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CSE Style: Citations for Technical Writing

Chapter 17 Clear Targets

The Council of Science Editors has established two separate forms for citing sources in scientific writing. One is the **citation-sequence** system for writing in the applied sciences, such as chemistry, computer science, mathematics, physics, and the medicine sciences. This system uses numbers in the text rather than a name and year. The second style format is the **name-year** system for use in the biological and earth sciences. The elements discussed in this chapter will assist with the CSE documentation style for your research paper:

- Writing in-text citations using the citation-sequence or name-year sequence
- Preparing a References page
- Formatting a paper in CSE style

There are advantages and disadvantages to each system. The citation-sequence system saves space, and the numbers make minimal disruption to the reading of the text, yet this style seldom mentions names, so readers must refer to the bibliography for the names of authors.

Citation-Sequence

The original description (3) contained precise taxonomic detail that differed with recent studies (4–6).

Name-Year

The original description (Roberts 2014) contained precise taxonomic detail that differed with recent studies (McCormick 2012a, 2012b, and Tyson and others 2013).

The name-year system mentions authors' names in the text with the year to show timely application and historical perspective. Citations can

be deleted or added without difficulty. But a long string of citations in the text can be more disruptive than numbers. In truth, the decision is usually not yours to make. The individual disciplines in the sciences have adopted one form or the other, as shown in the chart below.

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17a Writing In-Text Citations Using the CSE Citation-Sequence System

This system employs numbers to identify sources. Use this style with these disciplines: chemistry, computer science, engineering, mathematics, physics, and the medical sciences (medicine, nursing, and general health). In simple terms, the system requires an in-text *number*, rather than the year, and a list of References that are numbered to correspond to the in-text citations.

After completing a list of references, assign a number to each entry. Use one of two methods for numbering the list: (1) arrange references in alphabetical order and number them consecutively (in which case the numbers will appear in random order in the text) or (2) number the references consecutively as you put them into your text, interrupting that order when entering references cited earlier.

The number serves as the key to the source, as numbered in the References. Conform to the following regulations:

1. Place the number within parentheses (1) or as a raised index numeral, like this.⁵ A name is not required and is even discouraged, so try to arrange your wording accordingly. Full information on the author and the work will be placed in the References list.

It is known (1) that the DNA concentration of a nucleus doubles during interphase.

A recent study (1) has raised interesting questions related to photosynthesis, some of which have been answered (2).

In particular, a recent study¹ has raised many interesting questions related to photosynthesis, some of which have been answered.²

2. If you include the authority's name, add the number after the name.

Additional testing by Cooper (3) included alterations in carbohydrate metabolism and changes in ascorbic acid incorporation into the cell and adjoining membranes.

3. If necessary, add specific data to the entry:

"The use of photosynthesis in this application is crucial to the environment" (Skelton,⁸ p 732).

The results of the respiration experiment published by Jones (3, Table 6, p 412) had been predicted earlier by Smith (5, Proposition 8).

17b Writing a References Page

Supply a list of references at the end of your paper. Number the entries to correspond to sources as you cite them in the text. An alternate method is to alphabetize the list and then number it. Label the list *References*. The form of the entries should follow the examples provided here.

Book

Provide a number and then list the author, title of the book, place of publication, publisher, year, and total number of pages (optional).

1. Gribbin J. Edwin Schrodinger and the quantum revolution. New York: Wiley; 2013. 336 p.

Article in a Journal

Provide a number and then list the author, the title of the article, the name of the journal, the year and month if necessary, volume number and issue number if necessary, and inclusive pages. The month or an issue number is necessary for any journal that is paged anew with each issue.

2. Busby JW, Smith TG, White KL, Strange SM. Climate change and insecurity: Mapping vulnerability in Africa. *Intl. Security* 2013;37(4): 132–172.

Online Articles and Other Electronic Publications

Add at the end of the citation an availability statement as well as the date you accessed the material. Use the form in number 4 for an article published online. Use the form in number 4 for a periodical article that has been reproduced online. Number 3 is online and number 4 is a printed journal [serial online].

