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ABSTRACT

Intended as a resource for individuals wishing to evaluate diabetes education programs, this handbook, one of a series of seven, provides a collection of measuring devices that can improve the quality of such evaluations. Chapter 1 introduces the handbook's contents and outlines evaluation related issues specific to diabetes education programs. Chapter 2 introduces the key operations involved in program evaluation, emphasizing the role of assessment instruments in the gathering of information needed for defensible evaluations. Chapter 3 contains the measuring tools designed to be used in the evaluation and design of diabetes education programs. These measures deal with behavior, knowledge, skills, and affective outcomes. Each measure is introduced by a brief description of the purpose of the assessment instrument, as well as procedures for administering, scoring, and analyzing the resulting data. Chapter 4 describes how technical appraisals of the handbook's measures can be carried out. The three appendices contain amplified content descriptors for updating the various measures, an explanation of informed consent procedures, and an annotated bibliography. (JD)

PROGRAM EVALUATION HANDBOOK:

Diabetes Education

PROGRAM EVALUATION HANDBOOK

DIABETES EDUCATION

Prepared for

The Center for Health Promotion and Education
United States Centers for Disease Control

The Office of Disease Prevention and Health Promotion
Office of the Assistant Secretary for Health
United States Department of Health and Human Services

by

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1988

TABLE OF CONTENTS

Preface

In recent years, health educators have increasingly recognized that systematic evaluation can help them appraise and improve their programs. For this potential to be realized, however, effective mechanisms for gathering relevant data are required. In the past, critical information about a program's effects was not collected in some instances because suitable measures for gauging those effects were lacking. The purpose of this handbook is to rectify, at least in part, this deficiency in the evaluation of diabetes education programs.

This book is one of seven health education evaluation handbooks resulting from a project jointly initiated in 1980 by the United States Centers for Disease Control (CDC) and the Office of Disease Prevention and Health Promotion (ODPHP) of the Office of the Assistant Secretary for Health. The handbook is not intended to be prescriptive or all-inclusive. Those who evaluate diabetes programs should regard the handbook as only a resource, that is, a collection of assessment tools that may be of use in program evaluation. The extent to which the handbook will actually be useful depends chiefly on the extent to which it contains assessment tools that correspond to the evaluation needs of a particular diabetes program.

Handbook Development

This handbook has been created by IOX Assessment Associates (IOX), selected competitively on the basis of responses to a governmentally issued request for proposals. IOX was to collect and develop program evaluation measures for critical behavior, knowledge, skill, and affective outcomes in the area of diabetes. Three panels of experts played prominent roles in the creation of this handbook. A **Handbook-Development Panel**, consisting of six experts familiar with diabetes programs or their evaluation, guided the initial development of the handbook. The Handbook-Development Panel identified important outcomes for diabetes programs. IOX staff, drawing on the advice of panelists, then developed assessment instruments to assess panel-identified program outcomes. The names and affiliations of the Diabetes Handbook-Development Panelists are provided on the following page.

Handbook-Development Panel

Ms. Elizabeth Bernheimer
University of Nevada
School of Medicine
Reno, Nevada

Dr. Stuart J. Cohen
Diabetes Research and
Training Center
Indiana University School of Medicine
Indianapolis, Indiana

Dr. Peter A. Cortese
California State University
Long Beach, California

Dr. Alan Drash
Children's Hospital
Pittsburgh, Pennsylvania

Dr. Ronald K. Hambleton
University of Massachusetts
Amherst, Massachusetts

Ms. Rita Nemchik
American Association of
Diabetes Educators
Pitman, New Jersey

The Handbook-Development Panel met at the beginning of the project in order to isolate the chief outcomes that diabetes programs could reasonably be expected to promote. Preliminary statements reflecting these outcomes were identified by the panelists. These preliminary outcome statements were refined by IOX staff and mailed to the panelists and other interested specialists, all of whom rated the importance of each statement. The list of high-priority outcomes that resulted was used to guide the selection and development of the original handbook's measures.

All newly developed measures were mailed to the panelists for review. In addition, all of these measures were tried out with small groups of respondents. The measures were revised based on the informal tryouts and the panelists' review comments. All of the new measures were also reviewed by IOX staff in an effort to eliminate any potential ethnic, gender, religious, or socioeconomic bias.

A completed version of the diabetes handbook was delivered to the government in 1983. Several thousand copies of the handbook were released by CDC and ODPHP to health educators throughout the nation.

Handbook Revision

Subsequent to the initial distribution of the handbook, CDC issued, in concert with ODPHP, a second request for proposals which led to the comprehensive revision of the existing diabetes handbook. To guide the review and revision of the diabetes handbook, a **Handbook-Revision Panel** was constituted. Members of the panel were selected because of their dual expertise in (a) the field of diabetes and (b) measurement of the outcomes sought by diabetes programs. Members of the Handbook-Revision Panel and their affiliations are listed on the following page.

Handbook-Revision Panel

Dr. Ronald Arky
Mount Auburn Hospital
Cambridge, Massachusetts

Dr. Wayne Davis
University of Michigan Medical School
Ann Arbor, Michigan

Dr. Roger Mazze
Albert Einstein College of Medicine
Bronx, New York

Dr. Leona Miller
Diabetes Center
Saint Vincent's Medical Center
Los Angeles, California

The Handbook-Revision Panel met on two occasions. In these meetings panelists reviewed the contents of the initial version of the diabetes handbook, particularly its measures, and suggested deletions, modifications, or additions. Panclists also provided guidance regarding ways of making the handbooks more usable to practitioners. During both of these meetings, the panelists were attentive to the accuracy of the handbook's contents. Considerable content, in the measures as well as the introductory materials, was revised or deleted on the basis of panelists' suggestions.

Overall Guidance

A third panel, the **Project Advisory Panel**, provided overall guidance to IOX staff during the final three years of the project. These individuals offered technical counsel and strategic advice during the revision of all handbooks. Members and affiliations of the Project Advisory Panel are listed below:

Project Advisory Panel

Dr. Peter A. Cortese
California State University
Long Beach, California

Dr. Jonathan E. Fielding
U.S. Corporate Health Management
and University of California
Los Angeles, California

Dr. Lawrence W. Green
Henry J. Kaiser Family Foundation
Menlo Park, California

Dr. William L. Haskell
Stanford University
Stanford, California

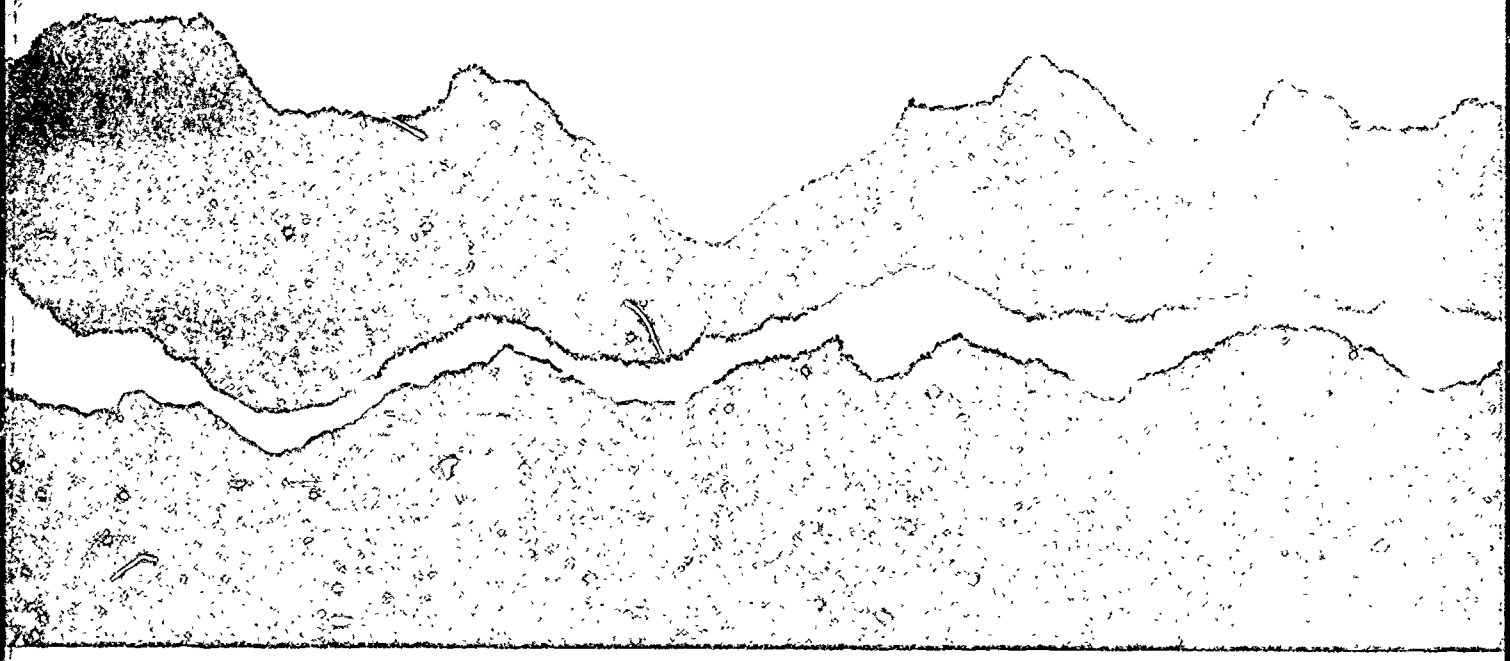
Acknowledgments

The project that led to the creation of this handbook was funded by the CDC and ODPHP. Dr. Walter J. Gunn of CDC conceptualized the project and supplied technical guidance throughout its first phase. During this time, Dr. Diane Orenstein of CDC, as well as Dr. Donald Iverson and Dr. Patricia Mullen, both of ODPHP, served as project officers.

During the project's second phase, that is, the revision of the handbook, Dr. Orenstein of CDC continued to serve as project officer along with Dr. Joel Kavet, Dr. Gregory Christenson, and Mr. James Harrell of ODPHP.

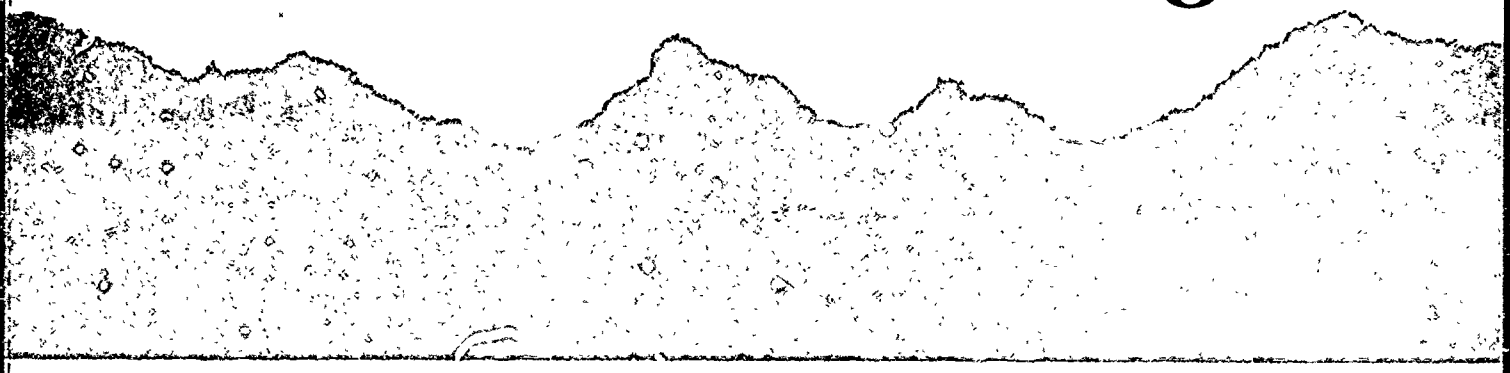
As the handbook progressed, numerous health educators throughout the nation offered their insights regarding the handbook's contents. Without their expert assistance, development of this volume would have been impossible.

IOX Assessment Associates
July, 1988



CHAPTER ONE

A Resource for the Evaluation of Diabetes Education Programs



A Resource for the Evaluation of Diabetes Education Programs

This handbook is intended to help those individuals who wish to evaluate diabetes education programs. More specifically, the handbook provides a series of measuring devices that, if selected and used judiciously, can improve the quality of such evaluations. As a consequence, not only will the technical quality of the program evaluation be improved, but any program-related decisions based on the evaluation's results are apt to be more defensible.

An Evidence-Oriented Era

In recent years educators have experienced substantially increased pressures to produce evidence that their programs are functioning effectively. In contrast to an earlier era when it was widely thought that most educational programs were worth the money they cost, today's educators find that they are constantly called on to justify the effectiveness of their programs.

The kinds of evidence that health educators have been required to assemble regarding program effectiveness have, almost without exception, involved the use of various kinds of assessment instruments. Consonant with that requirement, this handbook contains numerous tests and inventories designed to secure the evidence needed to judge the effectiveness of diabetes programs. The handbook's measuring instruments were created specifically to assess important goals of the most common types of diabetes programs offered for adults and children.

The handbook, accordingly, makes available to those who operate diabetes programs the assessment tools by which the effectiveness of such programs can be determined. The evidence of program effectiveness currently being demanded of diabetes program personnel can, therefore, be provided by appropriate use of the handbook's assessment instruments. Moreover, as will be indicated shortly, appropriate use of the handbook's numerous assessment devices can substantially improve the *design* of diabetes programs.

Measurement and Program Design

Historically, assessment devices have been thought of as instruments to be used *after* a program was concluded. Teachers, for example, have traditionally administered tests *after* instruction was over in order to grade students. However, even though assessment instruments have often been post-instruction creations of instructors, such instruments can make important – often overlooked – contributions to the original design of an instructional program. Properly developed assessment tools, in fact, can contribute to program design in two significant ways.

First, because assessment instruments are typically intended to measure outcomes of interest, such assessment instruments provide program personnel with a range of potential outcomes. An increased range of possible program outcomes generally leads to the *selection of more defensible outcomes* for health education programs. To illustrate, there may be an

assessment instrument dealing with an attitudinal dimension that, were it not for the measuring instrument's availability, might have been overlooked by the program staff. Stimulated by the assessment tool's availability, however, the program staff can add the attitudinal dimension to the program's targeted outcomes.

A second program-design dividend of properly constructed assessment tools is that they *clarify intended program outcomes* and, thereby, make possible the provision of more on-target program activities than would have been the case had such clarification not been present. To illustrate, suppose that program personnel intend to feature in their evaluation an assessment device focused on a specific diabetes management skill. By becoming familiar with the composition of that assessment tool, the program staff can be sure to incorporate truly relevant practice sequences in their instructional program. Provision of appropriate instructional practice for participants need not reflect "teaching to the test" in the negative sense that instructors coach students for specific test items. Instead, providing relevant practice so that program participants attain the program's intended outcomes constitutes an efficient and effective, research-supported form of instruction.

To review, then, the measuring instruments provided in this handbook are intended to assist those who design and those who evaluate diabetes programs. With respect to program evaluation, the measures will yield evidence by which to improve programs as well as determine program effectiveness. With respect to program design, the measures provide a menu of potential program options and, once having been selected, enhanced clarity regarding the nature of the outcome(s) sought.

What the Handbook Contains

There are several key ingredients in this handbook. It should, therefore, prove helpful to readers if the handbook's major sections are presented. Briefly, then, here is a description of the handbook's major components:

Introductory information. In Chapter One an introduction to the handbook is provided. Because the handbook is intended to be used with diabetes programs, the chapter concludes with a series of evaluation-related issues specific to diabetes education programs.

Program evaluation essentials. Although a number of people who use this handbook will already be familiar with the nature of program evaluation, many handbook users will not be well versed in the conduct of program evaluations. Accordingly, in Chapter Two, an introduction is provided to the key operations involved in program evaluation. Although space limitations preclude a detailed exposition of all aspects of program evaluation, emphasis is given to the role that assessment instruments play in the gathering of information needed for defensible evaluations.

Assessment instruments. Chapter Three contains the handbook's most important components, namely, the measuring tools designed to be used in the evaluation and design of diabetes programs. These measures deal with behavior, knowledge, skill, and affective outcomes. *Behavior* measures focus on actual behaviors of program participants. Two types of behavior measures are included: paper-and-pencil measures of behaviors and observation checklists for the performance of key behaviors. *Knowledge* measures are concerned with participant mastery of a defined set of information. *Skill* measures deal with cognitive, that

is, intellectual competencies to be mastered by program participants. Finally, *affective* measures assess participants' attitudes and values.

Each measure is introduced by a brief description of the purpose of the assessment instrument, as well as procedures for administering, scoring, and analyzing the resulting data. All measures have been provided on detachable pages. At the beginning of Chapter Three, an overview description of the chapter's measures is provided to facilitate the selection of measures.

Local measure appraisal. Although the measures contained in this handbook have been created with considerable care and were pilot-tested in small-scale tryouts, the measures have not yet been subjected to a formal empirical appraisal of their technical adequacy. Thus, in Chapter Four, a description is provided of how such technical appraisals of the handbook's measures can be carried out.

Annotated bibliography. Because evaluators and designers of programs in diabetes may wish to consult additional sources regarding program design and evaluation, an annotated bibliography is provided to facilitate the handbook user's selection of such materials. (See Appendix C.)

Amplified content descriptors. The information eligible for inclusion in the knowledge measures is provided in the handbook's appendix as amplified content descriptors. (See Appendix A.) Additional content that can be used for the generation of new items is also presented. However, these descriptors are not exhaustive accounts of diabetes content.

How to Use the Handbook

The particular ways in which the handbook is used will vary from setting to setting and from user to user. For instance, if a handbook user is relatively unfamiliar with the key concepts of program evaluation, then a thorough reading of Chapter Two's treatment of program evaluation essentials is warranted. In addition, further reading based on the evaluation-related references included in the annotated bibliography would also seem useful.

For handbook users more familiar with program evaluation, primary attention will probably be focused on Chapter Three's measures. Although use of the measures will vary from situation to situation, a common four-step usage pattern is depicted in Figure 1.1.

Note that in Step 1, the measures are used to represent a range of potential program objectives. Clearly, an expanded range of options can lead to more appropriate decisions regarding what program objectives to pursue. In Step 2, after the measures for possible program evaluation have been reviewed, one or more measures are selected for use in the evaluation of the program. In Step 3, after the program-evaluation measures have been selected, the program staff studies the measures intensively to discern if there are program-design implications to be drawn from the measures. In Step 4, the measures are administered using one of the evaluative data-gathering designs described in Chapter Two and scored according to the scoring directions in Chapter Three. Finally, interpretations of the results are made.

It is important to remember that the handbook's measures are to be used for program evaluation, not individual decision making. Thus, if one of the handbook's affective

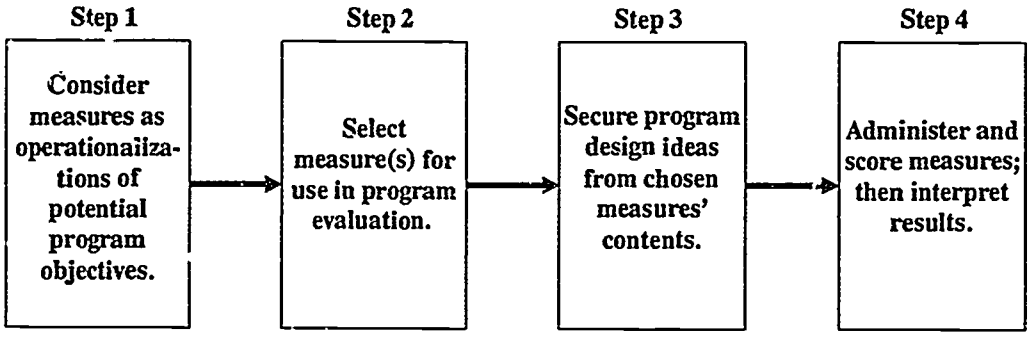


Figure 1.1: A four-step usage pattern of the handbook's measures

measures was used on a pretest-posttest basis, it is the *aggregation* of scores on the measure that provides us with an indication of the program's effectiveness. The measures were not designed to yield an accurate indication of an *individual* participant's status. Thus, it would be inappropriate to attempt to determine an individual participant's attitudes on the basis of the handbook's measures. The measures are relatively brief instruments designed to be administered without great intrusiveness. When the measures' scores are viewed in the aggregate, the measures can provide data of relevance to program evaluators. The data, however, should *not* be used for determining the status of individuals.

Another point related to use of the handbook's measures concerns the potential *reactivity* of certain measures, that is, the likelihood that if the measure is used *prior* to the program, the experience of completing a measure may cause participants to react differently to the program than had the measure not been administered. Reactivity is more frequently associated with affective measures rather than cognitive measures. Thus, handbook users will need to be alert to the possibility that a given measure, if administered prior to the program, might unduly sensitize participants to an aspect of the program.

To avoid such reactive effects, program personnel may need to divide participants into two subgroups so that only a portion of the participants receive any given potentially reactive measure. Such subgroups would not be given the same reactive measure both before and after the program. Rather, participants should be administered only post-program measures that they had *not* been given prior to the program. Indeed, two potentially reactive measures may be administered simultaneously under the conditions represented in Figure 1.2, where it can be seen that the pre-program performance of certain participants (one-half, for example) serves as a comparison for the post-program performance of other participants. Although a variety of data-gathering designs will be described in Chapter Two, the evaluator should employ care in using the handbook's measures so that they permit reasonable inferences regarding program effectiveness. Potential reactivity of measures should be examined when considering such designs.

Technical Quality of the Handbook's Measures

The measuring instruments to be found in Chapter Three were carefully constructed by an experienced test-development agency according to the guidance of prominent experts in the field of diabetes. All of Chapter Three's assessment devices were subjected to

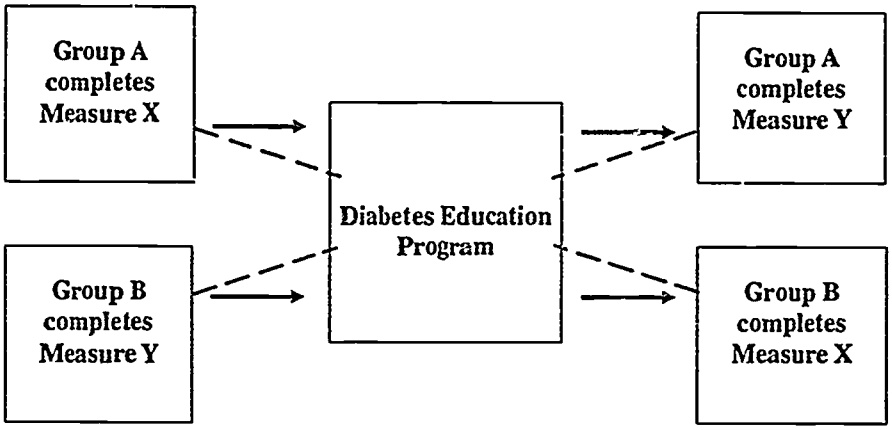


Figure 1.2: Using the handbook's measures to avoid reactive effects (Appropriate Comparisons = — — —)

small-scale tryouts, revised on the basis of those tryouts, and reviewed by diabetes specialists.

At the outset of this handbook-development project, it had been anticipated that all of the handbook's measuring instruments would be subjected to large-scale field tests so that substantial empirical evidence regarding the technical quality of the measures could be made available to handbook users. Unfortunately, that phase of the project could not be completed.

Thus, handbook users should be cautioned that, although the handbook's measures were developed with great care, there is currently no evidence available by which to ascertain the technical quality of the measures. Thus, handbook users must exercise caution in the use of Chapter Three's assessment instruments. In Chapter Four, as indicated earlier, a description is presented of the ways in which users of the handbook's measures, if they wish to do so, can carry out local studies regarding the technical quality of the measures that they find most suitable for their use.

This handbook is intended to help those who design and evaluate diabetes education programs. It is *not* intended to transmit content dealing specifically with diabetes. For those readers who wish to acquire information about diabetes, the list of references located at the end of this chapter may be helpful. Nonetheless, some attention to the substance of diabetes education must precede a consideration of approaches to program evaluation.

