven daily interventions for diabetes management.

    b. A reminder not to eat candy.

    c. Medication but no motivation.

    d. Make me no mnemonics.

14. Which of the following demonstrates progress toward a behavior goal?:

    a. MJ has read pamphlets about Diabetes.

    b. Sue monitors her blood glucose 3x per day.

    c. Mark can identify 4 foods that contain 15 gm carbs.

    d. Walter can describe hypoglycemic symptoms.

15. Changes in physical activity and problem-solving abilities are good indicators of:

    a. Long-term outcomes.

    b. Continuous quality improvement.

    c. Behavior change.

    d. Clinical improvement.

Answer Sheet

Diabetes: Teaching Patients Self-Care

Name (Please print your name): _____

Date: _____

Passing score is 80%

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

Course Evaluation

Please use this scale for your course evaluation. Items with asterisks * are required.

- 5 = Strongly agree
- 4 = Agree
- 3 = Neutral
- 2 = Disagree
- 1 = Strongly disagree

* Upon completion of the course, I was able to:

a. Explain the four classes of diabetes and how they differ from one another.

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

b. Discuss the ways you can motivate a diabetes patient using at least two of the education models presented here.

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

c. Be prepared to create a lesson plan for a patient, with the goal of achieving a specific new aspect of self-care.

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

* The author(s) are knowledgeable about the subject matter.

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

* The author(s) cited evidence that supported the material presented.

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

* This course contained no discriminatory or prejudicial language.

○ Yes ○ No

* The course was free of commercial bias and product promotion.

○ Yes ○ No

* As a result of what you have learned, do you intend to make any changes in your practice?

Yes No

If you answered Yes above, what changes do you intend to make? If you answered No, please explain why.

* Do you intend to return to ATrain for your ongoing CE needs?

- Yes, within the next 30 days.
- Yes, during my next renewal cycle.
- Maybe, not sure.
- No, I only needed this one course.

* Would you recommend ATrain Education to a friend, co-worker, or colleague?

- Yes, definitely.
- Possibly.
- No, not at this time.

* What is your overall satsfaction with this learning activity?

5 4 3 2 1

* Navigating the ATrain Education website was:

- Easy.
- Somewhat easy.
- Not at all easy.

* How long did it take you to complete this course, posttest, and course evaluation?

- 60 minutes (or more) per contact hour
- 50-59 minutes per contact hour

- ○ 40-49 minutes per contact hour
- ○ 30-39 minutes per contact hour
- ○ Less than 30 minutes per contact hour

I heard about ATrain Education from:

- ○ Government or Department of Health website.
- ○ State board or professional association.
- ○ Searching the Internet.
- ○ A friend.
- ○ An advertisement.
- ○ I am a returning customer.
- ○ My employer.
- ○ Other
- ○ Social Media (FB, Twitter, LinkedIn, etc)

Please let us know your age group to help us meet your professional needs.

- ○ 18 to 30
- ○ 31 to 45
- ○ 46+

I completed this course on:

- ○ My own or a friend's computer.
- ○ A computer at work.
- ○ A library computer.
- ○ A tablet.
- ○ A cellphone.

- ○ A paper copy of the course.

Please enter your comments or suggestions here: _____

_____

_____

_____

Registration Form

Please print and answer all of the following questions (* required).

* Name: _____

* Email: _____

* Address: _____

* City: _____ * State: _____ * Zip: _____

* Country: _____

* Phone: _____

* Professional Credentials/Designations:

_____

Your name and credentials/designations will appear on your certificate.

* License Number and State: _____

* Please email my certificate:

○ Yes ○ No

(If you request an email certificate we will not send a copy of the certificate by US Mail.)

Payment Options

You may pay by credit card or by check.
Fill out this section only if you are **paying by credit card.**
4 contact hours: $29

Credit card information

* Name: _____

Address (if different from above): _____

* City: _____ * State: _____ * Zip: _____

* Card type:

○ Visa ○ Master Card ○ American Express ○ Discover

* Card number: _____

* CVS#: _____

* Expiration date: _____