3. Ben-Joseph EP. Do my kids need vaccines before traveling? [Internet]. 2013. [cited 2013 Oct 3]; Available from: <http://kidshealth.org/parent/question/safety/travel-vaccinations.html#cat20290>
4. Pérez-Gil J, Rodríguez-Concepción M. Metabolic plasticity for isoprenoid biosynthesis in bacteria. *Biochemical J.* [Internet] 2013 [cited 2013 Nov 18]; 452:19–25. Available from: <http://www.biochemj.org/bj/431/bj4310023.htm>.

Magazine or Newspaper Article

Add a specific date and, for newspapers, cite a section letter or number.

5. McGrath B. The white wall. *New Yorker* 2013 Apr 22: 80-95.

6. [Anonymous]. What are mesenchymal stem cells? Chattanooga Times Free Press 2013 Apr 28; Sect A:1.

Proceedings and Conference Presentations



For a sample of a “References” page using the number system, see pages 373–374.

After supplying a number, give the name of the author or editor, the title of the presentation, name of the conference, type of work (report, proceedings, proceedings online, etc.), name of the organization or society, the date of the conference, and the place. If found on the Internet, add the URL and the date you accessed the information.

7. Barbose G, Connelly P, Kenney R. The future of renewable energy. NCSL Energy, Transportation and Agriculture Committee: National Conference of State Legislatures [Internet]; 2013 May 2–4 [cited 2013 Sept 27]; Denver, CO. Available from <http://comm.ncsl.org/MeetingAgenda/tabid/193/s/2/mpid/63770312/Default.aspx>

17c Writing In-Text Citations with Name and Year

The CSE name-year style applies to these disciplines:

Agriculture
Astronomy
Geography

Anthropology
Biology
Geology

Archeology
Botany
Zoology

When writing research papers in accordance with the name-year system, conform to the following rules:

1. Place the year within parentheses immediately after the authority’s name:

Stroyka (2012) ascribes no species-specific behavior to man.

However, Adamson (2013) presents data that tend to be contradictory.

2. If you do not mention the authority’s name in your text, insert the name, year, and page numbers within the parentheses:

One source found some supporting evidence for a portion of the questionable data (Marson and Brown 2013, pp 23–32) through point bi-serial correlation techniques.

3. For two authors, employ both names in your text and in the parenthetical citation:

Torgerson and Andrews (2014)

or

(Torgerson and Andrews 2014)

For three or more authors, use the lead author's name with "and others" in the written text of the paper.

Note: CSE style prefers English terms and English abbreviations in the text, but use Latin words and abbreviations, such as *et al.* for in-text citations.

In the text: Torgerson and others (2014)

In the parenthetical citation: (Torgerson et al. 2014)

4. Use lowercase letters (a, b, c) to identify two or more works published in the same year by the same author—for example, "Thompson (2013a)" and "Thompson (2013b)." Then use "2013a" and "2013b" in your list of references.
5. If necessary, supply additional information:

Alretta (2009a, 2009b; cf. Thomas 2010, p 89) suggests an intercorrelation of these testing devices. But after multiple-group analysis, Welston (2013, esp. p 211) reached an opposite conclusion.

6. In the case of a reference to a specific page, separate the page number from the year with a comma and a space. Do not use a period after the "p."
 - a. A quotation or paraphrase in the middle of the sentence:

Jones stated, "These data of psychological development suggest that retarded adolescents are atypical in maturational growth" (2013, p 215), and Jones attached the data that were accumulated during the study.

- b. A quotation or paraphrase that falls at the end of a sentence:

Jones (2013) found that "these data of psychological development suggest that retarded adolescents are atypical in maturational growth" (p 215).

- c. A long quotation, indented with the tab key and set off from the text in a block (and therefore without quotation marks):

Tavares (2014) found the following:

Whenever these pathogenic organisms attack the human body and begin to multiply, the infection is set in motion. The host responds to this parasitic invasion with efforts to cleanse itself of the invading agents. When rejection efforts of the host become visible (fever, sneezing, congestion), the disease status exists. (pp 314–315)

7. Punctuate the citations according to the following stipulations:

- a. Use a comma followed by a space to separate citations of different references by the same author or authors in same-year or different-year references:

Supplemental studies (Johnson 2013a, 2013b, 2012) have shown . . .