Diabetes

The treatment of diabetes has changed drastically over the last century. Prior to 1922, diabetes was considered an acute disease process. People with diabetes usually died shortly after they were diagnosed. With the discovery and subsequent commercial availability of insulin, people with diabetes started to take responsibility for the management of their disease. Much later, in 1978, self-monitoring of blood glucose (SMBG) became available. SMBG allowed people with diabetes to know instantly how much sugar was present in their

blood. Armed with this information, they could make appropriate adjustments in their insulin, diet, or exercise level. Now, more than ever, people with diabetes are expected to actively participate in all aspects of their diabetes management.

In order for patients to be effective participants in their own health maintenance and disease management, they must be carefully educated. Individuals with diabetes must be taught the basic facts about diabetes, the importance of preventing and treating diabetic complications, and the day-to-day activities of diabetes management. Thus, diabetes education programs were created to address this need.

Diabetes Education

It is recognized that education for diabetes self-management is a fundamental aspect of diabetes treatment. Although a treatise of diabetes education is beyond the scope of this handbook, several topics do warrant discussion here. These issues include the educational content appropriate for particular target groups, the different phases of diabetes education, and the settings where diabetes education programs are offered. In addition, the relationship of these topics to the use of the handbook's measures will be presented.

Target groups and educational content. Diabetes mellitus is classified into different types including type I (insulin-dependent) and type II (non-insulin-dependent). By definition, people with type I diabetes *must* take daily injections of insulin. People with type II diabetes *may* need to take insulin if other forms of therapy, such as diet, exercise, and oral hypoglycemics, have proved ineffective. About 90% of individuals with diabetes have type II diabetes (American Diabetes Association, 1984). Obviously, the vast majority of individuals in diabetes education programs will have type II diabetes.

All adults with diabetes, either type I or type II, need to be taught the fundamentals of meal planning, monitoring, and exercise. They also need to know about the acute and long-term complications associated with diabetes (National Diabetes Advisory Board, 1983). People with diabetes who take insulin need to know about the administration and effects of insulin. People who take oral hypoglycemics need to know about the effects and interactions of their medication.

Children with diabetes have type I diabetes. They too need to be taught information about diet, monitoring, exercise, acute complications, and insulin (Travis, 1985). Educating children about the serious long-term complications needs to be done with sensitivity. There is no reason to alarm children unnecessarily, but they should be taught that near-normal blood sugar levels can help prevent complications. This is an important concept to convey to children precisely because they are young and behavior patterns are still forming.

The measures that were developed *specifically* for this handbook have *not* been categorized by type of diabetes. Rather, all adult knowledge and skill measures have been divided into sections. All adults, regardless of the type of diabetes they have, will take the same measure, answering only those *sections* that are appropriate for their diabetes management plan. For example, **Management of Diabetes and Its Complications** is divided into three separate sections. All respondents complete section one, which presents items about monitoring, diet, exercise, and complications. Section two, which contains items on insulin and insulin-related issues, is only completed by respondents who take insulin.

Section three presents items on oral hypoglycemics and issues specific to type II diabetes, such as weight loss. This section is only completed by people who take diabetes pills. For the behavior and affective measures, the respondents are first asked whether they use a particular diabetes management component. If they do, they proceed to answer questions about that component. If they do not, they go to the next series of questions. There is one exception to this procedure. In the measure, **Feelings About Your Diabetes Management Plan**, respondents are given a "Does Not Apply" response option.

Two measures in this handbook were developed by researchers at the Oregon Research Institute. The **Diabetes Family Behavior Checklist I** is administered to individuals with type I diabetes. The **Diabetes Family Behavior Checklist II** is administered to individuals with type II diabetes. More information about these measures in provided in Chapter Three.

The measures designed for children and parents only contain items that pertain to type I diabetes. In general, parents should complete the parents' measures if *they* are primarily responsible for the management of their child's diabetes. Children should complete the preadolescents' measures if they possess adequate reading skills and are responsible for their own diabetes management. These measures are appropriate for preadolescents approximately ages 9 through 12.

Phases of diabetes education. Diabetes education is often divided into phases (Franz, Kresnick, Maschak-Carey, Parker, & Wheeler, 1986). The *initial* phase of education occurs around the time diabetes is first diagnosed. Most people who have just been diagnosed with diabetes are not in a position to learn large amounts of information. They are often hospitalized with an acute diabetic episode. They may feel anxious and upset about their diagnosis and the lifestyle changes they are expected to implement. The goal, therefore, of this phase of education is to provide patients with a *basic* level of knowledge and skills so they can *begin* to cope successfully with their diabetes.

The *in-depth continuing education* phase of diabetes education occurs after the patient has had the opportunity to "live with" the disease for awhile. Its goal is to provide the patient with the knowledge and skills needed to actively participate in the daily self-management of diabetes. This phase of the education must be individually tailored. For example, individuals who take insulin should be taught how to adjust their insulin based on their blood glucose results. On the other hand, individuals who take oral hypoglycemics need to know the facts about their particular medication and probably do not need to be taught about insulin. Ideally, people with diabetes who have undergone in-depth continuing education are able to assume complete responsibility for the day-to-day management of their diabetes.

In general, the measures in this handbook are appropriate for evaluating both phases of diabetes education. The knowledge and behavior demonstration measures are probably more useful for the evaluation of initial education programs. The behavior measures are probably more appropriate for continuing education programs because they are lengthy and require the individuals to recall *all* aspects of their diabetes management plan. It is important for program personnel to carefully review the measures to see which ones are suitable for their program needs.

Setting. The health care professional who probably has the most consistent interaction, over time, with the person with diabetes is the primary care physician. Unfortunately, physicians may find it difficult to provide extensive education in all aspects of diabetes management. There are, fortunately, a variety of diabetes education programs available. The vast majority of hospitals in most states offer diabetes education services. These programs often utilize a team of health care professionals including physicians, dietitians, nurses, diabetes educators, exercise physiologists, and pharmacists. Education may occur in a group setting with other patients and family members or on a one-to-one basis.

The measures in this handbook were developed for group assessment purposes. Individual results should be combined and examined only in the aggregate. The measures were not designed to make diagnostic decisions about individuals. The measures are, therefore, most appropriate for hospital-based programs designed for groups of individuals.

The future of diabetes education. The field of diabetes education will continue to change with each advance in medical research. Pancreas transplants as well as new methods for blood glucose monitoring and insulin administration are currently being studied. Just as the discovery of insulin changed the field of diabetes treatment so many years ago, any medical breakthroughs will require updated diabetes education programs. Such programs will be beneficial *if* they are effective. Use of this handbook to evaluate the effectiveness of today's, and tomorrow's, diabetes education programs is the focus of the next chapter.

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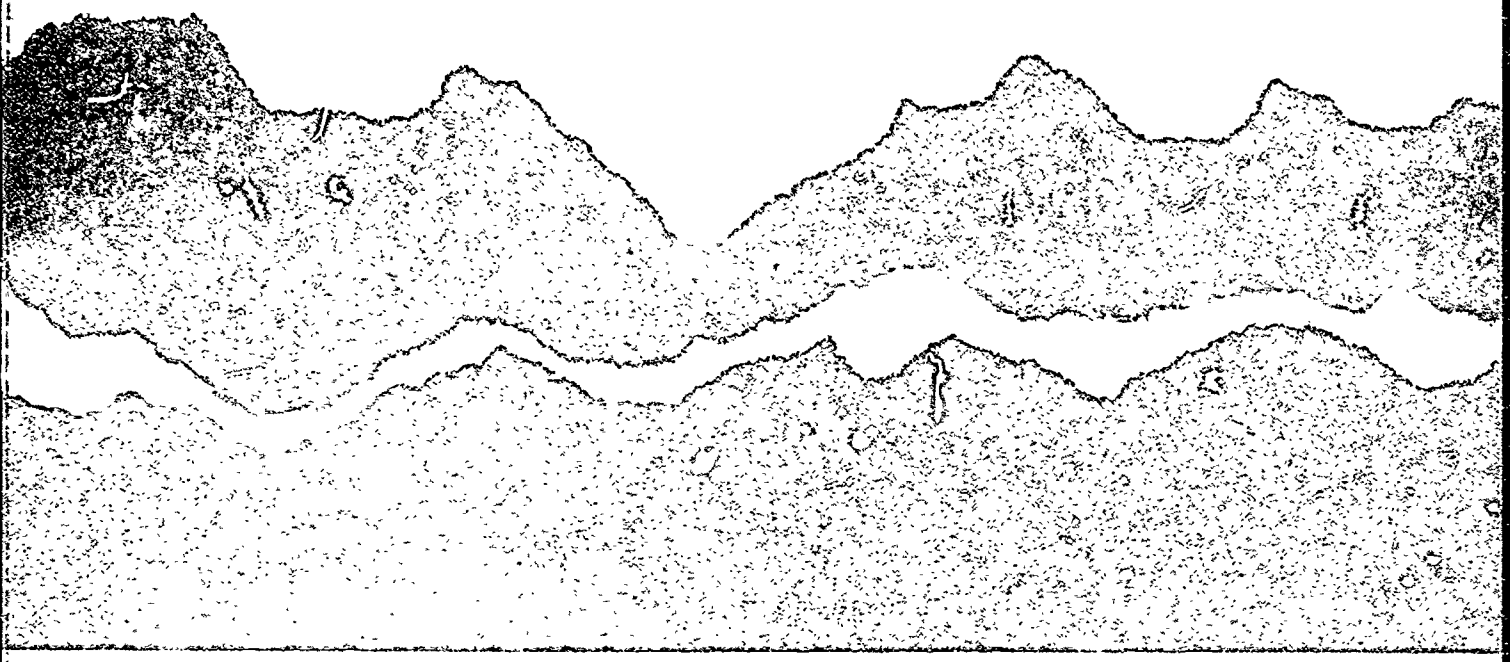
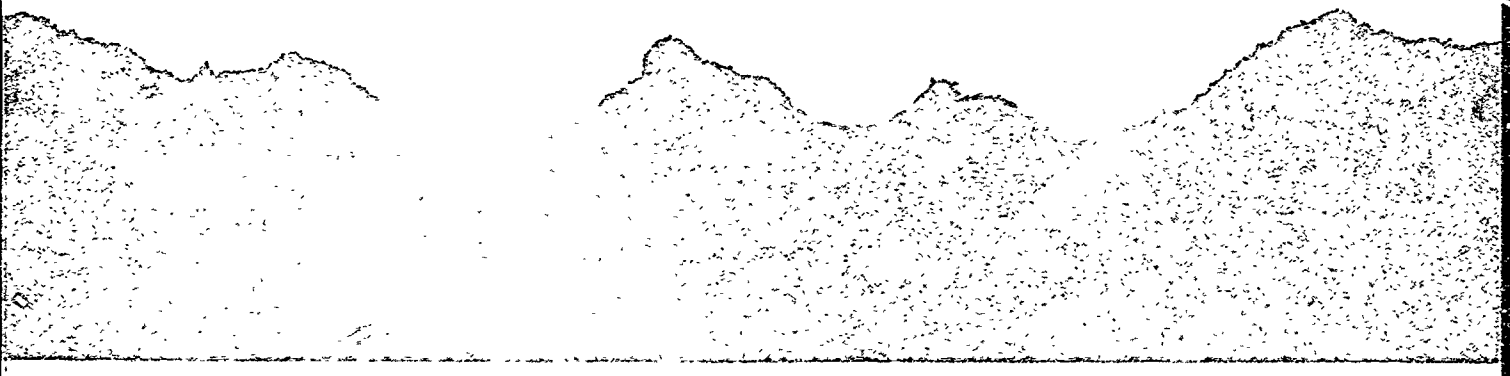
Travis, L. (1985). *An instructional aid on insulin-dependent diabetes mellitus.* Austin, TX: American Diabetes Association.



CHAPTER TWO

Essentials of Program Evaluation for Health Educators



Essentials of Program Evaluation for Health Educators

Education programs are intended to help people. Public school programs, for example, are intended to help youngsters acquire the skills and knowledge that they will need as adults. Similarly, health education programs are intended to promote participants' adoption of beneficial health-related behaviors. Yet, even though an education program might have been well intentioned, how do we know that the goals of the program were realized? Moreover, if a program is not meeting its goals, how can the program be made more effective?

Such questions constitute the core of program evaluation. In essence, evaluators want to discover whether a program has worked effectively and, if not, how it can be made more effective. When evaluation is used to improve programs, it can make a significant contribution to the well-being of program participants and, potentially, to the community at large.

In this chapter the nature of program evaluation will be considered as it relates to health education programs. The following topics will be discussed:

- Focusing the Evaluation
- Rights of Participants
- Selecting Appropriate Measures
- When to Administer Measures
- Data-Gathering Design Options
- Sampling Considerations for Data Collection
- Data Analysis
- Reporting Results

The purpose of this chapter is not to promote a particular evaluation model for health education programs. Rather, the chapter deals with considerations central to any evaluation effort. It is hoped that evaluators* of diabetes programs will be able to apply the chapter's contents to their endeavors.

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* Sometimes a program evaluation will be conducted by an individual not affiliated with the program itself – an individual formally designated as a program evaluator. More frequently, however, an evaluation will be carried out by the personnel who are actually operating the program. Whenever the term "evaluator" is used in this handbook, it will refer both to the evaluator-specialist and to the program staff member serving as evaluator.

Focusing the Evaluation

The results of a program evaluation can be used to improve decisions about programs. Anyone setting out to evaluate a health education program, therefore, should focus the evaluation on the *decisions* that are likely to be made about the program, either while the program is being implemented or when it is concluded. In other words, if evaluators know what decisions are apt to be faced by those who will use the evaluation's results, then information bearing on those decisions should, if possible, be collected during the evaluation. To determine what these decisions are, an evaluator needs to have a clear understanding of the purpose of the program, the specifics of the program, and the individuals or groups who may use the evaluation's results. Focusing the evaluation involves considerations such as (a) the nature and role in the evaluation of program objectives, (b) the summative and formative functions of evaluation, (c) the cost of the program, (d) the extent to which observed changes in participants will also be attributed to the program, and (e) the extent to which program effects will be generalizable to other situations. Each of these considerations is discussed below.

Objectives and evaluation. Health education programs are designed to bring about worthwhile effects. Most health education programs, therefore, are organized around some form of program objectives that focus on such intended effects. In general, the more clearly these objectives are stated, the more useful they will be in carrying out an evaluation.

One way of conducting an evaluation is to determine the extent to which a program's objectives have been achieved. Program designers too frequently describe their objectives in such ambiguous, general ways, however, that it is impossible to tell whether such loosely defined objectives have been attained. It is for this reason that it can be beneficial for evaluators to work with program personnel, prior to program implementation, to create program objectives that clearly describe desired post-program participant behaviors.

Another potential pitfall when creating program objectives is the tendency to delineate a set of hyper-detailed objectives. Specificity does not automatically yield utility. Instead, decision makers can become overwhelmed by long lists of low-level, albeit behaviorally stated, objectives. For example, a program objective that participants be able to identify trembling as a sign of hypoglycemia is going to lead down a path toward numerous small-scope objectives. Recent thinking regarding instructional objectives suggests that program objectives, *while still measurable,* should focus on larger, more significant types of participant post-program behaviors. A more significant diabetes-related objective, for example, might be that participants be able to identify the causes, symptoms, and treatments of hypoglycemia. Today's health education programs, rather than being organized around 30 minuscule (and, therefore, potentially trivial) objectives, might better be focused on a half-dozen more general, but still measurable, program objectives.

Most evaluators agree, however, that there is substantially more to program evaluation than merely determining whether a program's objectives have been achieved. For example, there may be effects of the program that were not anticipated in the program's stated objectives. Evaluators need to be attentive not only to the effects of a program that were anticipated, but also to any unforeseen program effects.

Summative and formative functions. Summative evaluation addresses the question of whether a program, in its complete and final form, is effective. The decisions associated with the summative evaluation are essentially go/no-go decisions, such as whether to continue a health education program or, perhaps, whether to disseminate the program more widely. *Formative evaluation* addresses questions associated with improving a program that is "under development," that is, still modifiable. The decisions associated with formative evaluation focus on ways to improve particular parts of the program. Formative evaluation is an ongoing endeavor conducted as the program is designed, installed, and maintained. Whereas summative evaluation's mission is to provide a final judgment about a program's overall merit, formative evaluation's mission is to bolster a program's quality on a continuing basis. The effective formative evaluator functions less as an external judge and more as a collaborating member of the program team. The formative evaluator's task is to monitor the program so that it can be improved.

Almost all programs are, at least to some degree, modifiable. Hence, only in rare cases do evaluators appraise a health education program in its complete and final form. One such instance might involve a materials-based diabetes education program. For example, if the program were found to be effective via a summative evaluation, a commercial publisher would distribute the program's materials nationally. In most cases, however, health education programs can be modified and improved. Thus, a formative, improvement-oriented evaluation can be carried out for most health education programs.

Cost-analysis considerations. Program evaluators are often so concerned about detecting the effects of programs that they fail to consider the *costs* of those effects. Yet decision makers need information regarding not only the effects of a program, but also the resources required to achieve those results. For this reason, program evaluators should carefully isolate and communicate the relative costs of programs. For example, information should be collected that can show how much Program A costs to produce a given result compared to the cost of Program B to produce a comparable result. Judgments about a program's impact without considerations regarding its costs are potentially superficial. In recent years there has been much attention to cost-analysis strategies. Although consideration of those procedures is beyond the scope of this handbook, serious evaluators of health education programs would do well to delve more deeply into cost-analysis procedures.*

Attributing observed changes to the program. Characteristically, an evaluation seeks to determine whether individuals have changed as a result of their participation in a program. The key issue is whether pre-program to post-program changes in the status of participants are attributable to the program itself or to other extraneous factors. Examples of extraneous factors are participants' maturation, their familiarity with the measures used in the evaluation, or their reactions to non-program events such as a health-related, mass media campaign. This issue revolves around the evaluator's ability to properly infer that the program itself caused any observed changes in participants. Technically, the degree to which

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* For additional information about cost-analysis approaches, see Annotated Bibliography Nos. 1, 28, and 29.

evaluators can validly infer that a program caused a set of observed changes is referred to as the *internal validity* of the evaluation study. Ideally, an evaluation's data-gathering design should help to rule out explanations other than the program itself for observed changes. (Data-gathering design options are discussed later in this chapter.) If evaluators are unable to attribute observed changes to the program, they will have difficulty in determining program quality.

Generalizing program effects. A related issue is the extent to which the findings of an evaluation study can be generalized to other situations. The issue here is whether similar results would be expected, for example, with a different group of participants, slight variations in the program, or changes in program personnel. The degree to which the results of an evaluation study can be generalized elsewhere is technically described as the study's *external validity.*

If evaluations are generalizable, they can provide useful information to (a) program personnel regarding the range of conditions under which the program is effective and (b) other health educators who may wish to adopt an already "evaluated" health education program. A diabetes program that works well in one setting may provide helpful guidelines for those wishing to operate other diabetes programs. Typically, however, a local evaluation should be conducted once the program has been adopted.

It is important to distinguish between a program's causative power and the program's generalizability, because different information may be required to establish each factor. Procedures that limit the number of extraneous variables in the evaluation (e.g., including only males) increase internal validity but, at the same time, limit generalizability. Evaluators must try to balance the problems associated with threats to internal and external validity by selecting a data-gathering design that best addresses the information needs of program personnel as well as of those external to the program who may be interested in adopting the program elsewhere *

Rights of Participants

Health education programs are designed to improve individuals' health and well-being. When such programs are evaluated, therefore, the focus is typically on a program's impact on human beings. Some evaluators, however, become so caught up with the importance of appraising a health education program that they overlook the rights of the individuals who take part in the evaluation. Two important rights are those of informed consent and confidentiality.

Informed consent. Evaluators, just as researchers, should be guided by a profound respect for human dignity. Therefore, they should not engage in evaluative activities that in any way demean participants. Prominent among the considerations that should guide evaluators is the concept of *informed consent.* Informed consent requires that an evaluator secure, in

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* For additional information about internal and external validity issues, see Annotated Bibliography Nos. 8, 11, 12, and 16.

advanc. of the study, permission from the participants in an investigation to gather data from them. This consent is obtained *after* the potential participants have learned about the nature of the investigation and what their role would be, because that information may influence their decision to participate. Informed consent eliminates the possibility of making individuals unknowingly serve as subjects in an evaluation.

Two different approaches to securing informed consent have been employed by program evaluators. The first of these, *active informed consent,* obliges an evaluator to obtain, in writing, a statement from each participant indicating that the individual is willing to participate in the evaluation. The significant aspects of the evaluation must be described in the written permission form so that potential participants are fully informed when they give their consent.

An evaluator using the second approach, *passive informed consent*, supplies descriptions of the evaluation's essentials to all program participants and provides them an opportunity to register, in writing, their unwillingness to participate in the study. In other words, when a passive informed consent approach is used, participants return the forms supplied to them only if they are *not* willing to participate in the evaluation study. Of the two approaches, the active informed consent strategy typically results in fewer participants because those individuals who do not provide consent forms must be excluded from the study. Because evaluators who conduct studies involving school-age children are obliged to secure informed consent from underage participants' parents or guardians, a passive informed consent strategy is often adopted due to the difficulty of securing active informed consent from individuals who are not participating in the program themselves.

Procedures for developing forms for both of these approaches to securing informed consent are described in Appendix B. The actual forms to be used in an evaluation would need to be created so that they are specifically relevant to the program involved.

Confidentiality. Another consideration when dealing with human subjects is the *confidentiality* of all information gathered during an evaluation. Because the evaluator is not concerned with an appraisal of individual participants but, rather, with gauging the effectiveness of a health education program, ensuring participant confidentiality usually poses no problem. Evaluators must, however, devise protective safeguards, such as anonymous completion of forms and careful handling of data, to ensure both the appearance and reality of confidentiality.*

Selecting Appropriate Measures

Although there are various approaches to program evaluation, almost all share one common feature, namely, the systematic gathering of evidence regarding a program's effects. To secure evidence of program effects, evaluators usually employ measurement

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* For additional information about the rights of human subjects and the ethics of evaluation, see Annotated Bibliography Nos. 2, 26, and 38.

instruments. Some instruments, however, are far more suitable for assessing a program's effects than others.

Criterion-referenced measurement. For more than two decades, educational measurement specialists have directed increasing attention toward an emerging form of assessment known as criterion-referenced measurement. In comparison to norm-referenced measurement, which attempts to ascertain an examinee's status in relation to the status of other examinees, criterion-referenced measurement attempts to ascertain an examinee's status in relation to a clearly defined set of behaviors. The essence of a criterion-referenced instrument is the clarity with which its accompanying descriptive materials explain what is being measured. Because norm-referenced instruments emphasize *relative* comparisons among examinees, they often do not provide a clear description of exactly what it is they are assessing. In contrast, criterion-referenced instruments are *absolute* measures, designed to determine exactly what it is that examinees can or cannot do, without reference to the performance of other examinees. Thus, criterion-referenced tests provide a clearer description of what they are measuring.

It is the clarity regarding what is being assessed that renders criterion-referenced measures ideal for the evaluation of health education programs. Consistent with the mission of providing useful information for decision-makers, criterion-referenced instruments describe the precise nature of what is being measured. Hence, when criterion-referenced measures are used to gather evidence in program evaluations, decision makers can accurately interpret the evidence being supplied.*

Attributes of well-constructed measures. All instruments, whether norm-referenced or criterion-referenced, should measure what they are measuring with consistency. The consistency with which an instrument measures is known as its *reliability.*** There are several different indices that can be computed to reflect an instrument's reliability. The kind of reliability data needed to appraise a measure for possible use in an evaluation study should be consonant with the way the measure will be used in that study. If a measure is to be used on a test-retest basis, for example, then information about that type of reliability is germane. If alternate forms of a test are to be used, for instance, in a pretest-posttest situation, then evidence should be available regarding alternate-forms reliability so that the evaluator can determine whether or not the two different forms are sufficiently equivalent.