Supplemental studies (Randolph and Roberts 2013, 2014) have shown . . .

- b. Use a comma to separate two authors of the same work.

(Ramirez and Montoya 2013)

Use commas with three or more authors:

(Smith, Jones, Thompson, and others 2012)

- c. Use a semicolon followed by a space to separate citations to different authors:

Supplemental studies (Smith 2012; Barfield 2011, 2013; Barfield and Smith 2013; Wallace 2014) have shown . . .

17d Using Name-Year with Bibliography Entries

Alphabetize the list and label it *References*. Double-space the entries and use hanging indention. When there are two to ten authors, all should be named in the reference listing. When there are eleven or more authors, the first ten are listed, followed by “and others.” If the author is anonymous, insert “[Anonymous].” Place the year immediately after the author’s name.

Article in a Journal

List the author, year, article title, journal title, volume number, and inclusive pages. Add an issue number for any journal that is paged anew with each issue.

Chesney, RW. 2013. The disappearance of diseases, conditions, and disorders of childhood. *J Pediatrics* 162(5): 903–905.

Book

List the author, year, title, place of publication, publisher, and total number of pages (optional).

Zhang Y, Wen F, Xiao M. 2013. *Quantum control of multi-wave mixing*. New York: Wiley. 430 p.

Online Articles and Other Electronic Publications

Add at the end of the citation an availability statement as well as the date you accessed the material.

[Anonymous]. 2013. Chemical Activity Barometer: Economic Growth Remains Slow. *Chem. Proc.* [Internet]. [cited 2014 Jan 14] Available from: <http://www.chemicalprocessing.com/industrynews/2013/chemical-activity-barometer-economic-growth-remains-slow/>

Journal Article Reprinted Online

Provide original publication data as well as the Internet address and the date you accessed the material.

Forte, A, Lampe, C. 2013. Defining, understanding and supporting open collaboration: Lessons from the literature [abstract]. *Am. Behav. Sci.* [Internet], [cited 2013 Aug 30]; 54(5). 535–547. Available from: <http://abs.sagepub.com/content/57/5/535>

Magazine and Newspaper Article

Add a specific date and, if listed, a section letter or number.

Gray C. [2013 May](#). Clear as a bell. *Smithsonian* 44(2): 58–59.

Bailey T. [2013 Apr 28](#). How many restaurants can Memphis support? The [Memphis] *Commercial Appeal* 1+.

Proceedings and Conference Publications

Give author, date, title of the presentation, name of conference, type of work (report, proceeding, proceedings online, etc.), name of the organization or society, and place of the conference. If found on the Internet, add the URL and the date of your access.

Samuels A, Fishman J, Williams P. 2012. Effective use of partnerships, tools, and coalitions to improve outreach [abstract online].

In: Abstracts: 2012 National Conference on Health Communication Marketing and Media [Internet]; 2012 Aug 7–9; Atlanta, GA.

[cited 2013 Feb 19]. Available from: <http://www.cdc.gov/nchcmm/pdf/2012nchcmmconferenceprogram.pdf>

Arranging the References List

The list of references should be placed in alphabetical order, as shown next.

References

Allender, TY. 2013 June. Analysis of perchlorates in water intended for human consumption. *Midwest Sci. Qtr.* 31(6): 47–49.

[Anonymous]. 2012. Final regulatory determination for perchlorate in drinking water [Internet]. Environmental Protection Agency. [cited 2013 Nov 8]. Available from: <http://water.epa.gov/drink/contaminants/unregulated/perchlorate.cfm>

[Anonymous]. 2012. Perchlorate in drinking water [Internet]. California Department of Health Services. [cited 2013 Nov 7]. Available from <http://www.cdph.ca.gov/certlic/drinkingwater/pages/Perchlorate.aspx>

Kemsley J. 2013 Apr 8. Archaea feed on perchlorate. *Chem. & Eng. News.* [Internet]. [cited 2013 Nov 8]; 91(14): 8. Available from: <http://cen.acs.org/articles/91/i14/Archaea-Feed-Perchlorate.html>