It should be noted that when a health education program is being evaluated, attention should be directed to the impact of the program on a *group* of participants. Thus, the consistency to be sought when measurement instruments are used for program evaluation is consistency for a group of participants' scores. When dealing with individual participants, the measures must yield *individual* or diagnostic consistency.

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* For additional information about the nature and development of criterion-referenced measures, see Annotated Bibliography Nos. 7, 24, and 34.

** For additional information about determining the reliability of measuring instruments, see Annotated Bibliography Nos. 3, 18, 19, 23, 27, and 34.

A second critical attribute of a properly constructed measure is that it yields scores from which valid inferences can be drawn. An instrument is often said to be valid "if it measures what it purports to measure." Such a statement, however, is technically in error. Tests themselves are never valid or invalid. Rather, it is the *interpretations* made from test scores that are valid or invalid.

There are several types of validity evidence, each yielding somewhat different but conceptually related indications about our ability to make valid inferences from a measure. Evidence of validity is, in the opinion of most measurement specialists, the most important consideration in judging the adequacy of measurement instruments. Program evaluators should make sure they are knowledgeable about methods of securing validity evidence.*

A final consideration in appraising the quality of measures used for program evaluation deals with the presence of *bias* in the assessment devices. During the past decade, measurement specialists have become particularly aware that many educational assessment devices contain items biased against particular subgroups, such as ethnic minorities or women. An example of a biased test item would be a knowledge question that, because of peculiarities in its content or wording, is more difficult for women to understand and answer correctly than it is for men, even though the men and women have an equivalent amount of knowledge regarding the particular concept being tested.

Another type of bias that can adversely influence examinee performance arises when test items are offensive to particular groups of individuals. For example, if a test item includes content that is seen to be derisive to members of particular ethnic groups, then examinees from those groups are not apt to perform at their best on the item. Their warranted agitation over the offensive content is likely to interfere with their responses to that item as well as to subsequent items.

There are now available both judgmental and empirical techniques for detecting the presence of biased items. These approaches should be used to identify, then eradicate, bias in a measure's items.**

Finally, it is important to note that any given instrument may not possess all of the qualities discussed above. Often evaluators must choose among measures that embody some but not all of the elements described here, that is, (a) descriptive clarity, (b) reliability, (c) validity, and (d) absence of bias. Another important point is that merely because a measure is *labeled* in a particular way, for example, as criterion-referenced or as nonbiased, that does not automatically indicate that it is of sufficient quality to be used in evaluating a health education program. Scrutiny of all aspects of the measure's quality is requisite.

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* For information about obtaining validity evidence regarding measuring instruments, see Annotated Bibliography Nos. 3, 18, 19, 23, 27, and 34.

** For information about methods for avoiding test bias, see Annotated Bibliography Nos. 6 and 33.

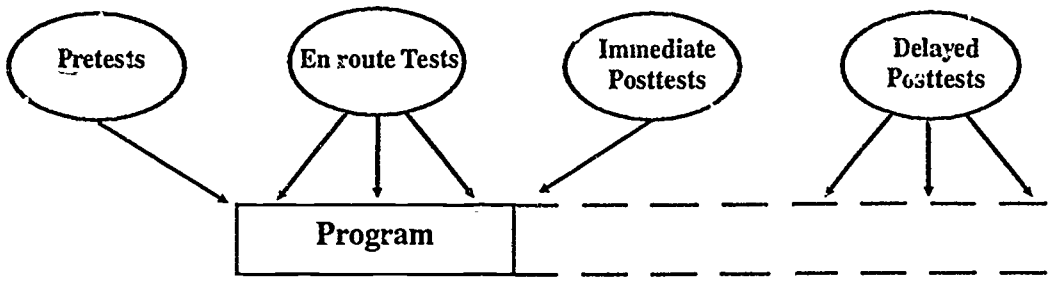

Figure 2.1: Possible measurement times in program evaluation studies

When to Administer Measures

Decisions regarding when to administer measures depend on the data-gathering design selected. Conceivably, there are four temporal periods during which it may be useful to obtain evaluative information about participants of health education programs. There may also be reasons for repeated measurement during some of these periods. These periods are depicted in Figure 2.1.

Pretests. Often it is useful to have information about participants prior to their starting the program. Such information, typically referred to as pretest data, may be used to identify participant needs so that instruction can be targeted directly at those areas. In addition, pretest data can be compared with data collected at the end of a program. Such a comparison can provide a measure of program impact.

En route tests. Measures can also be administered during a program to secure current readings on the status of participants. For purposes of formative evaluation, en route data can be used to redirect resources during the program by providing program personnel with ongoing status-checks on participants' progress. Thus, en route tests may be even more useful than tests administered at the end of the program, because en route measurement provides information while there is still time for program personnel to act on it. This type of assessment is most appropriate for programs of long duration (e.g., several months or more).

Immediate posttests. Measures are commonly administered following a program. The data from posttests can be compared with pretest data to examine changes in participants from the beginning to the end of the program. Participants' posttest performance can also be contrasted with posttest scores from participants in other programs. In addition, posttest data provide an indication of the absolute status of participants on the variables of interest at the completion of the program.

Delayed posttests. Data from delayed or follow-up posttests are often as important or more important than immediate posttest data in evaluating a health education program. Delayed posttest data might be secured, for example, several months after a program's conclusion. Far too frequently data collection efforts are limited to those times when measurement is most convenient. Ultimately, however, health educators should be

interested in effecting long-term, rather than short-term, behavioral, affective, and cognitive changes. It is nearly impossible to infer such long-term changes on the basis of information gathered solely at the end of a program. As indicated in Chapter One, many of the desired changes in participants of diabetes programs represent long-term rather than short-term objectives. For most health education programs, some follow-up measurement is usually warranted.

Clearly, it is not sensible to administer all measures at all time periods. Evaluators, in collaboration with program personnel and other interested parties, need to select a measurement scheme that focuses on the most appropriate times for gathering data. Just as it is desirable to avoid administering an excessive number of different measures, it is also necessary to avoid an excessive number of administrations. It may be useful to administer certain measures (for example, a brief behavioral self-report measure) on a continuing basis; other more time-consuming measures might be administered less frequently. Decisions about when to administer measures should be guided by common sense, attentiveness to participants' feelings, the efficient use of resources, and any conventional expectations, such as when a delayed posttest is ordinarily given.

Data-Gathering Design Options

It is sometimes thought that program evaluations must include complicated and elaborate data-gathering designs in order to yield decisive and compelling data. This is simply not the case. Program personnel and evaluators should try to conduct evaluation studies and gather data in such a way that the ambiguity of results can be reduced to a minimum. That is, evaluations must attempt to determine whether a program works and what makes it work or what prevents it from working. Data-gathering designs serve as the means to this end by setting forth the procedures to be used in exploring the nature and impact of a program.

The data-gathering design that an evaluator chooses for an evaluation will determine the inferences the evaluator can make about a program's overall impact on participants and the effectiveness of its various components. To select the best designs for evaluation studies, evaluators must have a broad knowledge of the available data-gathering design alternatives and the strengths and weaknesses associated with each. Evaluators must also work closely with program staff to determine what decisions are at issue regarding the program. No evaluation study will be perfect; every evaluation leaves some questions unanswered. Evaluators need to be clear regarding what they have learned about a program and the degree of certainty associated with their findings, and they must convey this information to appropriate audiences.

An important concept related to data-gathering designs is randomization. Randomized selection and assignment are described below, followed by brief descriptions of the most common data-gathering designs available for evaluators of health education programs.

Randomization. One technique that can prove useful to evaluators is *randomization,* which involves the selection or assignment of participants in a nonsystematic manner, such as by using a table of random numbers (found in most statistics texts). A prominent application of randomization in program evaluation is *randomized selection* of subjects. This sort of randomization is particularly important when the evaluator wishes to generalize from

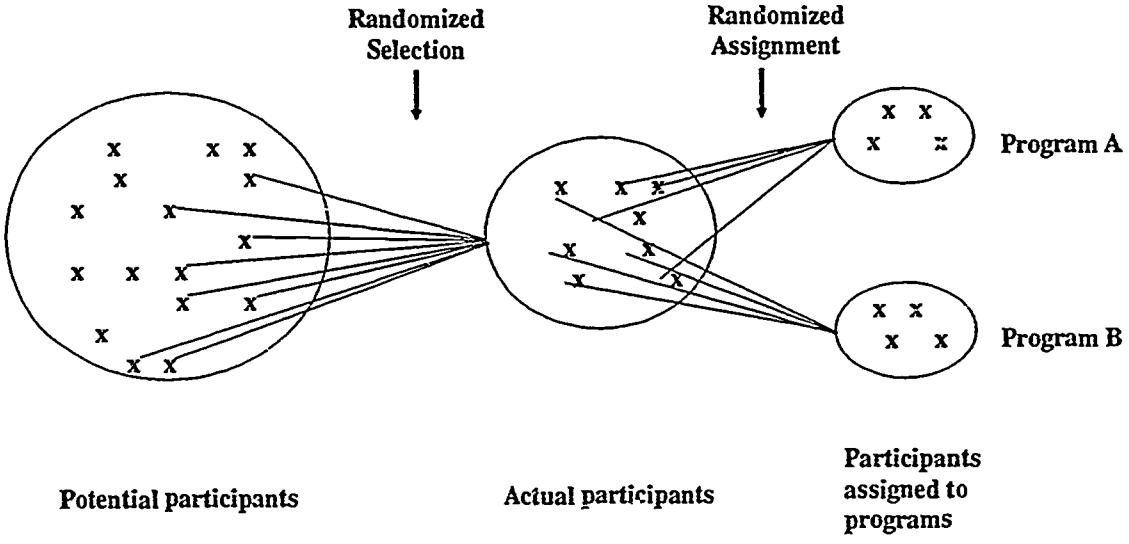

Figure 2.2: Randomized selection of participants from pool of potential participants and randomized assignment of participants to programs

the results of a study to a larger population. When the participants taking part in the program to be evaluated have been selected at random from a larger population of potential participants, then the evaluator can be reasonably confident that those involved in the evaluation will be representative of that larger population. There is less likelihood that the participants being studied in the evaluation are atypical, which would make it inappropriate to generalize the evaluation's results to the population at large. Randomized selection of subjects may also be useful when there are more applicants than vacancies for a program.

Another use of randomization is to assign participants to different "treatments" or programs. If an evaluator wishes to compare the effects of different treatments, then the evaluator wants the participants in each treatment to be as equivalent as possible. To this end, evaluators can employ a *randomized assignment* procedure whereby individuals are randomly placed in the treatments or programs to be compared.

The two procedures of randomized selection and randomized assignment are illustrated in Figure 2.2. Note that participants are randomly selected from the pool of potential participants, and then randomly assigned to either Program A or Program B.

The use of randomization techniques does not necessarily create equivalent groups. For example, if an evaluator were to randomly assign 50 potential participants in a hospital's diabetes program to treatment and no-treatment groups, it is still possible that one of the groups would contain individuals who, when pretested, were significantly different in some important aspect from those in the other group. In such instances, evaluators must rely on statistical procedures in an effort to compensate for such disparities. In most cases, however, use of randomization will create groups of sufficient equivalence that such statistical adjustments are not needed.

In practice, program personnel often may not have the luxury of constituting groups via randomized selection or assignment. For example, local school board policies might require that *all* youngsters be provided with any program regarded as potentially beneficial. When randomization is not used, it is especially important to collect and examine descriptive data about participants to determine where pre-program group differences occur and to consider the ways in which such differences may influence post-program data. Even if randomization is impossible, attempts to constitute comparison groups with individuals as equivalent as possible can help minimize the influence of preexisting participant differences.*

Seven different data-gathering designs of potential utility for evaluators of health education programs will be presented below. Each data-gathering design will be described and depicted schematically. Some of the major factors involved in the selection of data gathering designs will be addressed.

The case-study design. Consider a six-week program aimed at modifying participants' knowledge about diabetes management. If participants' knowledge were measured only at the close of the program, we could describe the data-gathering approach as a *case-study design* and represent it schematically as shown in Figure 2.3.

Figure 2.3: Case-Study Design

If this were the design employed in an evaluation, what could an evaluator tell about the program's impact on participants' knowledge? How confident would an evaluator be that participants' knowledge about the complications of diabetes was attributable to the program?

It would be difficult, with confidence, to attribute any effects to the program. The program, indeed, may have been totally ineffectual. In fact, participants' post-program knowledge might be identical to their knowledge before the program. The participants could be demonstrating knowledge that they brought to the program, not that they acquired during the program. Because we have no measure of participant knowledge prior to the program, we cannot distinguish between preexisting knowledge and knowledge acquired as a result of the program. Hence, with the case-study design, it may be impossible to determine whether the program had any impact on participants.

Even though attributions of causality are often unwarranted, it may be possible to secure useful program evaluation data with such a data-gathering design. Suppose, for example, that a health education program is promoting a body of knowledge so advanced that few, if any, individuals would be familiar with it. In such a setting, one could assume that

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* For additional information about randomization, see Annotated Bibliography Nos. 8 and 25.

participants' post-program knowledge is attributable to the program's impact because participants would almost certainly not have acquired the knowledge without the program. It might not be worth the resources necessary to implement a data-gathering design capable of conclusively demonstrating that participants began the program unfamiliar with the knowledge being promoted.

This example illustrates an important data-gathering consideration, namely, that the chief mission of data-gathering designs is to *rule out plausible rival explanations,* that is, explanations other than the program's impact, that might account for the post-program status of participants. If there is reason to believe that participants' pre-program status may account for their post-program status, then a data-gathering design should be selected that permits the evaluator to rule out this rival explanation.

The one-group pretest-posttest design. Now suppose that, to avoid the major shortcoming of the case-study design, an evaluator measures participants' behavior both before and after a health education program. This data-gathering approach can be described as a *one-group pretest-posttest design* and can be represented as shown in Figure 2.4.

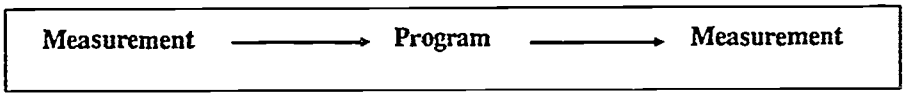

Figure 2.4: One-Group Pretest-Posttest Design

Assume an evaluator uses the one-group pretest-posttest design and that the data reveal a substantial shift toward more desirable behaviors between the initial and the final measurement. Can this change in behaviors be ascribed to the program? Unfortunately, the evaluator cannot be sure. There are many other factors, totally unrelated to the program, that may have influenced participants' behaviors. For instance, if a diabetes program emphasized the relationship between diabetes and cardiovascular complications, and at the same time the latest research linking diabetes and heart disease received attention in the national news, such an event may have influenced participants' views regarding diabetes and cardiovascular complications. Evaluators of programs that serve children must also consider the possible effects of maturation during the time the program is offered. Participants' increased maturity may cause pre-program to post-program shifts in behaviors. The program itself may have contributed nothing to the measured shift of behaviors. Such extraneous factors decrease the evaluator's ability to draw defensible conclusions about the program's impact.

As was true with the case-study design, however, if there are no plausible rival explanations for the posttest results, the one-group pretest-posttest design can be suitable for the task at hand. In fact, this simple yet serviceable design is often used in formative evaluation.

The one-group pretest-posttest design requires measurement before as well as after a program. This points to a commonly accepted but often overlooked principle of effective program evaluation. Evaluation is most effective when it is initiated at the beginning of a

program. If evaluators are not called in until the end of a program, they may be hampered in their efforts to design a credible program evaluation.

The nonequivalent control/comparison group design. Program evaluators can eliminate some of the more common rival explanations for changes in participants' behaviors by using data-gathering designs in which either comparison or control groups are employed. The use of a control group (untreated individuals) or a comparison group (individuals receiving a different program) requires two groups that are assumed to be relatively similar (before the program) on all related variables. When using these designs, the evaluator should attempt to secure two groups that are as similar as possible. Because the two groups are not randomly assigned to the two conditions, however, they cannot be assumed to be *equivalent,* hence the design's designation as a "nonequivalent" control or comparison group design.

In the control-group version of this design, only one of the groups is given the program to be evaluated; the other group is left untreated. This data-gathering design, known as the *nonequivalent control group design,* is illustrated in Figure 2.5.

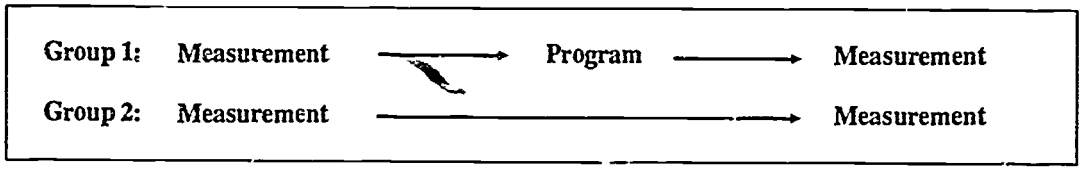

Figure 2.5: Nonequivalent Control Group Design

In this design, a control group (Group 2) is assessed before and after the program, but it never receives the program itself. Assuming that the groups were similar before the program, if the program participants' behaviors change while the behaviors of those in the control group remain the same, the evaluator can be reasonably confident that the program caused the change.

The use of an *untreated* control group may strike some health educators as a particularly unsavory data-gathering ploy. After all, health educators design their programs to benefit participants. To withhold such programs from individuals, even for the important purpose of evaluating the program's effectiveness, seems downright reprehensible. Yet, the individuals from whom the program is withheld, that is, the members of the control group, can be given the program *subsequently,* as soon as the evaluation study has been concluded. Also, in some situations there are more program applicants than can be accommodated, and, therefore, some prospective participants must be denied access to this program under any circumstances. Those who are not admitted to the program could be used as a control group, and admitted to the program the next time it is offered.

A variation of the nonequivalent control group design involves the use of a comparison group, that is, a group receiving a different program or a different treatment. Program evaluators frequently find themselves studying the quality of two or more competing programs. Thus, the evaluator focuses on the relative virtues of two or more different programs rather than on a contrast between a single program and an untreated control group. A schematic depiction of a *nonequivalent comparison group design,* in this instance

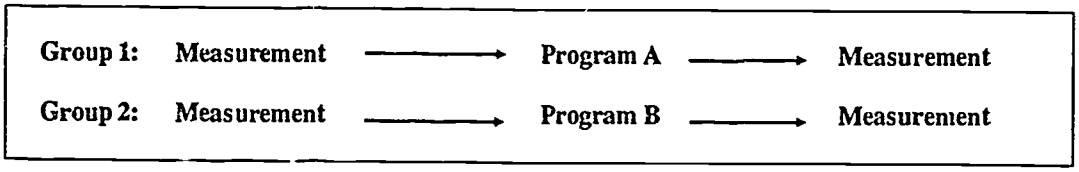

Figure 2.6: Nonequivalent Comparison Group Design

contrasting two different programs, is presented in Figure 2.6. As indicated below, more than two groups can be employed when using a nonequivalent comparison group design. An evaluator using this design can be fairly certain that, if the groups were similar before the program, any differences in post-program behaviors are due to the differential impact of the two programs.

There are, however, potential problems with the nonequivalent control/comparison group designs. It may be that the initial measurement was *reactive*. A reactive measurement is one that, by itself or in combination with the program, influences participants' behavior. Attitude inventories and self-report questionnaires about behavioral practices are notoriously reactive. For example, a questionnaire administered before the program might alert participants to the importance of a desired behavior. This would heighten their attentiveness when the program dealt with content related to that behavior and, as a consequence, influence their performance on the second measurement.

Moreover, measurement is expensive. Measuring the status of control groups requires valuable evaluation resources. Time and money can often be better spent studying the program being evaluated rather than studying a no-treatment control group of little intrinsic interest. Health educators should not ritualistically employ control groups in their designs if the questions at issue can be answered without the use of untreated groups.

The pretest-posttest control/comparison group design. There are two data-gathering designs that are of particular value to program evaluators if randomized assignment is possible. The first of these is the *pretest-posttest control group design,* illustrated in Figure 2.7.

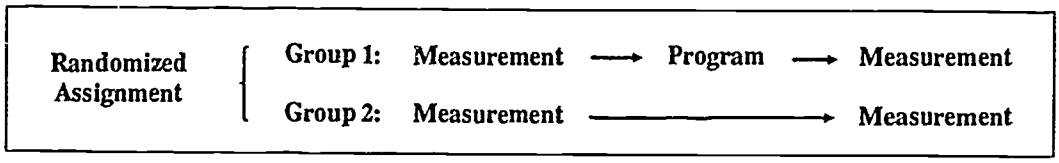

Figure 2.7: Pretest-Posttest Control Group Design

The difference between this design and the previously considered nonequivalent control group design is, of course, the randomized assignment of subjects to the two groups. This feature of the design is a particularly important one, because creation of two or more groups using randomized assignment is an effective way of promoting equivalence between the groups, especially if the number of subjects in each group is large (say, 30 or more).

Equivalence of groups at the beginning of the program strengthens the inference that any differences at the conclusion of the program are due to program impact.

By using comparison groups, that is, two or more program groups, instead of an untreated control group, the evaluator would be using a *pretest-posttest comparison group design,* shown in Figure 2.8.

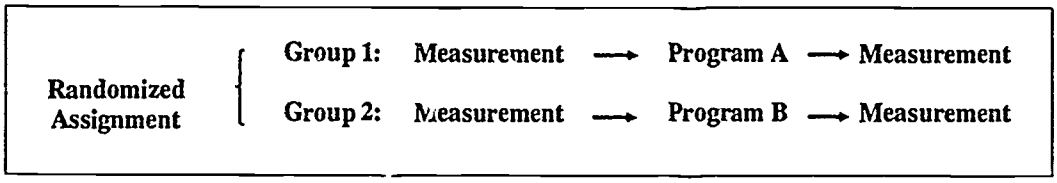

Figure 2.8: Pretest-Posttest Comparison Group Design

Because pretests are used in both of these designs, the possibility of reactive preprogram measures is still present. For situations in which reactivity is of great concern, a different data-gathering design, described next, has much appeal.

The posttest-only control group design. In situations where a measure is likely to be reactive, the evaluator can rely on a clever data-gathering design that effectively dodges the reactivity problem. This *posttest-only control group design* is depicted in Figure 2.9. This design is the same as the pretest-posttest control group design, except that there is no pretest.

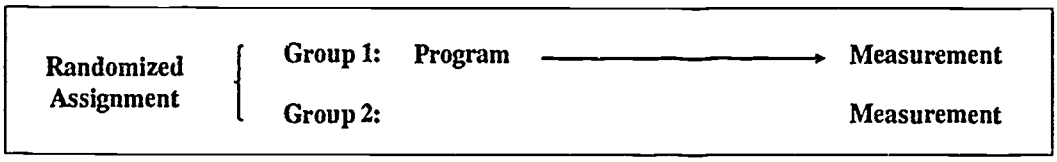

Figure 2.9: Posttest-Only Control Group Design

In this design, neither Group 1 nor Group 2 is pretested, but because of random assignment, the groups can be considered equivalent prior to Group 1 receiving the program. Not pretesting Group 1 effectively avoids a pretest's potentially reactive effect on program participants. To assess the impact of the program, it is possible to contrast the *posttest* performances of Groups 1 and 2. As with the other control group designs, the untreated control group could be given the program the next time it is offered.

The basic dividend of the posttest-only control group design is that by measuring an untreated, randomly assigned control group, the evaluator secures an estimate of how program participants would have responded on a pretest, but without introducing the potentially reactive effects of a pretest. Although the diagram for this design suggests that

the measurements be made for both groups at the conclusion of the program, it is possible to measure the untreated control group earlier if that seems advisable.

Multiple measures over time. There are certain situations in which health educators may wish to appraise the effects of their programs on the basis of periodic measurements, for example, by using regularly administered questionnaires or data that are routinely recorded. For instance, suppose when evaluating a hospital-based diabetes program, the evaluator was interested in the number of times program participants are admitted to the hospital's emergency room for diabetes-related problems. The evaluator might study the hospital's records at periodic intervals before, during, and after the program. By observing the frequency of diabetes-related emergency-room admissions for program participants during different time intervals, the evaluator would have valuable information regarding program effects.

A number of the most commonly used data-gathering designs have been described. There are other, more complex designs than those treated here.* Complexity, however, is rarely an asset if a simpler, more straightforward design is appropriate.

Sampling Considerations for Data Collection

The data-gathering requirements of an evaluation can become a burdensome intrusion into an ongoing health education program. Participants in a diabetes program can become more than mildly annoyed if evaluators are requiring them to complete measures every hour or so. Accordingly, evaluators should conduct their data-gathering activities in the least intrusive manner possible. One way to minimize an evaluation's intrusiveness is by relying on sampling techniques, such as person-sampling and item-sampling, each of which is described below.

Person-sampling. To estimate how a large group of people would respond on a particular measure, it is not necessary to administer the measure to all the individuals in the group. Instead, a smaller group can be selected. This smaller group can be either a *simple random sample* or a *stratified random sample,* that is, a sample stratified on the basis of program-relevant factors such as age, sex, and socioeconomic status. Assuming that the sample is randomly selected, the evaluator can estimate the status of the total group based on the responses of the sample.

Suppose, for example, that the evaluator wants to use a measure to determine participants' perceived ability to follow a diabetes management plan. Assuming that there is a reasonably large number of program participants, say 50 or so, the evaluator could randomly select half of the participants and administer the measure to this group only. In essence, this approach allows the evaluator to infer how the total group of participants would score on the measure, even though only half of the participants completed it. Thus, it

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* For additional information about evaluation design options, see Annotated Bibliography Nos. 8, 11, 22, 23, and 35.

is possible to estimate total group performance with only half the amount of participant time required for data gathering.

Using a similar sampling procedure, evaluators can administer two or more measures at once in the time it takes to administer one. Suppose that two measures are to be given to program participants. The evaluator can randomly assign one measure to half of the participants and the other measure to the remaining participants. Each participant needs to respond to only one measure, but the evaluator can derive defensible estimates of how all the participants would have responded on both instruments.

Item-sampling. In addition to sampling persons, as in the previous examples, it is also possible to sample items, so that different sets of items from a program evaluation measure are randomly selected to be administered to different persons. Using this approach, the evaluator gives each participant only a sample of the items on any particular measure. For example, suppose a program evaluator wishes to administer a 30-item test. Given 60 participants in the program, the evaluator could divide the test into three sets of 10 items each and administer each set of 10 items to 20 different participants. In this way, the total group's performance on the whole test can be estimated. This approach to data-gathering requires only one-third of the time that would have been required to administer the total 30-item test to all participants.

Sample size. Given the relatively small number of participants in some health education programs, is it really appropriate to sample either persons or items? How large must groups be before these sampling procedures can be sensibly used? Unequivocal answers to these questions do not exist. Some texts on sampling provide rules of thumb for estimating the size of samples needed for detecting group differences in relation to the magnitude of differences sought and the nature of the groups being sampled. At best, though, these rules provide only rough estimates. It is important to recognize that the task of identifying a sufficiently large sample is more difficult than usually thought.

The variability of participants' anticipated performance on the measures is the primary determiner of the sample size necessary. If it is expected that participants' scores on a test will be relatively homogeneous, a smaller number of respondents will be needed than if participants' scores are expected to vary widely. Thus, if on a measure of knowledge about pregnancy and diabetes, for example, some of the participants are expected to know a great deal and others are expected to know very little, reasonably large numbers of participants (e.g., 20) should respond to any one item.

Intuitively, one recognizes that when working with a very small group of program participants, the use of these sampling techniques is risky. For instance, if there were only 15 participants in a program, few evaluators would try to split these participants into three groups of five each for purposes of taking different sets of items. Even though each group represents one-third of the total population, there is too much likelihood that a sample of five individuals would not properly represent the total group. One or two atypical participants in a five-person group would render the group's average performance unrepresentative of how the larger group would have performed.

It should be noted that when employing procedures such as person-sampling or item-sampling, an evaluator is focusing on a group of participants *in the aggregate.* Because

evaluations are typically concerned with the effects of programs on groups of participants, the use of sampling procedures is usually appropriate. If, however, program personnel need individual data on all examinees, then sampling should obviously not be employed.*

Data Analysis

A frequent question asked of an evaluator is whether a study's results are statistically significant. For example, could the observed changes in program participants' knowledge or behavior from pretest to posttest have occurred simply by chance? Statistical tests are used to answer this type of question. Consideration of statistical analysis procedures, however, is beyond the scope of this handbook. Thus, just a few comments will be made here regarding data analysis. Because there are many subtle choice-points in the statistical analysis of evaluation data, evaluators who are not well versed in at least the more common statistical procedures should probably enlist the aid of someone who is.

There are two basic classes of statistics, namely, descriptive statistics, such as the mean, and inferential statistics, such as the *t* test. *Descriptive statistics* help evaluators portray a group's performance on a given measure. For example, an evaluator might describe a set of participants' scores via the mean score (the scores' central tendency) and standard deviation of the scores (the scores' variability). Because the mean and standard deviation are frequently used, program evaluators should know how to calculate and interpret them. Any introductory statistics book for the social sciences will serve as a reference for this information. *Inferential statistics* help evaluators determine whether an observed difference between pre-program and post-program scores is *statistically significant,* that is, whether such a difference could have occurred because of chance alone. If the probability is small that the results are due to chance, the evaluator can, with reasonable confidence, attribute the results to the program.

Statistical significance, however, does not imply *practical significance.* A small difference between the average scores of two groups can be statistically significant, particularly when large numbers of participants are involved, yet be of no practical consequence whatsoever. Health educators will need to make sensible determinations regarding whether the magnitude of an observed difference, even though statistically significant, is sufficiently important to warrant action. In other words, although evaluators of health education programs should often carry out statistical significance tests, they should not be unduly swayed by the results of such analyses. Common sense must always be applied in interpreting the meaning of a statistically significant result.**

Reporting Results

Reporting the results of an evaluation study is a more difficult undertaking than is usually recognized. Considerable attention must be given to the procedures employed to report the

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* For additional information about sampling procedures, see Annotated Bibliography Nos. 9 and 10.

** For additional information about data analysis, see Annotated Bibliography Nos. 25, 36, 39, 43, and 45.

results of health education program evaluations. When reporting evaluation results, as when focusing and planning the evaluation, the evaluator must be responsive to the needs of program decision makers. A few key considerations should be kept in mind when reporting evaluation results.

Evaluators must report their results to decision makers in a timely fashion. It does no good to deliver an evaluation report several weeks after key program decisions had to be made. Evaluators must also be careful to disseminate their findings to all appropriate audiences. If possible, an evaluator should circulate the preliminary draft of a program evaluation report to program personnel so that they can react to its accuracy and objectivity.

The decision makers whom evaluators are assisting may have scant experience with quantitative data. As a consequence, complicated statistical presentations may be of little value to them. Evaluators should select data presentation procedures that will match the technical sophistication of the decision makers involved. In any evaluation report, there is nothing wrong with simple graphs or "percentage correct" tables. The more intuitively comprehensible the data presentation techniques, the better they are. Program evaluators should provide straightforward presentations of data without fearing that such approaches will be regarded as too elementary. Adequate technical back-up can be appended as necessary to the final report.

Evaluators should not be reluctant to make speculations based upon their knowledge about a program, but these conjectures should be identified as such. Similarly, if any of the evaluation's findings are equivocal, the evaluator should inform concerned audiences of this fact. Honesty and objectivity are the hallmarks of effective evaluation reporting.

In addition, because decision makers are typically busy people, evaluators should strive for reasonable brevity in their reports. The preparation of executive summaries to accompany lengthy reports is a useful practice. Voluminous evaluation reports are almost certainly destined to go unread. Terse, easily read reports are much more likely to make an impact on decision makers.

The whole thrust of the evaluation enterprise is to facilitate better decisions. Decision making will *not* be illuminated by complex, lengthy, or otherwise incomprehensible presentations of evaluation results. The quality of decision making can be enhanced only if an evaluation's results are reported in a way that can be clearly understood.*

Reprise

In this chapter, a number of issues almost certain to be encountered by evaluators of diabetes programs were considered. Because this handbook supplies a number of measures to be used in the evaluation process, special attention was given to the role of such measures

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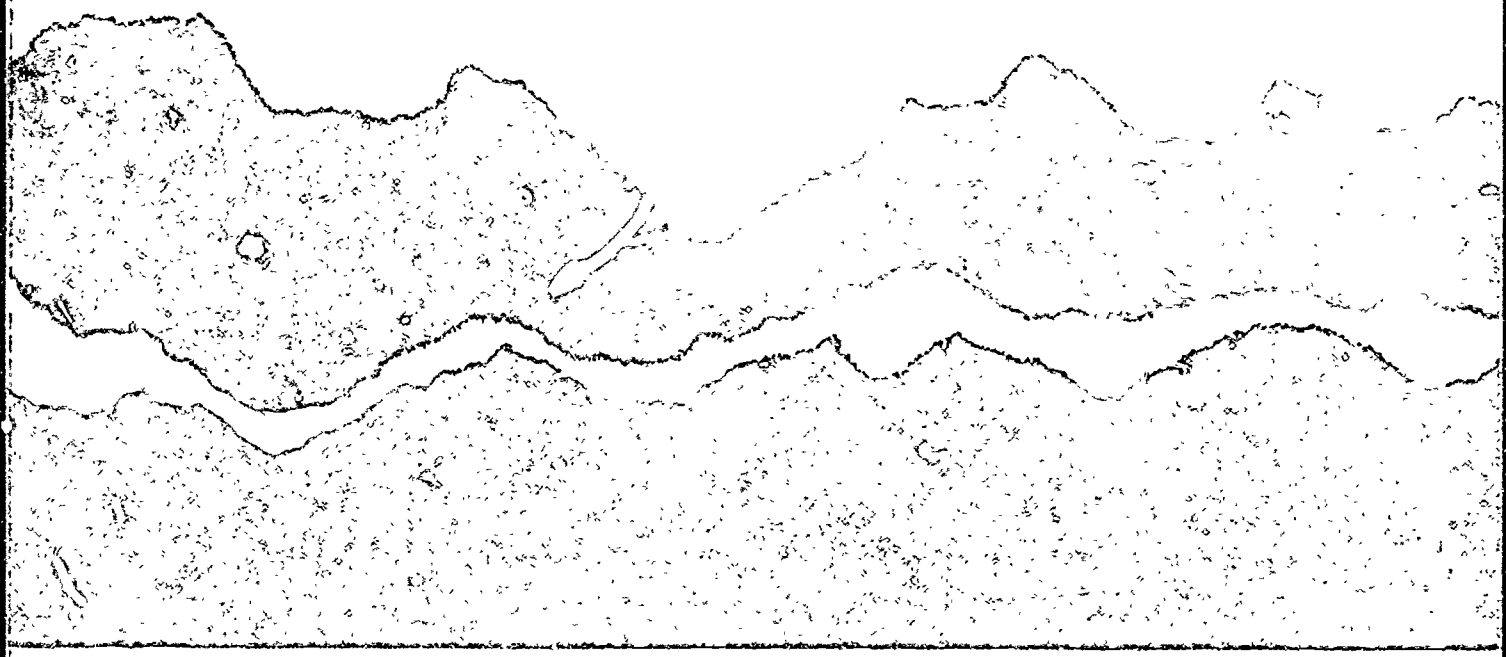
* For additional information about reporting the results of an evaluation, see Annotated Bibliography Nos. 5, 23, 26, and 35.

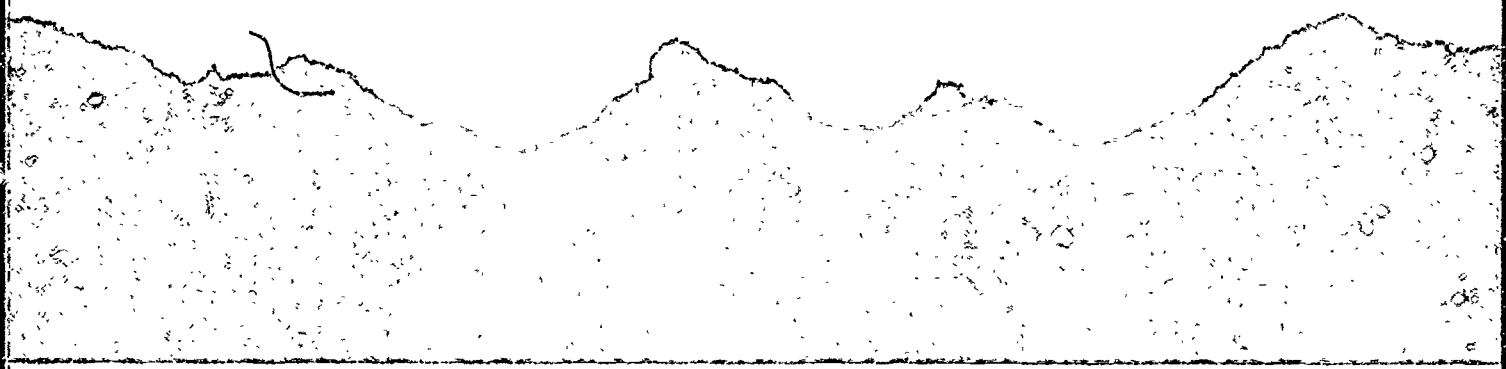
in program evaluation. Evaluators desiring more detailed treatments of the topics covered in this chapter will find appropriate sources in the Annotated Bibliography.*

* For additional information about program evaluation, see Annotated Bibliography Nos. 5, 13, 16, 20, 23, 32, 41, 46, 49, and 51.



CHAPTER THREE

Program Evaluation Measures



Overview of Measures

Category	Title	Target Group	Description	Page No.
Behavior	**Diabetes Management Plan**	Adults	Assesses familiarity with and use of the diabetes management plan.	38
	Your Child's Diabetes Management Plan	Parents who are responsible for the management of their child's diabetes		52
	Your Diabetes Management Plan	Preadolescents who are responsible for their diabetes management		62
	Performance Assessment: Blood Glucose Testing	Adults/Adolescents Preadolescents (Administered by a health care professional)	Assesses ability to demonstrate blood glucose testing.	72
	Performance Assessment: Insulin Injection	Adults/Adolescents Preadolescents (Administered by a health care professional)	Assesses ability to demonstrate insulin injections.	76
Knowledge*	**Diabetes and Its Management**	Adults Adolescents	Assesses knowledge of diabetes and the management of diabetes.	80
	Diabetes	Preadolescents Parents of preadolescents and young children		88

* The information eligible for inclusion in the knowledge measures is provided in Appendix A as amplified content descriptors.

Category	Title	Target Group	Description	Page No.
Knowledge	**The Complications of Diabetes**	Adults Adolescents Parents of preadolescents and young children	Assesses knowledge of the prevention and treatment of the complications of diabetes.	94
	The Problems of Diabetes	Preadolescents		100
	Pregnancy and Diabetes	Women Adolescent girls	Assesses knowledge of pregnancy as it relates to diabetes.	104
Skill	**Management of Diabetes and Its Complications**	Adults	Assesses ability to select appropriate courses of action for managing diabetes and its complications.	108
	Taking Care of Diabetes	Preadolescents Parents of preadolescents and young children		124
Affective	**Diabetes Family Behavior Checklist I**	Adults with Type I diabetes	Assesses perceived support from others for performing diabetes-specific behaviors.	132
	Diabetes Family Behavior Checklist II	Adults with Type II diabetes		136
	Your Family and Friends	Adolescents Preadolescents		141

Category	Title	Target Group	Description	Page No.
Affective	**Feelings About Your Diabetes Management Plan**	Adults	Assesses belief in the effectiveness of the diabetes management plan.	146
	Feelings About Your Diabetes	Adolescents Preadolescents who are responsible for their diabetes management		150
	Can You Manage Your Diabetes?	Adults	Assesses perceived ability to use different components of the diabetes management plan.	154
	Can You Take Care of Your Diabetes?	Adolescents Preadolescents who are responsible for their diabetes management		161
	Intentions Regarding Your Diabetes Management Plan	Adults	Assesses intention to use different components of the diabetes management plan for the next 12 months.	167
	Will You Try to Take Care of Your Diabetes?	Adolescents Preadolescents who are responsible for their diabetes management		172
Demographic	**General Information Form**	Adults	Assesses general information for demographic purposes.	177

DIABETES MANAGEMENT PLAN

This behavior measure assesses participants' familiarity with the components of their diabetes management plan and the extent to which the management plan is implemented. This measure is appropriate for adults. If this measure seems useful, program personnel may also want to consider administering **Intentions Regarding Your Diabetes Management Plan,** which is an affective measure assessing participants' *intention* to use their diabetes management plan for the next 12 months.

PURPOSE

Information regarding participants' familiarity with and use of the diabetes management plan may be helpful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results from this measure may indicate that program participants are not sufficiently familiar with or are not consistently following their diabetes management plans.
- When the measure is administered prior to and following a program, it is possible to evaluate changes in participants' behavior.

PROCEDURES

This measure can be administered both at the beginning and at the end of a program. For programs that are shorter than 30 days in duration, program personnel may want to administer the measure only at the beginning of the program. However, if program personnel choose to administer this instrument at the beginning and at the end of a program to measure pretest to posttest changes, the instructions that include the term "past 30 days" can be changed to read "last week."

SCORING AND ANALYSIS

Items 1, 2, 4, 5, 7, 8, 10, 11, 12, 14, 15, 17, 18, 20, 21, 23, 25, 26, 28, 30, 32, 34, 36, 37, 38, 40, and 42 are not scored.

For items 3, 6, 9, 13, 16, 19, 24, 29, 31, 33, 35, 39, 41, and 43, point values are assigned to responses as follows:

Always	=	6
Almost Always	=	5
Usually	=	4
Sometimes	=	3
Rarely	=	2
Never	=	1

Note: Item 6 consists of five sets of responses. Point values should be assigned to each response.

This measure can be scored by adding the point values of the scored responses from all participants and dividing this total by the number of scored responses. Blank items and items in which participants indicate that the question does not apply (for example, "I have not had any vision problems") should not be counted in the number of responses. The maximum attainable score of 6 points indicates consistent use of the diabetes management plan in the past 30 days. A minimum attainable score of 1 point indicates noncompliance with the diabetes management plan in the past 30 days.

Items 21 and 22, as well as items 26 and 27, should be scored together. The responses to item 22 should be compared with the responses to item 21, which in turn should be compared with the medical records. This procedure should be repeated for items 26 and 27.

Program personnel also may want to examine the accuracy of participants' recall of their diabetes management plans. Participants' responses to items 2, 5, 8, 11, 12, 15, 18, and 38 can be compared with information provided in the medical records.

Date: _____

Name: _____

DIABETES MANAGEMENT PLAN

Please answer the following questions about the diabetes management plan designed by you and your health care team. Complete the information as you remember it. Please do not refer to any notes.

1. Is taking insulin part of your diabetes management plan?

   ( ) Yes, I take insulin injections. (Go to question 2)

   ( ) Yes, I use an insulin pump. (Go to question 10)

   ( ) No (Go to question 7)

2. Complete the chart below using the information from your diabetes management plan. Indicate the time(s) of day, the type of insulin, and the amount of insulin for each planned injection. If you don't remember this information, write a question mark (?) in the appropriate box.

Time of day	Type of insulin (such as regular, NPH, Ultralente)	Amount of insulin (in units)

3. Think back over the past 30 days. On days when insulin adjustments were not necessary, how often did you take your insulin as described in your management plan?

   ( ) Always
   ( ) Almost always
   ( ) Usually
   ( ) Sometimes
   ( ) Rarely
   ( ) Never

4. Have you been instructed to adjust your insulin dose when your daily routine changes?

   ( ) Yes (Go to question 5)
   ( ) No (Go to question 10)
   ( ) Don't know (Go to question 10)

5. What changes in your *insulin*, if any, have you been instructed to make when you:

   are sick? _____

   _____

   _____

   increase your activity level? _____

   _____

   _____

   change the amount of food you eat? _____

   _____

   _____

   have high blood sugar for several days? _____

   _____

   _____

   have low blood sugar for several days? _____

   _____

   _____

6. Think back over the past 30 days. When the situations described in #5 occurred, how often did you make the specified changes?

	Situation did not occur	Always	Almost always	Usually	Some-times	Rarely	Never
Sick							
Increase in activity level							
Change in amount of food							
High blood sugar for several days							
Low blood sugar for several days							

7. Is taking diabetes pills (oral hypoglycemics) part of your diabetes management plan?

( ) Yes (Go to question 8)

( ) No (Go to question 10)

8. Fill in the information below according to your diabetes management plan. Indicate the name and strength of your diabetes pills and how often you are supposed to take them. If you don't remember this information, write a question mark (?) on the appropriate line.

Name of pills: _____

Strength of pills in milligrams: _____

Number of pills a day: _____

Time(s) pills are taken: _____

9. In the past 30 days, how often did you take your diabetes pills as described in your management plan?

   ( ) Always
   ( ) Almost always
   ( ) Usually
   ( ) Sometimes
   ( ) Rarely
   ( ) Never

10. Is testing your sugar levels part of your diabetes management plan?

    ( ) Yes (Go to question 11)
    ( ) No (Go to question 14)
    ( ) Don't know (Go to question 14)

11. According to your diabetes management plan, how many days a week should you use the tests below to check your sugar levels? If you don't use one of the tests, write DON'T USE on the appropriate line.

    blood sugar test _____ (days per week)
    urine sugar test _____ (days per week)

12. On the days you test your sugar levels, how many times per day should you test?

    blood sugar test _____ (times per day)
    urine sugar test _____ (times per day)

13. In the past 30 days, how often did you test your sugar levels as described in your management plan?

    ( ) Always
    ( ) Almost always
    ( ) Usually
    ( ) Sometimes
    ( ) Rarely
    ( ) Never

14. Is testing your urine ketone levels part of your diabetes management plan?

( ) Yes (Go to question 15)
( ) No (Go to question 17)
( ) Don't know (Go to question 17)

15. According to your diabetes management plan, how often should you test your urine ketone levels?

(*Check all that apply*)

( ) When sick
( ) When blood sugar levels are high
( ) When on a weight loss diet
( ) On a regular schedule (such as daily or weekly)

16. In the past 30 days, how often did you test your urine ketone levels as described in your management plan?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Rarely
( ) Never

17. Does your management plan include exercise or physical activity?

( ) Yes (Go to question 18)
( ) No (Go to question 20)
( ) Don't know (Go to question 20)

18. What is your exercise plan?

_____

_____

_____

_____

_____

_____

19. In the past 30 days, how often did you engage in exercise as described in your management plan?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Rarely
( ) Never

20. Does your diabetes management plan include checking your feet for signs of problems?

( ) Yes (Go to question 21)
( ) No (Go to question 23)
( ) Don't know (Go to question 23)

21. According to your management plan, how often should you check your feet?

( ) Every day
( ) Every few days
( ) About once a week
( ) About once a month

22. In the past 30 days, how often did you check your feet?

( ) Every day
( ) Every few days
( ) About once a week
( ) About once a month

23. According to your management plan, should you report infections (skin or foot infections) to your doctor?

( ) Yes (Go to question 24)
( ) No (Go to question 25)
( ) Don't know (Go to question 25)

24. How often do you report infections to your doctor?

( ) I have not had any infections.
( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Rarely
( ) Never

25. Does your diabetes management plan include having your eyes checked by an ophthalmolcgist?

( ) Yes (Go to question 26)
( ) No (Go to question 28)

26. According to your plan, how often should your eyes be checked by an ophthalmologist?

( ) More often than once every six months
( ) Once every six months
( ) Once every year
( ) Once every two years
( ) Less often than once every two years
( ) Don't know

27. How often are your eyes checked by an ophthalmologist?

( ) More often than once every six months
( ) Once every six months
( ) Once every year
( ) Once every two years
( ) Less often than once every two years

28. According to your management plan, should you report vision problems to your doctor?

( ) Yes (Go to question 29)
( ) No (Go to question 30)
( ) Don't know (Go to question 30)

29. How often do you report vision problems to your doctor?

( ) I have not had any vision problems.
( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Rarely
( ) Never

30. In the past 30 days, did you have serious low blood sugar reactions *with symptoms* such as confusion, dizziness, or sweating?