Zhang T, Wu Q, Sun HW, Rao J, Kannan K. 2010. Perchlorate and iodide in whole blood samples from infants, children, and adults in Nanchang, China. [abstract]. 44(18):6947–6953. *Chem. Engr. News.* [Internet]. [cited 2013 Nov 6]. Available from <http://pubs.acs.org/doi/abs/10.1021/es101354g>

Sample Paper Using the CSE Citation-Sequence System

Student Sarah Bemis has researched problems with managing diabetes and presented the paper using the CSE citation-sequence system. As she cites a source in the text, she uses a number that also reappears on her References page. Accordingly, the references are not in alphabetical order. As is standard with writing in the sciences, an abstract is provided.

Diabetes Management:
A Delicate Balance

Balance the
title, name,
and
affiliation.

By
Sarah E. Bemis

English 103: College Writing
Sister Winifred Morgan, O.P.

5 March 2013

Abstract

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An abstract
of 100–200
words states
the purpose,
scope, and
major
findings of
the report.

Diabetes affects approximately 11 million people in the U.S. alone, leading to \$350 billion in medical costs. Two types, I and II, have debilitating effects. The body may tolerate hyperglycemia for a short time, but severe complications can occur, such as arterioscleroses, heart disease, nerve damage, and cerebral diseases. New drugs continue to improve the lifestyle of a person with diabetes, but controlling blood sugar requires three elements working together—medication, diet, and exercise. This study examines the importance of each of the three. Patients need a controlled balance of the medication, diet, and exercise program.

Bemis 1

Diabetes Management: A Delicate Balance

Diabetes is a disease that affects approximately 11 million people in the United States alone (1), and its complications lead to hundreds of thousands of deaths per year and cost the nation billions in medical care for the direct cost of complications and for indirect costs of lost productivity related to the disease. The condition can produce devastating side effects and a multitude of chronic health problems. For this reason, it can be very frightening to those who do not understand the nature and treatment of the disease. Diabetes currently has no known cure, but it can be controlled. Diabetes research has made great advancements in recent years, but the most important insights into the management of this disease are those which seem the most simplistic. By instituting a healthy, balanced lifestyle, most persons with diabetes can live free of negative side effects.

Diabetes mellitus, according to several descriptions, is a disorder in which the body cannot properly metabolize glucose or sugar. The body's inability to produce or properly use insulin permits glucose to build up in the bloodstream. The excess sugar in the blood, or hyperglycemia, is what leads to the side effects of diabetes (2,3,4).

There are actually two types of diabetes. Type 1, or juvenile diabetes, is the name given to the condition in which the pancreas produces very little or no insulin. It is normally discovered during childhood, but can occur at any age (3). Adult onset, or Type II diabetes, occurs when the pancreas produces usable insulin, but not enough to counteract the amount of glucose in the blood. This often results from obesity or poor diet.

In both Type I and Type II diabetes, the problem has been identified as hyperglycemia (5). This buildup of glucose in the

Use a number to register the use of a source.

The thesis or hypothesis is expressed at the end of the introduction.

Scientific writing requires careful definition, as shown here.

More than one source can be listed for one idea or concept.

Bemis 2

bloodstream leads to a number of dangerous side effects. The initial effects and indicators of hyperglycemia are frequent urination, intense thirst, increased hunger and fatigue. When glucose begins to build up in the blood, the kidneys begin to filter out the excess sugar into the urine. The amount of glucose the kidneys can filter varies with each person. In this process, all the water in the body's tissues is being used to produce urine to flush glucose from the kidneys. This is what leads to the intense thirst and frequent urination associated with hyperglycemia (5).

Causal analysis, as shown here, is a staple of scientific writing.

Because the body lacks the insulin needed to allow glucose into the cells, the glucose cannot be processed to produce energy. The cells signal the brain that they are not getting sugar and this causes hunger. However, no matter how much a victim of hyperglycemic diabetes eats, the cells will not be producing energy (6).