( ) Yes
( ) No
( ) Don't know

31. How often do you record serious low blood sugar reactions and discuss them with your doctor at your regular visit?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Rarely
( ) Never

32. Have you been told what to do about low blood sugar reactions?

( ) Yes
( ) No
( ) Don't know

33. How often do you keep some form of sugar available in case of low blood sugar reactions?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Rarely
( ) Never

34. In the past 30 days, did you have serious high blood sugar *with symptoms* such as thirst, nausea, or tiredness?

( ) Yes
( ) No
( ) Don't know

35. How often do you record serious high blood sugars and discuss them with your doctor at your regular visit?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Rarely
( ) Never

36. Have you been told what to do about high blood sugar?

( ) Yes
( ) No
( ) Don't know

37. Does your diabetes management plan include following a special diet or meal plan?

( ) Yes (Go to question 38)
( ) No (You have completed this survey. Thank you.)
( ) Don't know (You have completed this survey. Thank you.)

38. What is your meal plan?

39. In the past 30 days, how often did you follow your meal plan (eat only the right foods in the right amounts)?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Rarely
( ) Never

40. Does your meal plan include a schedule with specific times for meals and snacks?

( ) Yes (Go to question 41)
( ) No (Go to question 42)
( ) Don't know (Go to question 42)

41. In the past 30 days, how often did you follow the schedule for your meals and snacks?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Rarely
( ) Never

42. Does your meal plan include limiting daily calories to control your weight?

( ) Yes (Go to question 43)
( ) No (You have completed this survey. Thank you.)
( ) Don't know (You have completed this survey. Thank you.)

43. In the past 30 days, how often did you limit your daily calories?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Rarely
( ) Never

You have completed this survey. Thank you.

YOUR CHILD'S DIABETES MANAGEMENT PLAN

This behavior measure assesses parents' familiarity with the components of their child's diabetes management plan and the extent to which the management plan is implemented. This measure is appropriate for parents who are responsible for the management of their child's diabetes.

PURPOSE

Information regarding parents' familiarity with and use of the diabetes management plan may be helpful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results from this measure may indicate that program participants are not sufficiently familiar with or are not consistently following the diabetes management plans designed for their children.
- When the measure is administered prior to and following a program, it is possible to evaluate change in participants' behavior.

PROCEDURES

This measure can be administered both at the beginning and at the end of a program. For programs that are shorter than two weeks in duration, program personnel may want to administer the measure only at the beginning of the program. However, if program personnel choose to administer this instrument at the beginning and at the end of a program to measure pretest to posttest changes, the instructions that include the term "last two weeks" can be changed to read "last week."

SCORING AND ANALYSIS

Items 1, 2, 4, 5, 7, 8, 10, 11, 13, 15, 17, 18, 20, 22, 23, 26, 27, 29, and 31 are not scored.

For items 3, 6, 9, 12, 14, 16, 21, 24, 25, 28, 30, and 32, point values are assigned to responses as follows:

Always	=	6
Almost Always	=	5
Usually	=	4
Sometimes	=	3
Hardly Ever	=	2
Never	=	1

This measure can be scored by adding the point values of the scored responses from all participants and dividing this total by the number of scored responses. Blank items and items in which participants indicate that the question does not apply (for example, "My child has not had any eye problems") should not be counted in the number of responses. The maximum attainable score of 6 points indicates consistent use of the diabetes management plan in the last two weeks. A minimum attainable score of 1 point indicates noncompliance with the diabetes management plan in the last two weeks.

Items 18 and 19 should be scored together. The responses to item 19 should be compared with the responses to item 18, which in turn should be compared with the children's medical records.

Program personnel also may want to examine the accuracy of participants' recall of their children's diabetes management plans. Participants' responses to items 2, 8, and 11 can be compared with information provided in the children's medical records.

Date: _____

Name: _____

Child's age: _____

YOUR CHILD'S DIABETES MANAGEMENT PLAN

Please answer the following questions about your child's diabetes management plan. Complete the information as you remember it. Please do not refer to any notes.

1. Do you give your child insulin shots?
   ( ) Yes (Go to question 2)
   ( ) No (Go to question 7)

2. Fill in the chart below with the information you were taught about giving insulin shots. Write the time(s) of day, the type of insulin, and the amount of insulin for each shot your child needs. If you don't remember something, write a question mark (?) on the answer line. Leave the lines blank that do not apply.

Morning:	_____ a.m.	Type of insulin:	_____	Amount:	_____
		Type of insulin:	_____	Amount:	_____
Afternoon:	_____ p.m.	Type of insulin:	_____	Amount:	_____
		Type of insulin:	_____	Amount:	_____
Evening:	_____ p.m.	Type of insulin:	_____	Amount:	_____
		Type of insulin:	_____	Amount:	_____
Other:	_____	Type of insulin:	_____	Amount:	_____
		Type of insulin:	_____	Amount:	_____

3. In the last two weeks, how often did you give your child insulin shots as you were taught?

   ( ) Always
   ( ) Almost always
   ( ) Usually
   ( ) Sometimes
   ( ) Hardly ever
   ( ) Never

4. Have you been taught how to change your child's insulin dose?

   ( ) Yes (Go to question 5)
   ( ) No (Go to question 7)
   ( ) Don't know

5. In the last two weeks, did you need to make any changes in your child's insulin dose?

   ( ) Yes (Go to question 6)
   ( ) No (Go to question 7)
   ( ) Don't know (Go to question 7)

6. In the last two weeks, how often did you make changes in your child's dose when you needed to?

   ( ) Always
   ( ) Almost always
   ( ) Usually
   ( ) Sometimes
   ( ) Hardly ever
   ( ) Never

7. Have you been taught how to test your child's sugar levels?

   ( ) Yes (Go to question 8)
   ( ) No (Go to question 10)
   ( ) Don't know (Go to question 10)

8. How often are you supposed to test your child's sugar levels? If you don't use one of the tests, write DON'T USE in the answer space.

   blood sugar test _____ (times per day)
   urine sugar test _____ (times per day) or _____ (times per week)

9. In the last two weeks, how often did you test your child's sugar levels as you were taught?

   ( ) Always
   ( ) Almost always
   ( ) Usually
   ( ) Sometimes
   ( ) Hardly ever
   ( ) Never

10. Have you been taught how to test your child's urine ketone levels?

    ( ) Yes (Go to question 11)
    ( ) No (Go to question 13)
    ( ) Don't know (Go to question 13)

11. How often are you supposed to test your child's urine ketone levels?

    (Check all that apply)

    ( ) When sick
    ( ) When blood sugar levels are high
    ( ) On a regular schedule (such as daily or weekly)

12. In the last two weeks, how often did you test your child's urine ketone levels as you were taught?

    ( ) I did not need to test my child's urine ketone levels.
    ( ) Always
    ( ) Almost always
    ( ) Usually
    ( ) Sometimes
    ( ) Hardly ever
    ( ) Never

13. Has your child been told to follow a regular exercise program?

( ) Yes (Go to question 14)
( ) No (Go to question 15)
( ) Don't know (Go to question 15)

14. In the last two weeks, how often did your child follow the exercise program given?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

15. Were you told to report any skin or foot infections that your child has to the doctor?

( ) Yes (Go to question 16)
( ) No (Go to question 17)
( ) Don't know (Go to question 17)

16. How often do you report your child's infections to the doctor?

( ) My child has not had any infections.
( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

17. Were you told to have your child's eyes checked by an ophthalmologist?

( ) Yes (Go to question 18)
( ) No (Go to question 20)
( ) Don't know (Go to question 20)

18. How often are you supposed to have your child's eyes checked by an ophthalmologist?

( ) Once every six months
( ) Once every year
( ) Once every two years
( ) Less often than once every two years
( ) Don't know

19. How often do you have your child's eyes checked by an ophthalmologist?

( ) Once every six months
( ) Once every year
( ) Once every two years
( ) Less often than once every two years

20. Were you told to report any eye problems your child has to the doctor?

( ) Yes (Go to question 21)
( ) No (Go to question 22)
( ) Don't know (Go to question 22)

21. How often do you report eye problems your child has to the doctor?

( ) My child has not had any eye problems.
( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

22. Have you been taught what to do about insulin reactions?

( ) Yes
( ) No
( ) Don't know

23. In the last two weeks, did your child have any serious insulin reactions *with symptoms* such as confusion, weakness, or sweating?

( ) Yes
( ) No
( ) Don't know

24. How often do you record your child's serious insulin reactions and discuss them with the doctor at your regular visit?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

25. How often is some form of sugar immediately available in case your child has an insulin reaction?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

26. Have you been taught what to do about high blood sugar?

( ) Yes
( ) No
( ) Don't know

27. In the last two weeks, has your child had serious high blood sugar *with symptoms* such as thirst, nausea, or tiredness?

( ) Yes
( ) No
( ) Don't know

28. How often do you record your child's serious high blood sugars and discuss them with the doctor at your regular visit?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

29. Were you taught that your child needs to follow a special meal plan?

( ) Yes (Go to question 30)
( ) No (You have finished this survey. Thank you.)
( ) Don't know (You have finished this survey. Thank you.)

30. In the last two weeks, how often did your child follow the special meal plan?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

31. Does your child's meal plan include eating meals and snacks at about the same times each day?

( ) Yes (Go to question 32)
( ) No (You have finished this survey. Thank you.)
( ) Don't know (You have finished this survey. Thank you.)

32. In the last two weeks, how often did your child eat meals and snacks at the right times?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

You have finished this survey. Thank you.

YOUR DIABETES MANAGEMENT PLAN

This behavior measure assesses participants' familiarity with the components of their diabetes management plan and the extent to which the management plan is implemented. This measure is appropriate for adolescents and preadolescents who are responsible for their diabetes management. If this measure seems useful, program personnel may also want to consider administering **Will You Try to Take Care of Your Diabetes?**, which is an affective measure assessing participants' *intention* to use their diabetes management plan for the next 12 months.

PURPOSE

Information regarding participants' familiarity with and use of the diabetes management plan may be helpful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results from this measure may indicate that program participants are not sufficiently familiar with or are not consistently following their diabetes management plans.
- When the measure is administered prior to and following a program, it is possible to evaluate changes in participants' behavior.

PROCEDURES

This measure can be administered both at the beginning and at the end of a program. For programs that are shorter than two weeks in duration, program personnel may want to administer the measure only at the beginning of the program. However, if program personnel choose to administer this instrument at the beginning and at the end of a program to measure pretest to posttest changes, the instructions that include the term "last two weeks" can be changed to read "last week."

SCORING AND ANALYSIS

Items 1, 2, 4, 5, 7, 8, 10, 11, 13, 15, 17, 18, 20, 22, 23, 26, 27, 29, and 31 are not scored.

For items 3 and 30, point values are assigned to responses as follows:

Always	=	1
Almost Always	=	2
Usually	=	3
Sometimes	=	4
Hardly Ever	=	5
Never	=	6

For items 6, 9, 12, 14, 16, 21, 24, 25, 28, and 32, point values are assigned to responses as follows:

Always	=	6
Almost Always	=	5
Usually	=	4
Sometimes	=	3
Hardly Ever	=	2
Never	=	1

This measure can be scored by adding the point values of the scored responses from all participants and dividing this total by the number of scored responses. Blank items and items in which participants indicate that the question does not apply (for example, "I have not had any eye problems") should not be counted in the number of responses. The maximum attainable score of 6 points indicates consistent use of the diabetes management plan in the last two weeks. A minimum attainable score of 1 point indicates noncompliance with the diabetes management plan in the last two weeks.

Items 18 and 19 should be scored together. The responses to item 19 should be compared with the responses to item 18, which in turn should be compared with the medical records.

Program personnel also may want to examine the accuracy of participants' recall of their diabetes management plans. Participants' responses to items 2, 8, and 11 can be compared with information provided in the medical records.

Date: _____

Name: _____

Age: _____

YOUR DIABETES MANAGEMENT PLAN

Try to remember what you were taught to do to take care of your diabetes. Then write down as much as you remember for each question. Please do not use any notes.

1. Do you give yourself insulin shots?
   ( ) Yes (Go to question 2)
   ( ) No (Go to question 7)

2. Fill in the chart below with the information you were taught about taking your shots. Write the time(s) of day, the type of insulin, and the amount of insulin for each shot you need. If you don't remember something, write a question mark (?) on the answer line. Leave the lines blank that do not apply to you.

Morning:	_____ a.m.	Type of insulin:	_____	Amount:	_____
		Type of insulin:	_____	Amount:	_____
Afternoon:	_____ p.m.	Type of insulin:	_____	Amount:	_____
		Type of insulin:	_____	Amount:	_____
Evening:	_____ p.m.	Type of insulin:	_____	Amount:	_____
		Type of insulin:	_____	Amount:	_____
Other:	_____	Type of insulin:	_____	Amount:	_____
		Type of insulin:	_____	Amount:	_____

3. In the last two weeks, how often did you *forget* your insulin shot?

   ( ) Always
   ( ) Almost always
   ( ) Usually
   ( ) Sometimes
   ( ) Hardly ever
   ( ) Never

4. Have you been taught how to change your insulin shots?

   ( ) Yes (Go to question 5)
   ( ) No (Go to question 7)
   ( ) Don't know

5. In the last two weeks, did you need to make any changes in your insulin shots?

   ( ) Yes (Go to question 6)
   ( ) No (Go to question 7)
   ( ) Don't know (Go to question 7)

6. In the last two weeks, how often did you make changes in your insulin shots when you needed to?

   ( ) Always
   ( ) Almost always
   ( ) Usually
   ( ) Sometimes
   ( ) Hardly ever
   ( ) Never

7. Have you been taught how to test your sugar levels?

   ( ) Yes (Go to question 8)
   ( ) No (Go to question 10)
   ( ) Don't know

8. How often are you supposed to test your sugar levels? If you don't use one of the tests, write DON'T USE in the answer space.

   blood sugar test _____ (times per day)

   urine sugar test _____ (times per day) or _____ (times per week)

9. In the last two weeks, how often did you test your sugar levels as you were taught?

   ( ) Always
   ( ) Almost always
   ( ) Sometimes
   ( ) Hardly ever
   ( ) Never

10. Have you been taught how to test your urine ketone levels?

    ( ) Yes (Go to question 11)
    ( ) No (Go to question 13)
    ( ) Don't know

11. How often are you supposed to test your urine ketone levels?

    (*Check all that apply*)

    ( ) When sick
    ( ) When blood sugar levels are high
    ( ) On a regular schedule (such as daily or weekly)

12. In the last two weeks, how often did you test your urine ketone levels as you were taught?

    ( ) I did not need to test my urine ketone levels.
    ( ) Always
    ( ) Almost always
    ( ) Usually
    ( ) Sometimes
    ( ) Hardly ever
    ( ) Never

13. Have you been told to exercise regularly?

( ) Yes (Go to question 14)
( ) No (Go to question 15)
( ) Don't know

14. In the last two weeks, how often did you exercise as you are supposed to?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

15. Were you told to report skin or foot infections to your doctor?

( ) Yes (Go to question 16)
( ) No (Go to question 17)
( ) Don't know

16. How often do you report infections to your doctor?

( ) I have not had any infections.
( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

17. Were you told to have your eyes checked by an ophthalmologist?

( ) Yes (Go to question 1)
( ) No (Go to question 0)
( ) Don't know

18. How often are you supposed to have your eyes checked by an ophthalmologist?

( ) Once every six months
( ) Once every year
( ) Once every two years
( ) Less often than once every two years
( ) Don't know

19. How often do you have your eyes checked by an ophthalmologist?

( ) Once every six months
( ) Once every year
( ) Once every two years
( ) Less often than once every two years

20. Were you told to report eye problems to your doctor?

( ) Yes (Go to question 21)
( ) No (Go to question 22)
( ) Don't know

21. How often do you report eye problems to your doctor?

( ) I have not had any eye problems.
( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

22. Have you been taught what to do about insulin reactions?

( ) Yes
( ) No
( ) Don't know

23. In the last two weeks, did you have serious insulin reactions that made you feel hungry, sweaty, or weak?

( ) Yes
( ) No
( ) Don't know

24. How often do you write down serious insulin reactions and discuss them with your doctor at your regular visit?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

25. How often do you keep some form of sugar with you in case of insulin reactions?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

26. Have you been taught what to do about high blood sugar?

( ) Yes
( ) No
( ) Don't know

27. In the last two weeks, have you had serious high blood sugar that made you feel thirsty, sick to your stomach, or tired?

( ) Yes
( ) No
( ) Don't know

28. How often do you write down serious high blood sugars and discuss them with your doctor at your regular visit?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

29. Were you taught to follow a special meal plan to help take care of your diabetes?

( ) Yes (Go to question 30)
( ) No (You have finished this survey. Thank you.)
( ) Don't know (You have finished this survey. Thank you.)

30. In the last two weeks, how often did you eat foods that you are *not* supposed to?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

31. Does your meal plan include eating meals and snacks at about the same times each day?

( ) Yes (Go to question 32)
( ) No (You have finished this survey. Thank you.)
( ) Don't know (You have finished this survey. Thank you.)

32. In the last two weeks, how often did you eat your meals and snacks when you were supposed to?

( ) Always
( ) Almost always
( ) Usually
( ) Sometimes
( ) Hardly ever
( ) Never

You have finished this survey. Thank you.

PERFORMANCE ASSESSMENT: BLOOD GLUCOSE TESTING

This behavior measure assesses participants' ability to demonstrate blood glucose testing. This measure is administered by a health professional to individuals who are expected to test blood sugar levels.

PURPOSE

Program participants who are expected to test blood sugar levels must be able to do so properly. This measure allows program personnel to effectively judge whether participants can perform the behavior correctly.

PROCEDURES

The current technique of blood glucose testing involves placing a drop of blood on a chemical testing strip that reacts to the amount of sugar in the blood. These strips can be read either by visual comparison to a color chart or by a meter. There are a variety of testing strips and meters available, which are often updated and improved.

The first page of the measure includes a step-by-step checklist for placing blood on a testing strip and visually comparing the strip to a color chart. A health professional should read the checklist carefully, making sure that the steps presented are appropriate for the testing strip the individual will be using. The checklist should be changed as needed.

The second page of the measure is an observation checklist to assess use of the blood glucose meter. The checklist includes general directions for meter usage. Prior to the observation, a health professional should review the specific times and step-by-step instructions for the meter the individual will be demonstrating. Any changes or notes should be written on the checklist.

A health professional should carefully observe the individual's performance during the demonstration. A check (√) should be placed in the "YES" column if the individual correctly performs the step. A check (√) should be placed in the "NO" column if the individual forgets the step or performs it incorrectly. Comments about the demonstration should be noted in the column provided. The individual who has problems during the demonstration should be given assistance and asked to demonstrate the procedure again.

The individual should be given a device for puncturing the finger (e.g., lancet, stylet, etc.), cotton balls, the appropriate meter with testing strips and any necessary calibration solutions, and a watch with a second hand. This measure should be administered only after individuals have received instruction about blood glucose testing.

SCORING AND ANALYSIS

The measure can be scored in three ways:

- To determine the percentage of program participants who completed the demonstration correctly, first count number of participants who completed all of

the steps correctly, that is, received a check (√) in the "YES" column next to each step. Divide this number by the total number of participants. A high percentage indicates that the majority of program participants can correctly demonstrate blood glucose testing. A low percentage indicates that few program participants can correctly demonstrate blood glucose testing.

- To determine the percentage of program participants who completed the demonstration with assistance, first count the number of participants who completed some of the steps incorrectly, that is, first received a check (√) in the "NO" column next to a step. Divide this number by the total number of participants. A high percentage indicates that the majority of program participants require assistance in order to correctly demonstrate blood glucose testing. A low percentage indicates that few program participants require assistance with blood glucose testing.
- Calculate the mean score to determine the amount of assistance program participants required. For each participant who required assistance, count the number of steps that were completed incorrectly on the first try, that is, first received a check (√) in the "NO" column. Add the scores for the group and divide by the total number of participants who required assistance. A large number indicates that those participants who require assistance need a great deal of help. A small number indicates that those participants who require assistance need only minor help.

PERFORMANCE ASSESSMENT: BLOOD GLUCOSE TESTING

Date: _____

Name of Individual Being Observed: _____

USING A TESTING STRIP AND COMPARING IT TO A CHART	Yes	No	Comments
Ask the individual to demonstrate the use of a testing strip. Does the individual: a. assemble all necessary materials prior to starting the test?			
b. wash his/her hands?			
c. correctly use the selected method to puncture finger?			
d. obtain blood from the side of the fingertip?			
e. place a large drop of blood onto the strip covering the reagent area completely?			
f. wait specified time?			
g. remove blood according to manufacturer's recommendation?			
h. wait specified time?			
i. compare the testing strip to color chart?			
j. read the chart correctly?			
k. If recommended by manufacturer, wait additional time for blood sugar levels greater than 240 mg/dl and then repeat steps i and j. (*Leave blank if blood sugar level is not greater than 240 mg/dl.*)			
l. record reading in log book?			
m. throw away the used materials?			

Date: _____

Name of Individual Being Observed: _____

Name of Meter: _____

USING A METER	Yes	No	Comments
Ask the individual to demonstrate the use of the selected meter. Does the individual: a. assemble all necessary materials prior to starting the test?			
b. wash his/her hands?			
c. turn on meter?			
d. verify calibration, if necessary? (*Leave blank if calibration is not necessary.*)			
e. correctly use the selected method to puncture finger?			
f. obtain blood from the side of the fingertip?			
g. activate meter and apply blood to strip appropriately and within the time limit?			
h. remove blood at appropriate signal?			
i. place strip into meter correctly and within the time limit?			
j. read the results correctly?			
k. record results in log book?			
l. throw away the used materials?			

PERFORMANCE ASSESSMENT: INSULIN INJECTION

This behavior measure assesses participants' ability to demonstrate insulin injections. This measure is administered by a health professional to individuals who are expected to give insulin injections.

PURPOSE

Program participants who are expected to give insulin injections must be able to do so properly. This measure allows program personnel to effectively judge whether participants can demonstrate the behavior correctly.

PROCEDURES

Important Note: This measure should be administered only after individuals have received instruction about insulin injections. The observation should be completed at a time when the individual is scheduled for an insulin injection.

The measure should be administered in a location that is equipped with a sink and a waste disposal container. The individual should be given alcohol pads, bottles of insulin, and syringes.

The measure is comprised of three sections: **Preparation for the Injection, Demonstration of the Injection, and Disposal of the Syringe.** For each section, a health professional should carefully observe the individual as he/she demonstrates the steps listed. A check (√) should be placed in the "YES" column if the individual correctly demonstrates the step. A check (√) should be placed in the "NO" column if the individual forgets the step or demonstrates it incorrectly. Comments about the demonstration should be noted in the column provided.

In Section I, **Preparation for the Injection**, all check marks must be placed in the "YES" column before the individual continues to Section II. Any step that is not properly demonstrated or is forgotten (marked "NO") should be discussed with the patient and repeated.

In Section II, **Demonstration of an Injection,** any corrections should be made during the demonstration. The individual who has difficulty or forgets any steps should repeat the insulin injection at the next meeting.

SCORING AND ANALYSIS

The measure can be scored in three ways:

- To determine the percentage of program participants who completed the demonstration correctly, first count the number of participants who completed all of the steps correctly, that is, received a check (√) in the "YES" column next to each step. Divide this number by the total number of participants. A high percentage

indicates that the majority of program participants can correctly demonstrate insulin injections. A low percentage indicates that few program participants can correctly demonstrate insulin injections.

- To determine the percentage of program participants who completed the demonstration with assistance, first count the number of participants who completed some of the steps incorrectly, that is, first received a check (√) in the "NO" column next to a step. Divide this number by the total number of participants. A high percentage indicates that the majority of program participants require assistance in order to correctly demonstrate insulin injections. A low percentage indicates that few program participants require assistance with insulin injections.
- Calculate the mean score to determine the amount of assistance program participants required. For each participant who required assistance, count the number of steps that were completed incorrectly on the first try, that is, first received a check (√) in the "NO" column. Add these scores for the group and divide by the total number of participants who required assistance. A large number indicates that those participants who require assistance need a great deal of help. A small number indicates that those participants who require assistance need only minor help.

PERFORMANCE ASSESSMENT: INSULIN INJECTION

Date: _____

Name of Individual Being Observed: _____

Record the individual's scheduled dosage of insulin from the medical records:

Dosage: **Type** _____ **Amount** _____
Type _____ **Amount** _____

SECTION I: PREPARATION FOR THE INJECTION	Yes	No	Comments
Ask the individual to demonstrate preparing an injection. Does the individual: a. wash his/her hands?			
b. select the correct insulin?			
c. roll each bottle between the palms to mix the contents?			
d. swab each bottle top with alcohol?			
e. select the correct syringe?			
f. insert air as needed? One Insulin: Was air equal to the amount of insulin needed drawn into the needle and then injected into the bottle?			
Mixed Insulin: Was air equal to the amount of insulin needed from each bottle injected into the appropriate bottles?			
g. inject the needle into the bottle and then turn the bottle upside down to withdraw the insulin?			
h. make sure there were no air bubbles in the syringe?			
i. tap the side of the syringe barrel to make any air rise out of the syringe, if necessary? (*Leave blank if no air bubbles are present.*)			
j. withdraw the correct amount of insulin from the bottle(s)?			

SECTION II: DEMONSTRATION OF AN INJECTION	Yes	No	Comments
Ask the individual to identify injection sites and describe the rotation system. Can the individual: a. name 3 injection sites?			
b. describe the system for rotation?			
Ask the individual to perform an injection. Does the individual: a. inspect the injection site?			
b. swab the site with alcohol?			
c. grasp the injection site? (bunch or spread the skin as needed)			
d. inject the syringe at a 60-90° angle?			
e. push the needle all the way into the skin?			
f. push the plunger all the way down?			
g. withdraw the needle quickly?			
h. swab the site with alcohol and gently apply pressure?			
SECTION III: DISPOSAL OF THE SYRINGE			
Ask the patient to dispose of the needle. Does the patient destroy and throw away the needle or explain the procedure for disposal?			

DIABETES AND ITS MANAGEMENT
(FORMS A & B)

This knowledge measure examines what participants know about diabetes and the management of diabetes. This measure is comprised of three sections. Section I is completed by all respondents; Section II is appropriate only for those respondents who take insulin; Section III should only be completed by those respondents who take pills for their diabetes. **Diabetes and Its Management** is appropriate for adults and adolescents.

PURPOSE

Information regarding participants' knowledge of diabetes and its management may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants do not know about certain aspects of diabetes management. Decisions about how to allocate instructional time can then be made based on this information.
- When the measure is administered prior to and following a program, it is possible to evaluate changes in participants' knowledge.

PROCEDURES

Because the equidifficulty of the forms has not been established, it is best not to give all participants Form A as a pretest and Form B as a posttest. Instead, choose either of the following methods.

- Review Forms A and B and select one. Give all participants the selected form both before and after the program. Alternatively, select individual items or entire sections on the two forms and construct a measure most consistent with program emphases. For example, if all program participants need to take insulin and not diabetes pills, as in an adolescent program, Section III of the measure dealing with diabetes pills need not be given. Administer the "new" form both before and after the program.
- Give Form A to half of the incoming participants and Form B to the remaining half. To distribute the forms randomly, order them "ABABAB" and hand them out. Following the program, give each participant the form not previously taken. For example, if a participant was given Form B before the program, then that participant should be given Form A following the program. This approach eliminates the possibility that examinees will be sensitized to the specific facts to be learned from the program.

SCORING AND ANALYSIS

The answer keys for the two forms are provided below:

Item No.	Form A	Form B
	Section I	
1	Yes	No
2	No	Yes
3	No	No
4	Yes	Yes
5	Yes	Yes
6	Yes	No
7	No	No
8	Yes	Yes
9	No	Yes
10	No	No
11	Yes	No
12	No	Yes
13	Yes	No
14	No	Yes
15	No	Yes
	Section II	
1	Yes	No
2	No	Yes
3	Yes	Yes
	Section III	
1	No	No
2	No	No
3	Yes	Yes

The measures should be scored *by section*. For each participant, count the number of correct answers in each completed section. Items that should have been answered but were left blank or marked "Don't Know" should be scored as incorrect. For each section, count the number of correct answers for each participant. Next, total the correct answers for the group and divide by the number of participants in the group. The mean number of correct answers and the standard deviation can be used to summarize participant performance for each section. Means and standard deviations from before and after the program can be compared to determine changes in participants' knowledge.

DIABETES AND ITS MANAGEMENT

Form A

This test is about diabetes and its management. Put a check to show whether you think the answer to each question is YES or NO. If you don't know the answer to a question, put a check under DON'T KNOW.

SECTION I

Yes	No	Don't Know		
( )	( )	( )	1.	Does diabetes affect the way the body uses sugar?
( )	( )	( )	2.	Can people with diabetes eat what they want whenever they want as long as they limit their calories?
( )	( )	( )	3.	Is urine testing of sugar levels more accurate than blood testing?
( )	( )	( )	4.	Should friends of people with diabetes be taught to treat low blood sugar?
( )	( )	( )	5.	Should people with diabetes who are sick check their urine for ketones?
( )	( )	( )	6.	Can blurred vision be a sign of both high and low blood sugar?
( )	( )	( )	7.	Does eating more than usual cause low blood sugar?
( )	( )	( )	8.	Is drinking juice a quick treatment for low blood sugar?
( )	( )	( )	9.	Does a person with high blood sugar usually feel hungry and sweaty?
( )	( )	( )	10.	Does having an infection lower blood sugar levels?
( )	( )	( )	11.	Do foods that are grouped together on the diabetic exchange list have about the same amount of calories?

Yes	No	Don't Know	
( )	( )	( )	12. Should people with diabetes try to vary the amount of food they eat each day?
( )	( )	( )	13. Should people with diabetes begin their exercise programs gradually?
( )	( )	( )	14. Will playing a hard game of tennis usually raise blood sugar levels?
( )	( )	( )	15. Do people with diabetes only need to write down the results of sugar level testing if they are sick?

SECTION II

If you take insulin, complete Section II. If you take pills for your diabetes, go to Section III. If you do not take insulin or diabetes pills, stop here.

Yes	No	Don't Know	
( )	( )	( )	1. Should insulin injections be given at about the same time each day?
( )	( )	( )	2. Is high blood sugar caused by taking too much insulin?
( )	( )	( )	3. Should people with diabetes always carry some form of sugar?

SECTION III

If you take pills for your diabetes, complete Section III.

Yes	No	Don't Know	
( )	( )	( )	1. Is taking diabetes pills the only treatment needed to control diabetes?
( )	( )	( )	2. Do diabetes pills increase blood sugar levels?
( )	( )	( )	3. Can weight loss help blood sugar levels return toward normal in people with diabetes?

DIABETES AND ITS MANAGEMENT

Form B

This test is about diabetes and its management. Put a check to show whether you think the answer to each question is YES or NO. If you don't know the answer to a question, put a check under DON'T KNOW.

SECTION I

Yes	No	Don't Know		
( )	( )	( )	1.	Does diabetes develop when the body produces too much insulin?
( )	( )	( )	2.	Do the results of sugar level testing indicate how well diabetes is being controlled?
( )	( )	( )	3.	Is it necessary to double-check the results of blood sugar level tests with urine sugar level tests?
( )	( )	( )	4.	When they are sick, should people with diabetes test their sugar levels more often than they usually do?
( )	( )	( )	5.	Should people with diabetes wear their medical identification all of the time?
( )	( )	( )	6.	Does a person with low blood sugar usually feel thirsty and nauseated?
( )	( )	( )	7.	Is eating a high-fat food the best treatment for low blood sugar?
( )	( )	( )	8.	Can a person with diabetes have high blood sugar and still feel fine?
( )	( )	( )	9.	Does feeling upset or nervous increase blood sugar levels?
( )	( )	( )	10.	Is it best for people with diabetes to eat most of their food late in the day?

Yes	No	Don't Know		
( )	( )	( )	11.	Does exercise usually increase blood sugar levels?
( )	( )	( )	12.	Is the diet recommended for people with diabetes healthy for almost anyone?
( )	( )	( )	13.	Does eating a lot of sugar cause diabetes?
( )	( )	( )	14.	Can regular exercise improve the condition of the heart?
( )	( )	( )	15.	Should people with diabetes try to eat their meals at about the same time each day?

SECTION II

If you take insulin, complete Section II. If you take pills for your diabetes, go to Section III. If you do not take insulin or diabetes pills, stop here.

Yes	No	Don't Know		
( )	( )	( )	1.	Should insulin be injected directly into the bloodstream?
( )	( )	( )	2.	Can low blood sugar be caused by taking too much insulin?
( )	( )	( )	3.	To avoid spreading disease, should insulin syringes only be used by one person?

SECTION III

If you take pills for your diabetes, complete Section III.

Yes	No	Don't Know		
( )	( )	( )	1.	Are diabetes pills a type of insulin?
( )	( )	( )	2.	Should diabetes be controlled with diabetes pills alone?
( )	( )	( )	3.	Can diabetes pills react with alcohol?

DIABETES

(FORMS A & B)

This knowledge measure examines what participants know about diabetes and the manage nent of diabetes. This measure is appropriate for preadolescents and parents of preadolescents and young children.

PURPOSE

Information regarding participants' knowledge of diabetes and its management may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants do not know about certain aspects of diabetes management. Decisions about how to allocate instructional time can then be made based on this information.
- When the measure is administered prior to and following a program, it is possible to evaluate changes in participants' knowledge.

PROCEDURES

Because the equidifficulty of the forms has not been established, it is best not to give all participants Form A as a pretest and Form B as a posttest. Instead, choose either of the following methods.

- Review Forms A and B and select one. Give all participants the selected form both before and after the program. Alternatively, select 15 items from the two forms and construct a measure most consistent with program emphases. Then administer the "new" form both before and after the program.
- Give Form A to half of the incoming participants and Form B to the remaining half. To distribute the forms randomly, order them "ABABAB" and hand them out. Following the program, give each participant the form not previously taken. For example, if a participant was given Form B before the program, then that participant should be given Form A following the program. This approach eliminates the possibility that examinees will be sensitized to the specific facts to be learned in the program.

SCORING AND ANALYSIS

The answer keys for the two forms are provided below:

Item No.	Form A	Form B
1	No	No
2	Yes	Yes
3	No	Yes
4	No	No
5	Yes	No
6	No	Yes
7	No	Yes
8	Yes	No
9	Yes	No
10	No	Yes
11	Yes	No
12	Yes	Yes
13	No	No
14	Yes	No
15	No	Yes

The measures should be scored by counting the number of correct answers for each participant. Items marked "Don't Know" or left blank should be scored as incorrect. Count the number of correct answers for each participant. Next, total the correct answers for the group and divide by the number of participants in the group. The mean number of correct answers and the standard deviation can be used to summarize participant performance on the measure. Means and standard deviations from before and after the program can be compared to determine changes in participants' knowledge.

DIABETES

Form A

This test contains 15 questions about children with diabetes. Put a check to show whether you think the answer to each question is YES or NO. If you don't know the answer to a question, put a check under DON'T KNOW.

Yes	No	Don't Know	
( )	( )	( )	1. Does diabetes develop when the body makes too much insulin?
( )	( )	( )	2. Can different types of insulin be used together to control blood sugar levels?
( )	( )	( )	3. Should children with diabetes try to change the amount of food they eat each day?
( )	( )	( )	4. Do urine tests and blood tests always give the same information about blood sugar levels?
( )	( )	( )	5. Can children with diabetes get low blood sugar by playing harder than usual?
( )	( )	( )	6. Should insulin shots always be given in the same place?
( )	( )	( )	7. Does diabetes usually go away after a few years?
( )	( )	( )	8. Do the results of sugar level tests need to be written down?
( )	( )	( )	9. Does testing sugar levels show how well diabetes is being controlled?
( )	( )	( )	10. Does taking too much insulin cause high blood sugar?
( )	( )	( )	11. Should insulin shots be given at about the same time each day?
( )	( )	( )	12. Should children with diabetes wear medical I.D. all of the time?

Yes	No	Don't Know	
( )	( )	( )	13. Should children with diabetes try to eat most of their food late in the day?
( )	( )	( )	14. Can skipping a meal cause low blood sugar?
( )	( )	( )	15. Should blood sugar level testing only be done in a doctor's office?

DIABETES

Form B

This test contains 15 questions about children with diabetes. Put a check to show whether you think the answer to each question is YES or NO. If you don't know the answer to a question, put a check under DON'T KNOW.

Yes	No	Don't Know	
( )	( )	( )	1. Does eating a lot of sugar cause diabetes?
( )	( )	( )	2. Should children with diabetes always carry some form of sugar?
( )	( )	( )	3. Can children with diabetes get low blood sugar by skipping meals?
( )	( )	( )	4. Do all types of insulin work the same?
( )	( )	( )	5. Should insulin shots be put into the bloodstream?
( )	( )	( )	6. Does insulin allow sugar to enter the body's cells?
( )	( )	( )	7. Should children with diabetes eat their meals at about the same time each day?
( )	( )	( )	8. Is it best to only give insulin shots in the arms?
( )	( )	( )	9. Should children with diabetes avoid running sports like soccer and basketball?
( )	( )	( )	10. Can high blood sugar develop when there is not enough insulin in the blood?
( )	( )	( )	11. Do children with diabetes who are feeling well only need to test their sugar levels once a day?
( )	( )	( )	12. Can a child have a negative urine sugar test and still have high blood sugar?
( )	( )	( )	13. Should children with diabetes avoid eating snacks between meals?

Yes	No	Don't Know		
( )	( )	( )	14.	Should testing for ketones in the urine only be done in the doctor's office?
( )	( )	( )	15.	Does exercise usually lower blood sugar levels?

THE COMPLICATIONS OF DIABETES
(FORMS A & B)

This knowledge measure examines what participants know about the prevention and treatment of the complications of diabetes. This measure is appropriate for adults, adolescents, and parents of preadolescents and young children.

PURPOSE

Information regarding participants' knowledge about the prevention and treatment of diabetic complications may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants do not know about the prevention and treatment of certain diabetic complications. Decisions about how to allocate instructional time can then be made based on this information.
- When the measure is administered prior to and following a program, it is possible to evaluate changes in participants' knowledge.

PROCEDURES

Because the equidifficulty of the forms has not been established, it is best not to give all participants Form A as a pretest and Form B as a posttest. Instead, choose either of the following methods.

- Review Forms A and B and select one. Give all participants the selected form both before and after the program. Alternatively, select 20 items from the two forms and construct a measure most consistent with program emphases. Then administer the "new" form both before and after the program.
- Give Form A to half of the incoming participants and Form B to the remaining half. To distribute the forms randomly, order them "ABABAB" and hand them out. Following the program, give each participant the form not previously taken. For example, if a participant was given Form B before the program, then that participant should be given Form A following the program. This approach eliminates the possibility that examinees will be sensitized to the specific facts to be learned in the program.

SCORING AND ANALYSIS

The answer keys for the two forms are provided below:

Item No.	Form A	Form B
1	Yes	Yes
2	No	No
3	No	Yes
4	Yes	No
5	No	Yes
6	No	No
7	No	Yes
8	No	Yes
9	Yes	Yes
10	No	No
11	No	Yes
12	Yes	Yes
13	Yes	No
14	No	No
15	Yes	Yes
16	Yes	No
17	No	No
18	Yes	No
19	Yes	Yes
20	Yes	No

The measures should be scored by counting the number of correct answers for each participant. Items marked "Don't Know" or left blank should be scored as incorrect. Count the number of correct answers for each participant. Next, total the correct answers for the group and divide by the number of participants in the group. The mean number of correct answers and the standard deviation can be used to summarize participant performance on the measure. Means and standard deviations from before and after the program can be compared to determine changes in participants' knowledge.

THE COMPLICATIONS OF DIABETES

Form A

This test consists of 20 questions about the complications of diabetes. Put a check to show whether you think the answer to each question is YES or NO. If you don't know the answer to a question, put a check under DON'T KNOW.

Yes	No	Don't Know	
( )	( )	( )	1. Can near-normal blood sugar levels reduce the chance of developing some complications of diabetes?
( )	( )	( )	2. Does diabetes usually damage the lungs?
( )	( )	( )	3. Do only serious visual changes need to be reported to a doctor?
( )	( )	( )	4. Is diabetes a major cause of blindness?
( )	( )	( )	5. Should people with diabetes have their eyes checked by an ophthalmologist once every two to three years?
( )	( )	( )	6. Should toenails be cut to curve with the shape of the toe?
( )	( )	( )	7. Is it only necessary to check the feet if they feel stiff or painful?
( )	( )	( )	8. Does soaking the feet in hot water every day help prevent foot problems?
( )	( )	( )	9. Is high blood pressure related to kidney problems in people with diabetes?
( )	( )	( )	10. Can people with diabetes check for kidney damage by testing their urine ketone levels?
( )	( )	( )	11. Is it only necessary to call a doctor if painful urination lasts for several days?
( )	( )	( )	12. Can diabetic coma be prevented?

Yes	No	Don't Know		
( )	( )	( )	13.	Can high blood sugar that lasts for several days lead to a diabetic coma?
( )	( )	( )	14.	Does being under stress usually lower blood sugar levels?
( )	( )	( )	15.	Should most people with diabetes call their doctor if they are too sick to eat?
( )	( )	( )	16.	Is a person with diabetes more likely to have a heart attack than a person without diabetes?
( )	( )	( )	17.	Can people with diabetes feel the signs of high blood pressure before it is serious?
( )	( )	( )	18.	Can the nerves that affect sexual function become damaged in people with diabetes?
( )	( )	( )	19.	Can tingling in the fingers and toes be a sign of nerve disorder?
( )	( )	( )	20.	Can a skin irritation such as a blister or cut become a serious problem for a person with diabetes?

THE COMPLICATIONS OF DIABETES

Form B

This test consists of 20 questions about the complications of diabetes. Put a check to show whether you think the answer to each question is YES or NO. If you don't know the answer to a question, put a check under DON'T KNOW.

Yes	No	Don't Know		
( )	( )	( )	1.	Are the complications of diabetes related to blood sugar control?
( )	( )	( )	2.	Is cancer a complication of diabetes?
( )	( )	( )	3.	Can diabetes lead to several different kinds of eye disease?
( )	( )	( )	4.	Do people with diabetes only need to visit their ophthalmologist if they are having problems with their vision?
( )	( )	( )	5.	Can blurred vision be a sign of changes in blood sugar level?
( )	( )	( )	6.	Should people with diabetes use chemical preparations to remove corns and calluses?
( )	( )	( )	7.	Can people with diabetes injure their feet and not know it?
( )	( )	( )	8.	Is checking the feet once a day for signs of irritation an effective way to prevent foot problems?
( )	( )	( )	9.	Can people with diabetes reduce the chances of kidney problems by keeping blood sugar at near-normal levels?
( )	( )	( )	10.	Do people usually feel the signs of kidney disease before it gets serious?
( )	( )	( )	11.	Can urinary tract infections cause kidney damage in people with diabetes?

Yes	No	Don't Know		
( )	( )	( )	12.	Is a person with diabetes more likely to develop a diabetic coma when sick with another illness?
( )	( )	( )	13.	Should people with diabetes stop taking their diabetes medication (insulin or diabetes pills) when they are too sick to eat?
( )	( )	( )	14.	Does being under stress or strain lower blood sugar levels?
( )	( )	( )	15.	Can early treatment of high blood sugar levels prevent diabetic coma?
( )	( )	( )	16.	Will eating more fats and oils help prevent heart disease?
( )	( )	( )	17.	Are the signs of high blood pressure obvious?
( )	( )	( )	18.	Are most treatments for high blood pressure ineffective?
( )	( )	( )	19.	Is it necessary for people with diabetes to report any tingling or numbness they feel to their doctor?
( )	( )	( )	20.	Are nerve disorders the least common complication of diabetes?

THE PROBLEMS OF DIABETES
(FORMS A & B)

This knowledge measure examines what participants know about the prevention and treatment of the complications of diabetes. This measure is appropriate for preadolescents.

PURPOSE

Information regarding participants' knowledge about the prevention and treatment of diabetic complications may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants do not know about the prevention and treatment of certain diabetic complications. Decisions about how to allocate instructional time can then be made based on this information.
- When the measure is administered prior to and following a program, it is possible to evaluate changes in participants' knowledge.

PROCEDURES

Because the equidifficulty of the forms has not been established, it is best not to give all participants Form A as a pretest and Form B as a posttest. Instead, choose either of the following methods.

- Review Forms A and B and select one. Give all participants the selected form both before and after the program. Alternatively, select 10 items from the two forms and construct a measure most consistent with program emphases. Then administer the "new" form both before and after the program.
- Give Form A to half of the incoming participants and Form B to the remaining half. To distribute the forms randomly, order them "ABABAB" and hand them out. Following the program, give each participant the form not previously taken. For example, if a participant was given Form B before the program, then that participant should be given Form A following the program. This approach eliminates the possibility that examinees will be sensitized to the specific facts to be learned in the program.

SCORING AND ANALYSIS

The answer keys for the two forms are provided below:

Item No.	Form A	Form B
1	Yes	Yes
2	No	Yes
3	No	No
4	Yes	No
5	No	No
6	No	Yes
7	Yes	No
8	No	Yes
9	Yes	Yes
10	Yes	No

The measures should be scored by counting the number of correct answers for each participant. Items marked "Don't Know" or left blank should be scored as incorrect. Count the number of correct answers for each participant. Next, total the correct answers for the group and divide by the number of participants in the group. The mean number of correct answers and the standard deviation can be used to summarize participant performance on the measure. Means and standard deviations from before and after the program can be compared to determine changes in participants' knowledge.

THE PROBLEMS OF DIABETES

Form A

This test contains 10 questions about the problems that can be caused by diabetes. Put a check to show whether you think the answer to each question is YES or NO. If you don't know the answer to a question, put a check under DON'T KNOW.

Yes	No	Don't Know	
( )	( )	( )	1. Can good control of blood sugar levels help prevent problems caused by diabetes?
( )	( )	( )	2. Does a child with high blood sugar usually feel hungry and weak?
( )	( )	( )	3. Should children with diabetes stop taking their insulin when they are too sick to eat?
( )	( )	( )	4. Do cuts and bruises take longer to heal in people with diabetes?
( )	( )	( )	5. Is it important to wait a few hours before treating low blood sugar?
( )	( )	( )	6. Does having the flu usually lower blood sugar levels?
( )	( )	( )	7. Can blurred vision be a sign of changes in blood sugar level?
( )	( )	( )	8. Is being very thirsty a sign of low blood sugar?
( )	( )	( )	9. Will taking extra insulin lower blood sugar levels?
( )	( )	( )	10. Should children with diabetes drink juice if they feel very shaky and sweaty?

THE PROBLEMS OF DIABETES

Form B

This test contains 10 questions about the problems that can be caused by diabetes. Put a check to show whether you think the answer to each question is YES or NO. If you don't know the answer to a question, put a check under DON'T KNOW.

Yes	No	Don't Know		
( )	( )	( )	1.	Can good control of blood sugar levels now help prevent problems when you are older?
( )	( )	( )	2.	Do children with diabetes need to have their eyes checked if they aren't having any eye problems?
( )	( )	( )	3	Will eating extra food help lower blood sugar levels?
( )	( )	( )	4.	Does urine ketone testing only need to be done when a child with diabetes is sick?
( )	( )	( )	5.	Does being upset usually lower blood sugar levels?
( )	( )	( )	6.	Should children with diabetes test their blood sugar level if they start to feel shaky and weak?
( )	( )	( )	7.	Should children with diabetes stop taking their insulin when they are sick?
( )	( )	( )	8.	Can a child have high blood sugar and still feel fine?
( )	( )	( )	9.	Can high blood sugar lead to a diabetic coma?
( )	( )	( )	10.	Does a child with low blood sugar usually feel thirsty and go to the bathroom a lot?