It has been shown (4) that with hyperglycemia the kidneys try to compensate for the excess of sugar and lack of energy. While the kidneys attempt to filter the sugar from the blood, the liver tries to produce energy by burning fat and muscle to produce ketones, a protein that the body attempts to burn in place of glucose. Ketones do not provide the energy the body requires but do produce chemicals toxic to the body. When too many ketones are present in the blood, ketoacidosis occurs (4).

Refer to the sources with the past tense verb or the present participle.

In addition to the number, you may mention the name(s) of your sources.

Guthrie and Guthrie (1) have demonstrated that ketoacidosis is a condition caused by high levels of hydrogen in the blood. This leads initially to a high blood pH, depleted saline fluids and dehydration. If untreated it can lead to a shut down of the central nervous system, coma or even death. In fact, many diabetes-related deaths are caused by ketoacidosis that has reached a comatose state. Ketoacidosis is characterized by

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frequent urination, dry mouth, extreme thirst, headache, rapid and deep respiration, increased heart rate, nausea, vomiting, disorientation and lethargy (1).

The American Academy of Family Physicians (4) has reported that hyperglycemia can cause other, more subtle, side effects. Because the body is not receiving the nourishment it requires, a victim of hyperglycemic diabetes often experiences poor tissue growth and repair. This can cause problems with growth and development in children and wound healing in adults as well as children. It has also been reported (7) that the immune system is also affected and that victims experience infection more often and more severely than a person without diabetes. Other conditions that frequently occur in conjunction with hyperglycemia in its early stages are depression and chronic fatigue (8). Many patients who experience hypoglycemia have difficulties controlling gain and loss of weight as well.

It has been shown (Guthrie and Guthrie 1) that the body may tolerate hyperglycemia over a short time period. However, if untreated, it leads to other chronic and often fatal health conditions. Arteriosclerosis occurs in hyperglycemic diabetics over time, resulting in decreased circulation and eyesight. This also may lead to heart disease, angina and heart attack, the most prevalent causes of death among diabetics (1). Also common is diabetic neuropathy, a degeneration of the nerves. This condition causes pain and loss of function in the extremities (1).

A person with diabetes is also at risk for many cerebral diseases. Both the large and small cerebral arteries of victims are prone to rupture, which can cause cerebral hemorrhage, thrombosis or stroke. Blockages in the carotid arteries can decrease blood flow to the brain, causing episodes of lightheadedness and fainting (1, pp 201-202).

You may add page numbers to the reference as a courtesy to the reader.

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Diabetic nephropathy occurs when the kidneys are overloaded with glucose. Eventually, they begin to shut down. The kidneys of a person with uncontrolled diabetes are also susceptible to infection, resulting in decreased kidney function (1).

With all the complications victims experience, the outlook for a long and healthy life does not seem good for those diagnosed with the disease. However, all of these effects can be reduced, delayed, and even prevented with proper care and control. By monitoring blood sugar and reacting accordingly with medication, by special diets, and by exercise and a controlled lifestyle, persons with diabetes can avoid these serious health conditions (Hu and others 9).

The first aspect of diabetes care is blood sugar monitoring and medication. The two go hand in hand in that the patient must have the appropriate type and dosage of medication and must know blood sugar values and patterns in order to determine the correct regimen. Two main types of monitoring are necessary for diabetes control. Patients must perform home glucose monitoring on a daily basis. Advancements in this area in recent years have made this relatively effortless. Several glucose monitoring kits are available to the general public. These consist of a small, electronic machine that measures the amount of glucose in the blood, as well as the equipment necessary to obtain a small sample. With such equipment, patients can test and record blood sugars several times per day. This gives both short-term and long-term information by which they and their physicians can determine insulin dosages and meal plans.

In addition to daily monitoring, victims should visit their physician regularly. Doctors usually perform a test called a hemoglobin A1C, which gives a better indication of blood sugar control over a longer period of time than a home test. This

Process analysis, as shown here, is often a staple of scientific writing.

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should be done approximately every ninety days, as that is the time period over which blood cells are renewed. This test along with consideration of daily glucose values can help the physician determine overall control and effectiveness of the patient's routine. Regular visits also give the physician an opportunity to monitor the general health of the patient, including circulation, eyesight, infections, and organ infections.

The treatment of diabetes usually involves medication.