PREGNANCY AND DIABETES
(FORMS A & B)

This knowledge measure examines what participants know about pregnancy as it relates to diabetes. This measure is appropriate for women and adolescent girls.

PURPOSE

Information regarding participants' knowledge of pregnancy and diabetes may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants do not know about pregnancy and diabetes. Decisions about how to allocate instructional time can then be made based on this information.
- When the measure is administered prior to and following a program, it is possible to evaluate changes in participants' knowledge.

PROCEDURES

Because the equidifficulty of the forms has not been established, it is best not to give all participants Form A as a pretest and Form B as a posttest. Instead, choose either of the following methods.

- Review Forms A and B and select one. Give all participants the selected form both before and after the program. Alternatively, select 10 items from the two forms and construct a measure most consistent with program emphases. Then administer the "new" form both before and after the program.
- Give Form A to half of the incoming participants and Form B to the remaining half. To distribute the forms randomly, order them "ABABAB" and hand them out. Following the program, give each participant the form not previously taken. For example, if a participant was given Form B before the program, then that participant should be given Form A following the program. This approach eliminates the possibility that examinees will be sensitized to the specific facts to be learned in the program.

SCORING AND ANALYSIS

The correct answer keys for the two forms are provided below:

Item No.	Form A	Form B
1	Yes	No
2	No	Yes
3	Yes	No
4	No	No
5	Yes	Yes
6	No	Yes
7	No	No
8	Yes	Yes
9	No	No
10	Yes	Yes

The measures should be scored by counting the number of correct answers for each participant. Items marked "Don't Know" or left blank should be scored as incorrect. Count the number of correct answers for each participant. Next, total the correct answers for the group and divide by the number of participants in the group. The mean number of correct answers and the standard deviation can be used to summarize participant performance on the measure. Means and standard deviations from before and after the program can be compared to determine changes in participants' knowledge.

PREGNANCY AND DIABETES

Form A

This test consists of 10 questions about pregnancy and diabetes. Put a check to show whether you think the answer to each question is YES or NO. If you don't know the answer to a question, put a check under DON'T KNOW.

Yes	No	Don't Know	
( )	( )	( )	1. Does a woman's management of her diabetes before she becomes pregnant have any effect on the success of her pregnancy?
( )	( )	( )	2. Should a woman with diabetes stay with one blood sugar testing schedule throughout her pregnancy?
( )	( )	( )	3. If they occur, do most diabetes-related birth defects develop early in the pregnancy?
( )	( )	( )	4. If one parent of a child has type II diabetes, does the child have a 50% chance of developing the disease as an adult?
( )	( )	( )	5. Does diabetic coma develop more quickly when a woman with diabetes is pregnant than when she is not pregnant?
( )	( )	( )	6. Should pregnant women with diabetes avoid eating between-meal snacks?
( )	( )	( )	7. Does the body usually need less insulin during the second half of pregnancy?
( )	( )	( )	8. Can pre-existing complications of diabetes, such as eye problems, become worse during pregnancy?
( )	( )	( )	9. Must women with diabetes have Caesarean (surgical) deliveries?
( )	( )	( )	10. Can gestational diabetes (diabetes that develops during pregnancy) have an effect on the size of the baby at birth?

PREGNANCY AND DIABETES

Form B

This test consists of 10 questions about pregnancy and diabetes. Put a check to show whether you think the answer to each question is YES or NO. If you don't know the answer to a question, put a check under DON'T KNOW.

Yes	No	Don't Know	
( )	( )	( )	1. Is it healthy for a woman with diabetes to be in the early stage of pregnancy and not know it?
( )	( )	( )	2. Is high blood pressure a serious problem for pregnant women with diabetes?
( )	( )	( )	3. Will a woman with diabetes reduce the chances of diabetes-related birth defects by having children before she's 30 years old?
( )	( )	( )	4. If one parent of a child has type I diabetes, does the child have a 50% chance of developing the disease?
( )	( )	( )	5. Do women with diabetes often require more hospitalization during pregnancy than other women?
( )	( )	( )	6. Should women with diabetes try to breast-feed their babies?
( )	( )	( )	7. Is it normal for a woman with diabetes to lose a few pounds when she first becomes pregnant?
( )	( )	( )	8. Will women who ordinarily take diabetes pills probably need to inject insulin while they are pregnant?
( )	( )	( )	9. Should pregnant women with diabetes test their urine instead of their blood for sugar?
( )	( )	( )	10. Do women who develop diabetes during pregnancy (gestational diabetes) often develop another type of diabetes later?

MANAGEMENT OF DIABETES AND ITS COMPLICATIONS
(FORMS A & B)

This skill measure assesses participants' ability to select appropriate courses of action for managing diabetes and its complications. This measure is comprised of three sections. Section I should be completed by all respondents; Section II is appropriate only for those respondents who take insulin; Section III should be completed only by those respondents who take pills for their diabetes. **Management of Diabetes and Its Complications** is appropriate for adults and adolescents.

PURPOSE

Information regarding participants' ability to select appropriate courses of action for managing diabetes and diabetic complications may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants cannot select appropriate ways to manage diabetes. Decisions about how to allocate instructional time can then be made based on this information.
- When the measure is administered prior to and following a program, it is possible to evaluate changes in participants' skills.

PROCEDURES

Because the equidifficulty of the forms has not been established, it is best not to give all participants Form A as a pretest and Form B as a posttest. Instead, choose either of the following methods.

- Review Forms A and B and select one. Give all participants the selected form both before and after the program. Alternatively, select individual items or entire sections on the two forms and construct a measure most consistent with program emphases. For example, if all program participants need to take insulin and not diabetes pills, as in an adolescent program, Section III of the measure need not be given. Administer the "new" form both before and after the program.
- Give Form A to half of the incoming participants and Form B to the remaining half. To distribute the forms randomly, order them "ABABAB" and hand them out. Following the program, give each participant the form not previously taken. For example, if a participant was given Form B before the program, then that participant should be given Form A following the program. This approach eliminates the possibility that examinees will remember how they answered each item from the pretest.

SCORING AND ANALYSIS

The answer keys for the two forms are provided below:

Item No.	Form A	Form B
	Section I	
1	C	C
2	A	C
3	B	A
4	C	B
5	A	A
6	B	B
	Section II	
1	B	A
2	C	C
3	B	A
4	A	C
5	A	B
6	C	B
	Section III	
1	B	B
2	B	A
3	A	A
4	C	C
5	C	C
6	A	B

The measures should be scored *by section.* For each participant, count the number of correct answers in each completed section. Items that should have been answered but were left blank or marked "Don't Know" should be scored as incorrect. For each section, count the number of correct answers for each participant. Next, total the correct answers for the group and divide by the number of participants in the group. The mean number of correct answers and the standard deviation can be used to summarize participant performance for each section. Means and standard deviations from before and after the program can be compared to determine changes in participants' skills.

MANAGEMENT OF DIABETES AND ITS COMPLICATIONS

Form A

This test presents descriptions of people with diabetes. They have each been given a diabetes management plan to help them control their diabetes. Read each description. Then circle the letter of the appropriate action for the person to take. If you don't know the appropriate action for the person to take, circle the letter D for DON'T KNOW.

SECTION I

1. Caroline wants to test her sugar levels properly. What is an appropriate action for Caroline to take?

   A. Double-check her blood test results with urine sugar level tests.

   B. Ensure accuracy by only testing her sugar levels at the doctor's office.

   C. Write down the results of her sugar level tests.

   D. Don't know

2. Carl wants to eat healthfully. He knows that his meal plan is an important part of his diabetes management program. What is an appropriate action for Carl to take?

   A. Eat meals in which about half of his calories come from carbohydrates.

   B. Eat meals in which about half of his calories come from plant fats.

   C. Eat meals in which about half of his calories come from proteins.

   D. Don't know

3. Leonard wants to take good care of his eyes because he knows that people with diabetes sometimes have eye problems. What is an appropriate action for Leonard to take?

   A. Have his eyes checked once every two years.

   B. Have his eyes checked at least once every year.

   C. Report vision problems to his doctor only if they last for several days.

   D. Don't know

4. Elizabeth wants to eat well because she knows that it's important for good diabetes control. What is an appropriate action for Elizabeth to take?

   A. Avoid eating foods that are high in complex carbohydrates.

   B. Make sure that all of the packaged foods she eats are labeled "dietetic."

   C. Schedule meals so that her calories are spread evenly throughout the day.

   D. Don't know

5. Gary knows that people with diabetes are more likely to have foot problems. He wants to take good care of his feet. What is an appropriate action for Gary to take?

   A. Check his feet every day for signs of problems.

   B. Keep his toenails short and curved around the toe.

   C. Carefully remove corns and calluses using over-the-counter preparations.

   D. Don't know

6. Ruth is beginning an exercise program as part of her diabetes management plan. What is an appropriate action for Ruth to take?

   A. Try to push herself so she will get in shape quickly.

   B. Start the program at a comfortable level.

   C. Be sure she consistently exercises for at least one hour each day.

   D. Don't know

SECTION II

This section presents descriptions of people with diabetes who take insulin. If you take insulin, complete Section II. If you take pills for your diabetes, complete Section III. If you do not take insulin or diabetes pills, stop here.

1. Maria takes two shots of insulin a day, one before breakfast and one before dinner. Each shot is a mixture of short-acting (regular) insulin and intermediate-acting (NPH) insulin. For several days she has been feeling weak and shaky before dinner, even though she eats a good lunch. What is an appropriate action for Maria to take?

   A. Reduce the amount of short-acting insulin she takes in her evening shot.

   B. Reduce the amount of intermediate-acting insulin she takes in her morning shot.

   C. Reduce the amount of short-acting insulin she takes in her morning shot.

   D. Don't know

2. Bob woke up this morning with a stomach flu and feels too sick to eat anything. He has called and left a message for his doctor to call him back. What is an appropriate action for Bob to take?

   A. Avoid taking any insulin until he talks to his doctor.

   B. Stop taking insulin until he is able to eat.

   C. Continue taking insulin while he waits for the doctor to call.

   D. Don't know

3. For the past several days, Peter has had high blood sugar levels before dinner. Peter takes one morning shot that is a mixture of short-acting and intermediate-acting insulin. What is an appropriate action for Peter to take?

   A. Reduce the amount of short-acting insulin he takes.

   B. Increase the amount of intermediate-acting insulin he takes.

   C. Increase the amount of short-acting insulin he takes.

   D. Don't know

4. This morning Jill took a long walk after breakfast. Now she feels confused and weak. What is an appropriate action for Jill to take.

   A. Drink a glass of juice.

   B. Plan on eating a larger lunch than usual.

   C. Plan on taking extra insulin in her next shot.

   D. Don't know

5. Frank completes the following chart of his insulin injections and blood sugar levels:

	Insulin		**Blood Sugar Tests**			
	8 am					
Date	**Short Acting**	**Intermediate Acting**	**Before Breakfast (8 am)**	**Before Lunch (noon)**	**Before Dinner (5 pm)**	**Before Bed (10 pm)**
Oct. 6	20	7	91	180	116	118
Oct. 7	20	7	102	175	111	103
Oct. 8	20	7	93	191	96	98
Oct. 9						

Frank wants to keep his blood sugar levels between 80 and 120. He is now preparing his morning injection for October 9. What is an appropriate action for Frank to take?

   A. Increase the amount of short-acting insulin he takes.

   B. Increase the amount of intermediate-acting insulin he takes.

   C. Reduce the amount of short-acting insulin he takes.

   D. Don't know

6. Marion wants to go to a folk dancing class. Before leaving for the class, Marion tests her blood and finds that her sugar level is slightly high. What is an appropriate action for Marion to take?

   A. Eat a sandwich before the class.

   B. Stay home and plan to go to the class next week.

   C. Bring a snack with her to the class.

   D. Don't know

SECTION III

This section presents descriptions of people with diabetes who take diabetes pills. If you take pills for your diabetes, complete Section III.

1. Harold has had high blood sugar for several days, but doesn't have any ketones in his urine. What is an appropriate action for Harold to take?

   A. Call his doctor only if he develops ketones in his urine.

   B. Call his doctor right away.

   C. Eat more foods that are high in complex carbohydrates.

   D. Don't know

2. To help control his diabetes, Juan needs to lose some weight. What is an appropriate action for Juan to take?

   A. Eat whatever he wants, but limit his calories.

   B. Follow a balanced diet, but eat smaller portions than he does now.

   C. Avoid eating starchy foods like bread and potatoes.

   D. Don't know

3. This afternoon Anne didn't eat lunch and played tennis instead. Now she feels shaky and weak. What is an appropriate action for Anne to take?

   A. Test her blood sugar level.

   B. Lie down for awhile and then drink some juice.

   C. Drink a diet soda that contains caffeine.

   D. Don't know

4. Suzanne knows that high blood pressure can be a serious problem for people with diabetes. Suzanne wants to do what she can to prevent high blood pressure. What is an appropriate action for Suzanne to take?

   A. Follow a meal plan that reduces the amount of carbohydrates she eats.

   B. Follow a meal plan that increases the amount of fiber she eats.

   C. Follow a meal plan that reduces the amount of salt she eats.

   D. Don't know

5. Today Yvonne skipped lunch because she is eating dinner out at a restaurant. As she waits for the waiter to take her order, Yvonne starts to feel weak and slightly confused. What is an appropriate action for Yvonne to take?

   A. Ask that her salad be served right away.

   B. Order an alcoholic beverage.

   C. Ask the waiter to bring her some juice.

   D. Don't know

6. Today John is sick with the flu. What is an appropriate action for John to take?

   A. Test his blood sugar levels and urine ketones frequently.

   B. Stop taking his diabetes pills until he is well again.

   C. Eat and drink less so he won't get an upset stomach.

   D. Don't know

MANAGEMENT OF DIABETES AND ITS COMPLICATIONS

Form B

This test presents descriptions of people with diabetes. They have each been given a diabetes management plan to help them control their diabetes. Read each description. Then circle the letter of the appropriate action for the person to take. If you don't know the appropriate action for the person to take, circle the letter D for DON'T KNOW.

SECTION I

1. Pat wants to test her sugar levels correctly. What is an appropriate action for Pat to take?

   A. Test her sugar level immediately after every meal.

   B. Double-check her blood test results with urine sugar level tests.

   C. Keep and use a record of her sugar level test results.

   D. Don't know

2. Lee knows that his meal plan is an important part of his diabetes management program. What is an appropriate action for Lee to take?

   A. Avoid eating foods that are high in complex carbohydrates.

   B. Make sure that all of the packaged foods he eats are labeled "dietetic."

   C. Avoid eating foods that are high in sugar.

   D. Don't know

3. Vicky is trying to prevent vision problems when she's older by taking good care of her eyes now. What is an appropriate action for Vicky to take?

   A. Keep her blood pressure in the normal range.

   B. Make sure her doctor checks her eyes once every two years.

   C. Have an ophthalmologist check her eyes once every five years.

   D. Don't know

4. Joe usually gets hungry and wants a snack in the evening. What is an appropriate action for Joe to take?

   A. Eat an evening snack that is high in protein.

   B. Plan an evening snack into his daily meal plan.

   C. Eat what he wants for a snack, but have a small breakfast the next morning.

   D. Don't know

5. Don knows that people with diabetes sometimes have problems with their feet. He wants to avoid developing problems. What is an appropriate action for Don to take?

   A. Check his feet every day for signs of problems.

   B. Soak his feet in hot water every day.

   C. Protect his feet by avoiding activities such as jogging.

   D. Don't know

6. Vanessa is starting a regular exercise program as part of her diabetes management plan. What is an appropriate action for Vanessa to take?

   A. Exercise more vigorously on days when her blood sugar levels are very high.

   B. Begin the program gradually, at a level that is comfortable for her.

   C. Build up her fitness level quickly by exercising for at least one hour every day.

   D. Don't know

SECTION II

This section presents descriptions of people with diabetes who take insulin. If you take insulin, complete Section II. If you take pills for your diabetes, complete Section III. If you do not take insulin or diabetes pills, stop here.

1. Owen takes one insulin shot in the morning before breakfast and another one in the evening before dinner. Each shot is a mixture of short-acting (regular) insulin and intermediate-acting (NPH) insulin. For several days he has been feeling weak and shaky before lunch, even though he eats a good breakfast. What is an appropriate action for Owen to take?

   A. Reduce the amount of short-acting insulin he takes in his morning shot.

   B. Reduce the amount of intermediate-acting insulin he takes in his morning shot.

   C. Reduce the amount of short-acting insulin he takes in his evening shot.

   D. Don't know

2. Burt has a bad cold and is staying in bed today. What is an appropriate action for Burt to take?

   A. Eat and drink less because he isn't as active as usual.

   B. Stop taking insulin until he is feeling better.

   C. Test his blood sugar levels and urine ketones frequently.

   D. Don't know

3. Melissa is helping a girlfriend move this morning. She knows she will be doing a lot of lifting and walking. Melissa tests her blood and finds her sugar level in the normal range. What is an appropriate action for Melissa to take?

   A. Reduce the amount of insulin in her morning shot.

   B. Eat a smaller lunch than usual today.

   C. Take an extra insulin shot after they're finished.

   D. Don't know

4. Jim was too busy to eat lunch. He now feels light-headed and shaky. What is an appropriate action for Jim to take?

   A. Plan on eating a larger dinner than usual.

   B. Immediately take some extra insulin and lie down.

   C. Drink some juice and then eat a sandwich.

   D. Don't know

5. Dale completes the following chart of her insulin injections and blood sugar levels:

	Insulin		Blood Sugar Tests			
	8 am					
Date	Short Acting	Intermediate Acting	Before Breakfast (8 am)	Before Lunch (noon)	Before Dinner (5 pm)	Before Bed (10 pm)
Dec. 6	18	7	86	111	180	112
Dec. 7	18	7	85	93	172	118
Dec. 8	18	7	90	100	178	113
Dec. 9						

Dale wants to keep her blood sugar levels between 80 and 120. She is now preparing her morning injection for December 9. What is an appropriate action for Dale to take?

   A. Increase the amount of short-acting insulin she takes.

   B. Increase the amount of intermediate-acting insulin she takes.

   C. Reduce the amount of intermediate-acting insulin she takes.

   D. Don't know

6 Helen is going to play in a softball game this afternoon. Before the game, Helen tests her blood and finds that her blood sugar level is slightly low. What is an appropriate action for Helen to take?

A. Eat a snack that is high in fat.

B. Eat a snack that is high in complex carbohydrates.

C. Increase the amount of insulin in her next shot.

D. Don't know

SECTION III

This section presents descriptions of people with diabetes who take diabetes pills. If you take pills for your diabetes, complete Section III.

1. This morning Joanne woke up with a bad cold and doesn't feel like eating. She has left a message for her doctor and is waiting for the doctor to call her back. What is an appropriate action for Joanne to take?

   A. Avoid drinking any liquids until she talks to her doctor.

   B. Test her blood sugar levels and urine ketones frequently.

   C. Rest and take some cold medicine.

   D. Don't know

2. Al is overweight and needs to lose 30 pounds. What is an appropriate action for Al to take?

   A. Follow a meal plan that limits calories.

   B. Take diet pills to help reduce his appetite.

   C. Try to avoid eating carbohydrates like pasta and bread.

   D. Don't know

3. Today Jean skipped lunch and took a brisk walk instead. Now she feels weak and slightly confused. What is an appropriate action for Jean to take?

   A. Test her blood sugar level.

   B. Lie down and take a short nap.

   C. Wait until dinner and then eat an extra piece of fruit.

   D. Don't know

4. For the last few days Phil's blood sugar levels have been high. What is an appropriate action for Phil to take?

   A. Call his doctor only if he develops ketones in his urine.

   B. Reduce the number of diabetes pills he takes.

   C. Call his doctor right away.

   D. Don't know

5. Ken knows that people with diabetes are at a higher risk of developing heart disease. Ken wants to do what he can to prevent heart disease. What is an appropriate action for Ken to take?

   A. Follow a high-protein diet.

   B. Follow a low-fiber diet.

   C. Follow a low-fat diet.

   D. Don't know

6. Lately Regina has had low blood sugar levels, but has not noticed the usual symptoms. What is an appropriate action for Regina to take?

   A. Maintain higher blood sugar levels than usual.

   B. Test her blood sugar levels frequently.

   C. Immediately stop taking her diabetes pills and plan on seeing her doctor soon.

   D. Don't know

TAKING CARE OF DIABETES
(FORMS A & B)

This skill measure assesses participants' ability to select appropriate courses of action for managing diabetes and its complications. This measure is appropriate for preadolescents and parents of preadolescents and young children.

PURPOSE

Information regarding participants' ability to select appropriate courses of action for managing diabetes and diabetic complications may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants cannot select appropriate ways to manage diabetes. Decisions about how to allocate instructional time can then be made based on this information.
- When the measure is administered prior to and following a program, it is possible to evaluate change in participants' skill.

PROCEDURES

Because the equidifficulty of the forms has not been established, it is best not to give all participants Form A as a pretest and Form B as a posttest. Instead, choose either of the following methods.

- Review Forms A and B and select one. Give all participants the selected form both before and after the program. Alternatively, select 10 items from the two forms and construct a measure most consistent with program emphases. Then administer the "new" form both before and after the program.
- Give Form A to half of the incoming participants and Form B to the remaining half. To distribute the forms randomly, order them "ABABAB" and hand them out. Following the program, give each participant the form not previously taken. For example, if a participant was given Form B before the program, then that participant should be given Form A following the program. This approach eliminates the possibility that examinees will remember how they answered each item from the pretest.

SCORING AND ANALYSIS

The answer keys for the two forms are provided below:

Item No.	Form A	Form B
1	A	A
2	B	C
3	B	A
4	C	B
5	A	A
6	C	B
7	C	C
8	A	B
9	B	A
10	A	C

The measures should be scored by counting the number of correct answers for each participant. Items marked "Don't Know" or left blank should be scored as incorrect. Count the number of correct answers for each participant. Next, total the correct answers for the group and divide by the number of participants in the group. The mean number of correct answers and the standard deviation can be used to summarize participant performance on the measure. Means and standard deviations from before and after the program can be compared to determine changes in participants' skills.

TAKING CARE OF DIABETES

Form A

This test is about children with diabetes. Some of the children take care of their diabetes on their own. Others receive help from their parents. Read the situations. Circle the letter that tells what the people should do. If you don't know what the people should do, circle the letter D for DON'T KNOW.

1. This morning Jill played at the park. Now she is back home and feels shaky and weak. What should Jill do?

   A. Test her blood sugar level.

   B. Lie down for awhile and then drink some juice.

   C. Take an extra insulin shot.

   D. Don't know

2. For the past few days, Peter has had high blood sugar levels. What should Peter do?

   A. Take less insulin.

   B. Take more insulin.

   C. Keep his insulin the same and eat more.

   D. Don't know

3. This afternoon Laura played in a basketball game. She had two mild insulin reactions during the game and treated them with sugar. Now Laura is home. What should Laura do?

   A. Take more insulin in her evening shot.

   B. Eat a larger dinner than usual.

   C. Test her urine for ketones.

   D. Don't know

4. Bob woke up with a stomach flu and is too sick to eat. What should Bob and his parents do?

   A. Stop the insulin shots until Bob can eat.

   B. Call the doctor tomorrow if Bob still can't eat.

   C. Call the doctor right away.

   D. Don't know

5. Frank and his mother made the chart below. It helps them keep track of Frank's insulin shots and blood sugar levels.

	Insulin		Blood Sugar Tests			
	8 am					
Date	Short Acting	Intermediate Acting	Before Breakfast (8 am)	Before Lunch (noon)	Before Dinner (5 pm)	Before Bed (9 pm)
Oct. 6	30	7	86	180	111	112
Oct. 7	30	7	85	172	93	118
Oct. 8	30	7				

Frank eats breakfast, lunch, dinner, and a morning and afternoon snack. Frank and his mother are now planning Frank's meals for October 9. They want to keep Frank's blood sugar levels between 80 and 120. What should Frank and his mother do?