Since Type I diabetics produce very little or no insulin, insulin injections will always be necessary. For Type II, the treatment may be strictly dietary, dietary with oral hypoglycemic agents, or insulin therapy.

When insulin therapy is required, it is very important that the appropriate type and dosage is implemented. Many types of insulin are available. The main distinction among these types is in their action time, onset, peak-time, and duration. Different types of insulin begin to act at different rates. They also continue to act for different periods of time and hit peak effectiveness at different intervals (1). This is why it is important to have records of blood sugars at regular intervals over several weeks. From this it can be determined when and what type of insulin is needed most. Once it is determined what insulin regimen is appropriate, the patient must follow it closely. Routine is very important in controlling diabetes.

Patients with diabetes now have a few options when it comes to injection method. One may chose traditional manual injection, an injection aid, or an insulin pump. Injection aids can make using a needle easier and more comfortable or actually use air pressure to inject. The insulin pump is a device that offers convenience as well as improved control. The pump is a small battery-operated device that delivers insulin 24 hours a day through a small needle worn under the skin. The pump contains

The writer explores control element number one: methods of administering medication.

Bemis 6

a computer chip that controls the amount of insulin delivered according to the wearer's personalized plan (10). The pump is meant for patients who do not wish to perform multiple injections, but are willing to test blood sugars frequently. The pump can help patients who have some trouble controlling their blood sugars by providing insulin around the clock. It also provides an element of freedom for persons with busy schedules.

Some Type II patients can control the disease with a combination of diet, exercise and an oral hypoglycemic agent. These drugs themselves contain no insulin. They traditionally lower blood glucose levels by stimulating the pancreas to produce insulin (1). Therefore, they are only appropriate for patients whose pancreas is still producing some insulin. Diabetes research has advanced in recent years, however. Some new drugs are coming available in the new millennium. Creators of the pharmaceuticals are able to increase sensitivity to insulin and suppress the secretion of hormones that raise blood sugar. A number of new drugs that are aimed at taking the place of insulin therapy are currently in the final stages of research and development. Glucovance has been advanced as a valuable new medication (11). For now, the oral medications that are available can aid in keeping better control when properly paired with an effective diet and exercise plan.

While it is important to have the proper medication, the backbone of diabetes management is the meal plan. By making wise choices in eating, persons with diabetes can reduce stress on the body and increase the effectiveness of their medication. The basis of a good meal plan is balanced nutrition and moderation. Eating a low fat, low sodium, low sugar diet is the best way for a diabetic to ensure longevity and health. It is important for everyone to eat balanced meals on a routine schedule. For victims

The writer now explores control element number two: methods of diet management.

Bemis 7

of diabetes, it can help in blood sugar control and in preventing heart disease and digestive problems.

Two established meal plans are recommended for patients: the Exchange Plan and carbohydrate counting (12, 13). Both are based on the Diabetes Food Pyramid (Nutrition). The Food Pyramid divides food into six groups. These resemble the traditional four food groups, except that they are arranged in a pyramid in which the bottom, or largest, section contains the foods that should be eaten most each day. The top, or smallest, section contains the foods that should be eaten least, if at all. With any diabetic meal plan, the patient should eat a variety of foods from all the food groups, except the sweets, fats, and alcohol group. New directives by the American Diabetes Association offer helpful and authoritative guidance to help victims cope with their meal planning (14, 15).

The Exchange Plan provides a very structured meal plan. Foods are divided into eight categories, which are more specific than those of the Food Pyramid are. A dietician or physician determines a daily calorie range for the patient and, based on that range, decides how many servings she or he should eat from each category per meal. Portion sizes are determined and must be followed exactly. The patient then has the option to either choose foods that fit into the groups recommended for each meal or exchange foods from one group for foods from another.

Another meal plan patients can utilize is carbohydrate counting. This plan is less structured and gives the patient more flexibility in making meal choices. It also involves less planning. Once again, food is categorized, but into only three groups. The largest food group, carbohydrates, encompasses not only starches, but dairy products, fruits, and vegetables as well. The dietician or physician again assigns a calorie range. With this plan, however,

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only the number of carbohydrates per meal are assigned, and even this is flexible. This plan is recommended for those who know how to make balanced meal choices, but need to keep track of their food intake. Once again, portion sizes are important, and the patient must remember to eat the recommended amount of foods from each pyramid category (5, 11, 12).

The writer now explores control element number three: methods of exercise.

The final element in successfully managing diabetes is exercise. It has been shown (16) that exercise can help stimulate the body to use glucose for energy, thus taking it out of the blood. Diabetic patients need regular exercise programs that suit their personal needs. Something as simple as a walking routine can significantly reduce blood glucose levels (16). Some patients may require as little as a fifteen-minute per day walk, where some may need a more involved workout. In each case, an exercise schedule works with meal plans, medication, and lifestyle. Also crucial to the success of an exercise routine is close monitoring of blood sugar. If glucose levels are too high or too low, exercise will have negative effects.

All of the aspects of diabetes management can be summed up in one word: balance. Diabetes itself is caused by a lack of balance of insulin and glucose in the body. In order to restore that balance, a person with diabetes must juggle medication, monitoring, diet, and exercise. Managing diabetes is not an easy task, but a long and healthy life is very possible when the delicate balance is carefully maintained.

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References

1. Guthrie DW, Guthrie RA. Nursing management of diabetes mellitus. New York: Springer, 2008. 500 p.
2. [Anonymous]. Diabetes insipidus [Internet]. American Academy of Family Physicians. [cited 2013 Feb 20]. Available from <http://familydoctor.org/familydoctor/en/diseases-conditions/diabetes-insipidus/symptoms.html>.
3. Fowler, MJ. Diabetes treatment, part 1: Diet and exercise. *Clin Diabetes* 2007; 25(3): 105–109.
4. [Anonymous]. Diabetes: Monitoring your blood sugar level [Internet]. American Academy of Family Physicians. [cited 2013 Feb 22]. Available from <http://familydoctor.org/familydoctor/en/diseases-conditions/diabetes/treatment/monitoring-your-blood-sugar-level.html>
5. Peters AL. Conquering diabetes. New York: Penguin, 2006. 368 p.
6. Arangat AV, Gerich JE. Type 2 diabetes: postprandial hyperglycemia and increased cardiovascular risk. *Vasc. Health and Risk Manag.* 2010 Mar 6; 145–155.
7. Milchovich SK, Dunn-Long B. Diabetes mellitus. Boulder, CO: Bull, 2011. 240 p.
8. Davile A. Complications [Internet]. Diabetes Hands Foundation 2013. [cited 2013 Feb 21]. Available from <http://www.tudiabetes.org/notes/Complications>.
9. Hu FB, Li TY, Colditz GA, Willett WC, Manson JE. Television watching and other sedentary behaviors in relation to risk of obesity and type 2 diabetes mellitus in women. *JAMA* 2003; 289: 1785–1791.
10. [Anonymous]. Insulin pump therapy [Internet]. Children with Diabetes 2013. [cited 2013 Feb 24]. Available from <http://www.childrenwithdiabetes.com/pumps/>.
11. [Anonymous]. Glucophage [Internet]. Diabetes Healthsource. 2013. [cited 2013 Feb 28]. Available from <http://www.glucophage.com>.

Citations on this page demonstrate the citation-sequence method, as explained on pages 358–359. For details on the name-year system, see pages 361–363.

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12. McDermott MT. *Endocrine secrets*. New York: Elsevier, 2009. 448 p.
13. Bittencourt JA. *The power of carbohydrates, proteins, and lipids*. Charleston, SC: Createspace, 2011. 196 p.
14. American Diabetes Association. *The American Diabetes Association complete guide to diabetes*. Alexandria, VA: ADA, 2013. 576 p.
15. American Diabetes Association. *The diabetes comfort food cookbook*. Alexandria, VA: ADA, 2013. 192 p.
16. American Diabetes Association. *Ideas for exercise* [Internet]. American Diabetes Association 2013. [cited 2013 Feb 25]. Available from <http://www.diabetes.org/food-and-fitness/fitness/ideas-for-exercise/?loc=DropDownFF-exerciseideas>.