   A. Make the morning snack smaller.

   B. Make breakfast larger.

   C. Make the afternoon snack smaller.

   D. Don't know

6. Howard is going to play in a softball game this afternoon. What should Howard do?

   A. Test his urine for ketones before and after the game.

   B. Take an extra insulin shot after the game.

   C. Carry a snack with him to the game.

   D. Don't know

7. Caroline wants to test her blood sugar levels properly. What should Caroline do?
   A. Test her blood right after every meal.
   B. Test her blood once a day, when she gets up in the morning.
   C. Test her blood three to four times a day.
   D. Don't know

8. Lee's parents want to help Lee take good care of his eyes. They know that diabetes can cause eye problems. What should Lee and his parents do?
   A. Try to keep Lee's blood sugar levels as near to normal as possible.
   B. Have Lee's eyes checked once every two years.
   C. Have Lee visit the eye doctor only if Lee has problems with his eyes.
   D. Don't know

9. Carl wants to eat well to help control his diabetes. What should Carl do?
   A. Be sure not to eat snacks, even if he's hungry.
   B. Space his meals and snacks throughout the day.
   C. Eat most of his food at dinner.
   D. Don't know

10. Vanessa has a bad cold and is staying home in bed. What should Vanessa and her parents do?
   A. Test Vanessa's sugar levels and ketones more often than usual.
   B. Stop the insulin shots until Vanessa is feeling better.
   C. Make sure Vanessa eats less because she isn't as active as usual.
   D. Don't know

TAKING CARE OF DIABETES

Form B

This test is about children with diabetes. Some of the children take care of their diabetes on their own. Others receive help from their parents. Read the situations. Circle the letter that tells what the people should do. If you don't know what the people should do, circle the letter D for DON'T KNOW.

1. Jean forgot to eat her morning snack and now she feels confused and shaky. What should Jean do?

   A. Eat one or two pieces of hard candy.

   B. Test for ketones in her urine.

   C. Wait until lunch and then eat an extra piece of fruit.

   D. Don't know

2. For the last three days, Phil's blood sugar levels have been high. He also has had ketones in his urine. What should Phil and his parents do?

   A. Call the doctor in a few days if Phil still has ketones in his urine.

   B. Reduce the amount of insulin in Phil's shots.

   C. Call the doctor right away.

   D. Don't know

3. Rhonda's doctor has just changed her insulin dose. What should Rhonda do?

   A. Test her blood sugar levels more often than usual.

   B. Eat larger meals and snacks.

   C. Take it easy at recess for a few days.

   D. Don't know

4. David enjoys hiking and likes to go on long hikes with his friends. What should David do?

   A. Hike with his friends, but stop and rest often.

   B. Eat snacks and carry some sugar with him on the hikes.

   C. Take extra insulin before the hikes.

   D. Don't know

5. Jim played soccer instead of eating lunch. He now feels shaky and weak. What should Jim do?

   A. Drink some juice and then eat a sandwich.

   B. Take some extra insulin in his next shot.

   C. Lie down and rest quietly.

   D. Don't know

6. John is sick with the flu. What should John and his parents do?

   A. Stop the insulin shots until John is feeling better.

   B. Test John's sugar levels and ketones more often than usual.

   C. Make sure John eats and drinks less because he isn't as active as usual.

   D. Don't know

7. Mark is going to play in a tennis match this morning. He tests his blood and finds his sugar level is in the normal range. What should Mark do?

   A. Eat a smaller lunch than usual after the match.

   B. Avoid getting too tired in the match.

   C. Take less insulin in his morning shot.

   D. Don't know

8. Marie and her parents made the chart below. It helps them keep track of Marie's insulin shots and blood sugar levels.

	Insulin		Blood Sugar Tests			
	8 am					
Date	Short Acting	Intermediate Acting	Before Breakfast (8 am)	Before Lunch (noon)	Before Dinner (5 pm)	Before Bed (9 pm)
Dec. 6	30	7	100	83	205	118
Dec. 7	30	7	93	100	189	110
Dec. 8	30	7	104	95	210	107
Dec. 9						

Marie's blood sugar levels should be between 80 and 120. They are now planning Marie's morning shot for Dec. 9. What should Marie and her parents do?

A. Increase the short-acting insulin.

B. Increase the intermediate-acting insulin.

C. Reduce the short-acting insulin.

D. Don't know

9. Today Melanie's blood sugar levels are higher than usual. What should Melanie do?

A. Test for ketones in her urine.

B. Drink a glass of juice after dinner.

C. Eat a small afternoon snack.

D. Don't know

10. Lucy knows that it's important to eat the right foods. What should Lucy do?

A. Try not to eat foods like potatoes and bread.

B. Try not to eat foods like fish and chicken.

C. Try not to eat foods like pies and cakes.

D. Don't know

DIABETES FAMILY BEHAVIOR CHECKLIST I

This affective measure assesses participants' perceived support from specific family members for performing diabetes-related behaviors. This measure is appropriate for adults with type I diabetes.

PURPOSE

Information about participants' perceived diabetes-related support from specific family members may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants feel the need for more support from their family.
- When this measure is administered prior to and following a program, it is possible to evaluate changes in participants' perceptions of the support they receive from specific family members for the performance of diabetes-related behaviors.

PROCEDURES

This instrument can be administered both at the beginning and at the end of the program. However, handbook users should be alert to concerns regarding the potential reactivity of affective measures. A measure is considered *reactive* if the experience of completing the measure prior to the program causes participants to react differently to the program. Handbook users should, therefore, carefully review each affective measure that they wish to use to determine its potential for making participants unduly sensitive to aspects of the program. If a measure is determined to be reactive, then program personnel should *not* administer that measure to *all* participants as a pretest and posttest. Instead, the measure could be administered to half of the program participants prior to program participation to determine participants' pre-program status. The measure could then be administered to the other half of the participants after program participation to assess participants' post-program status.

SCORING AND ANALYSIS

This measure can be scored in two ways:

- A *positive summary score* can be calculated by adding the frequency ratings of the positive items (items 1, 3, 5, 8, 9, 10, 12, 13, and 15) across participants and dividing this total by the number of participants. Blank items should not be counted in the number of responses. The maximum attainable score of 45 indicates a strong perception of positive interactions with the specific family members rated regarding the performance of diabetes-related behaviors.

DIABETES FAMILY BEHAVIOR CHECKLIST I

Name _____ Date _____

Family Member You Are Rating _____

We want to know how often family members do each of the following things. Just put down what usually happens at home—there are no right or wrong answers. Write down one number from the scale below for each item that best shows how often he/she does what is listed.

1 = never
2 = once a month
3 = once a week
4 = several times a week
5 = at least once a day

How often does he/she:

1. Praise you for following your diet _____
2. Nag you about testing your blood _____
3. Suggest things that might help you take your insulin on time _____
4. Criticize you for not exercising regularly _____
5. Help you decide if changes should be made based on blood testing results _____
6. Nag you about not following your diet _____
7. Argue with you about your diabetes self-care activities _____
8. Encourage you to participate in sports activities _____
9. Plan family activities so that they will fit in with your diabetes self-care schedule _____
10. Congratulate you for sticking to your diabetes self-care schedule _____
11. Criticize you for not recording the results of blood tests _____

DIABETES FAMILY BEHAVIOR CHECKLIST I

Name _____ Date _____

Family Member You Are Rating _____

We want to know how often family members do each of the following things. Just put down what usually happens at home—there are no right or wrong answers. Write down one number from the scale below for each item that best shows how often he/she does what is listed.

1 = never
2 = once a month
3 = once a week
4 = several times a week
5 = at least once a day

How often does he/she:

1. Praise you for following your diet _____
2. Nag you about testing your blood _____
3. Suggest things that might help you take your insulin on time _____
4. Criticize you for not exercising regularly _____
5. Help you decide if changes should be made based on blood testing results _____
6. Nag you about not following your diet _____
7. Argue with you about your diabetes self-care activities _____
8. Encourage you to participate in sports activities _____
9. Plan family activities so that they will fit in with your diabetes self-care schedule _____
10. Congratulate you for sticking to your diabetes self-care schedule _____
11. Criticize you for not recording the results of blood tests _____

How often does he/she:

12. Eat at the same time that you do _____
13. Exercise with you _____
14. Let you sleep late rather than getting up to take your insulin _____
15. Buy you things containing sugar to carry with you in case of an insulin reaction _____
16. Eat foods that are not part of your diabetic diet _____

DIABETES FAMILY BEHAVIOR CHECKLIST II

This affective measure assesses participants' perceived support from specific family members for performing diabetes-related behaviors. This measure is appropriate for adults with type II diabetes.

PURPOSE

Information about participants' perceived diabetes-related support from specific family members may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants feel the need for more support from their family.
- When this measure is administered prior to and following a program, it is possible to evaluate changes in participants' perceptions of the support they receive from specific family members for the performance of diabetes-related behaviors.

PROCEDURES

This instrument can be administered both at the beginning and at the end of the program. However, handbook users should be alert to concerns regarding the potential reactivity of affective measures. A measure is considered *reactive* if the experience of completing the measure prior to the program causes participants to react differently to the program. Handbook users should, therefore, carefully review each affective measure that they wish to use to determine its potential for making participants unduly sensitive to aspects of the program. If a measure is determined to be reactive, then program personnel should *not* administer that measure to *all* participants as a pretest and posttest. Instead, the measure could be administered to half of the program participants prior to program participation to determine participants' pre-program status. The measure could then be administered to the other half of the participants after program participation to assess participants' post-program status.

SCORING AND ANALYSIS

This measure can be scored in several ways:

- A *positive summary score* can be calculated by adding the frequency ratings of the positive items (items 4, 6, 8, 11, 12, 13, 15, 16, and 18) for all participants and dividing this total by the number of participants. Blank items should not be counted in the number of responses. The maximum attainable score of 45 indicates a strong perception of positive interactions with the specific family members rated regarding the performance of diabetes-related behaviors.

EXAMPLE: Imagine that there are 10 program participants. First add up the frequency ratings of the positive items. We will use a total of 360. Divide this total by the number of participants to get a score of 36 across all participants.

- A *negative summary score* and can be calculated by adding the frequency ratings of the negative items (items 5, 7, 9, 10, 14, 17, and 19) for all participants and dividing this total by the number of participants. Blank items should not be counted in the number of responses. The maximum attainable score of 35 indicates a strong perception of negative interactions with the specific family members rated regarding the performance of diabetes-related behaviors.
- *Component scores* can be calculated by adding the frequency ratings of the positive items in the area of interest (diet, exercise, glucose testing or medication) for all participants. Then total and subtract the frequency ratings of the negative items in the area of interest across participants. The maximum attainable score is dependent upon the area of interest, as presented below.

Diabetes Management Component	Maximum Attainable Score
Diet	8
Exercise	9
Glucose Testing	3
Medication	4

A high score indicates a strong perception of positive interactions with the rated family members regarding the performance of the specific diabetes management behavior.

EXAMPLE: Imagine that there are 5 program participants who completed the items on diet (items 4, 9, 15, and 19). First add up the frequency ratings of the positive items (items 4 and 15). We will use a total of 40. Then add up the frequency ratings of the negative items (items 9 and 19) and subtract that total from 40. We will subtract 10 from 40 to get 30. Finally, divide this total by the number of participants to get a score of 6 across all participants.

PSYCHOMETRIC DATA*

Internal Consistency (Cronbach's alpha):

.71 positive summary score
.64 negative summary score

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* For more information regarding predictive validity and other psychometric data for this measure, see Glascow, R. E., & Toobert, D. J. (1988). Social environment and regimen adherence among type II diabetic patients. *Diabetes Care, 11* (5), 377-386.

Reliability (product-moment correlations):

.55 positive summary score
.70 negative summary score

Convergent Validity (product-moment correlations): (*These data represent a comparison between participants' scores and the scores of family members who completed a similar measure.*)

.53 ($p < .001$) positive summary score
.56 ($p < .001$) negative summary score

The component scores of family support were consistently stronger predictors of regimen adherence in that diabetes management area. For example, the items about family support for exercise were more predictive of the individual's adherence to the exercise regimen than either the positive or negative summary scores.

DIABETES FAMILY BEHAVIOR CHECKLIST II

We want to know how often family members do several things related to your daily self-care activities. Rate the family member with whom you generally have the most contact. Just put down what happens at home—there are no right or wrong answers.

1. Family member you are rating (circle one):
   a. Husband c. Partner e. Child
   b. Wife d. Sibling f. Other (specify) _____

2. How much time do you spend with this person on a typical day? (count only waking hours) _____ hours

3. How much does this person know about diabetes? (Please circle a number below)

Hardly Anything			A Moderate Amount			A Great Deal
1	2	3	4	5	6	7

How often does he/she:	Never	Once A Month	Once A Week	Several Times A Week	At Least Once A Day
4. Praise you for following your diet?	1	2	3	4	5
5. Nag you about testing your glucose level?	1	2	3	4	5
6. Suggest things that might help you take your diabetes medication on time?	1	2	3	4	5
7. Criticize you for not exercising regularly?	1	2	3	4	5

	How often does he/she:	Never	Once A Month	Once A Week	Several Times A Week	At Least Once A Day
8.	Help you decide if changes should be made based on glucose testing results?	1	2	3	4	5
9.	Nag you about not following your diet?	1	2	3	4	5
10.	Argue with you about your diabetes self-care activities?	1	2	3	4	5
11.	Encourage you to participate in sports activities?	1	2	3	4	5
12.	Plan family activities so that they will fit in with your diabetes self-care schedule?	1	2	3	4	5
13.	Congratulate you for sticking to your diabetes self-care schedule?	1	2	3	4	5
14.	Criticize you for not recording the results of glucose tests?	1	2	3	4	5
15.	Eat at the same time that you do?	1	2	3	4	5
16.	Exercise with you?	1	2	3	4	5
17.	Let you sleep late rather than getting up to take your diabetes medication?	1	2	3	4	5
18.	Buy you things containing sugar to carry with you in case of a hypoglycemic reaction?	1	2	3	4	5
19.	Eat foods that are not part of your diabetic diet?	1	2	3	4	5
20.	Other supportive or nonsupportive things he/she does:					
	_____	1	2	3	4	5
	_____	1	2	3	4	5
	_____	1	2	3	4	5

YOUR FAMILY AND FRIENDS

This affective measure assesses particip nts' perceived support from family and friends for performing diabetes-specific behaviors. This measure is appropriate for adolescents and preadolescents.

PURPOSE

Information about participants' perceived diabetes-specific support from family and friends may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants feel the need for more support from family and/or friends.
- When this measure is administered prior to and following a program, it is possible to evaluate changes in participants' perceptions of the support they receive for the performance of diabetes-specific behaviors.

PROCEDURES

This instrument can be administered both at the beginning and at the end of the program. However, handbook users should be alert to concerns regarding the potential reactivity of affective measures. A measure is considered *reactive* if the experience of completing the measure prior to the program causes participants to react differently to the program. Handbook users should, therefore, carefully review each affective measure that they wish to use to determine its potential for making participants unduly sensitive to aspects of the program. If a measure is determined to be reactive, then program personnel should *not* administer that measure to *all* participants as a pretest and posttest. Instead, the measure could be administered to half of the program participants prior to program participation to determine participants' pre-program status. The measure could then be administered to the other half of the participants after program participation to assess participants' post-program status.

SCORING AND ANALYSIS

Point values are assigned to responses as follows:

Item No.	Never	Hardly Ever	Some-times	Usually	Always
1	1	2	3	4	5
2	1	2	3	4	5
3	5	4	3	2	1
4	5	4	3	2	1
5	1	2	3	4	5

Item No.	Never	Hardly Ever	Some-times	Usually	Always
6	5	4	3	2	1
7	5	4	3	2	1
8	5	4	3	2	1
9	1	2	3	4	5
10	1	2	3	4	5
11	5	4	3	2	1
12	1	2	3	4	5
13	1	2	3	4	5
14	5	4	3	2	1
15	5	4	3	2	1
16	1	2	3	4	5
17	1	2	3	4	5
18	5	4	3	2	1
19	1	2	3	4	5
20	1	2	3	4	5

This measure can be scored in two ways:

- A *total score* can be calculated by adding the point values of all responses for all participants and dividing this total by the number of responses. Blank items should not be counted in the number of responses. The maximum attainable score of 5 points indicates a high degree of perceived support from family and friends for performing diabetes-specific behaviors. A minimum score of 1 indicates a low degree of perceived support from family and friends.

  EXAMPLE: Imagine that there are 10 program participants. First assign the appropriate points to the marked responses. Add up all the points. We will use a total of 760. Divide this total by the total number of responses from all participants. We will use 190 responses for this example. (The total possible number of responses is 200 if all 10 participants left no items blank.) Divide 760 by 190 to get an average score of 4.0.

- Program personnel may want to calculate *positive* and *negative scores* for all participants. Items 1, 2, 5, 9, 10, 12, 13, 16, 17, 19, and 20 are examples of positive, supportive interactions. A positive score can be calculated by adding the point values of the positive items across participants and dividing this total by the number of positive responses. Blank items should not be counted in the number of responses. The maximum attainable score of 5 points indicates a strong perception of positive interactions with family and friends regarding the performance of diabetes-specific behaviors.

EXAMPLE: Imagine that there are 10 program participants. First assign the appropriate points to the "positive" items. Add up the points. We will use a total of 440. Divide this total by the total number of responses for positive items from all participants. We will use 100 responses for this example. (The total possible number of responses is 110 if all participants left no positive items blank.) Divide 440 by 100 to get an average score of 4.4.

Items 3, 4, 6, 7, 8, 11, 14, 15, and 18 are examples of negative, non-supportive interactions. A negative score can be calculated by adding the point values of the negative items for all participants and dividing this total by the number of negative responses. The maximum attainable score of 1 indicates a strong perception of negative interactions with family and friends regarding the performance of diabetes-specific behaviors.

YOUR FAMILY AND FRIENDS

The questions below ask about different things people may do that are related to your diabetes and its management. Put a check to show how often your friends or family do these things. There are no right or wrong answers.

	Never	Hardly Ever	Some-times	Usually	Always
1. How often do your friends do things to help you when you have an insulin reaction?	( )	( )	( )	( )	( )
2. How often does your family prepare meals that you are able to eat?	( )	( )	( )	( )	( )
3. How often do your friends talk about your diabetes with people you hardly know?	( )	( )	( )	( )	( )
4. How often does your family keep foods in the house that you are not supposed to eat?	( )	( )	( )	( )	( )
5. How often does your family notice when you aren't feeling well and do things to help you feel better?	( )	( )	( )	( )	( )
6. How often do your friends tell you it's all right to eat foods that you know you shouldn't eat?	( )	( )	( )	( )	( )
7. How often does your family nag you about taking your insulin on time?	( )	( )	( )	( )	( )
8. How often do your friends get upset if you have to test your sugar levels when you're out together?	( )	( )	( )	( )	( )
9. How often do your friends encourage you to play sports with them?	( )	( )	( )	( )	( )

	Never	Hardly Ever	Some-times	Usually	Always
10. How often does your family help you plan changes based on your sugar levels?	( )	( )	( )	( )	( )
11. How often does your family nag you about testing your sugar levels?	( )	( )	( )	( )	( )
12. How often do your friends listen to you when you need to talk about your diabetes?	( )	( )	( )	( )	( )
13. How often does your family encourage you to get exercise?	( )	( )	( )	( )	( )
14. How often does your family talk about the amount of money it costs to take care of your diabetes?	( )	( )	( )	( )	( )
15. How often do your friends leave you out of activities because you have diabetes?	( )	( )	( )	( )	( )
16. How often do your friends help you work out problems related to your diabetes?	( )	( )	( )	( )	( )
17. How often does your family encourage you to do things with other people who have diabetes, like join groups or go to summer camp?	( )	( )	( )	( )	( )
18. How often do your friends shy away and let other people help you when you have an insulin reaction?	( )	( )	( )	( )	( )
19. How often do your friends plan activities that fit in with your diabetes schedule?	( )	( )	( )	( )	( )
20. How often does your family eat when you do even if it's not their usual meal time?	( )	( )	( )	( )	( )

FEELINGS ABOUT YOUR DIABETES MANAGEMENT PLAN

This measure assesses participants' belief in the effectiveness of their diabetes management plan. Participants are asked about their beliefs related to glucose and ketone testing, medication (insulin or diabetes pills), diet, and exercise. This measure is appropriate for adults.

PURPOSE

Information about participants' belief in the effectiveness of their diabetes management plan may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate a need to strengthen participants' appreciation for the value of their management plans.
- When this measure is administered prior to and following a program, it is possible to evaluate changes in participants' beliefs about their management plans.

PROCEDURES

This instrument can be administered both at the beginning and at the end of the program. However, handbook users should be alert to concerns regarding the potential reactivity of affective measures. A measure is considered *reactive* if the experience of completing the measure prior to the program causes participants to react differently to the program. Handbook users should, therefore, carefully review each affective measure that they wish to use to determine its potential for making participants unduly sensitive to aspects of the program. If a measure is determined to be reactive, then program personnel should *not* administer that measure to *all* participants as a pretest and posttest. Instead, the measure could be administered to half of the program participants prior to program participation to determine participants' pre-program status. The measure could then be administered to the other half of the participants after program participation to assess participants' post-program status.

SCORING AND ANALYSIS

Point values are assigned to responses as follows:

Item No.	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
1	5	4	3	2	1
2	5	4	3	2	1
3	1	2	3	4	5
4	1	2	3	4	5
5	1	2	3	4	5
6	5	4	3	2	1
7	5	4	3	2	1
8	1	2	3	4	5
9	1	2	3	4	5
10	1	2	3	4	5
11	1	2	3	4	5
12	5	4	3	2	1
13	5	4	3	2	1
14	1	2	3	4	5
15	5	4	3	2	1
16	5	4	3	2	1
17	1	2	3	4	5
18	5	4	3	2	1

This measure can be scored by adding the point values of the responses from all participants and dividing this total by the number of responses. Blank items and items marked "Doesn't Apply" should not be counted in the number of responses. The maximum attainable score of 5 points indicates a strong belief in the effectiveness of the diabetes management plan. A minimum score of 1 indicates weak belief in the effectiveness of the diabetes management plan.

FEELINGS ABOUT YOUR DIABETES MANAGEMENT PLAN

The sentences below describe how you might feel about different parts of your diabetes management plan. Put a check to show how much you agree or disagree with each sentence. If a sentence does not apply to your diabetes management plan, put a check under DOESN'T APPLY.

	Doesn't Apply	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
1. Eating the right foods helps me control my diabetes.	( )	( )	( )	( )	( )	( )
2. Regular exercise helps me feel better.	( )	( )	( )	( )	( )	( )
3. Testing my sugar levels as often as I'm supposed to is more trouble than it's worth.	( )	( )	( )	( )	( )	( )
4. I feel fine whether or not I take my diabetes pills as I'm supposed to.	( )	( )	( )	( )	( )	( )
5. I can control my diabetes even if I only exercise on the weekends.	( )	( )	( )	( )	( )	( )
6. I'll probably be healthier when I'm older if I follow my meal plan now.	( )	( )	( )	( )	( )	( )
7. Testing my sugar levels helps me control my diabetes.	( )	( )	( )	( )	( )	( )
8. It's not worth the trouble to exercise regularly.	( )	( )	( )	( )	( )	( )

	Doesn't Apply	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
9. I can control my diabetes whether or not I follow my meal plan.	( )	( )	( )	( )	( )	( )
10. I'll probably have medical problems in the future even if I take my insulin as I'm supposed to.	( )	( )	( )	( )	( )	( )
11. Taking care of my feet is more trouble than it's worth.	( )	( )	( )	( )	( )	( )
12. Taking my diabetes pills helps me feel better.	( )	( )	( )	( )	( )	( )
13. I can help prevent serious health problems by seeing my doctor regularly.	( )	( )	( )	( )	( )	( )
14. I feel healthy whether or not I test my sugar levels as often as I'm supposed to.	( )	( )	( )	( )	( )	( )
15. Adjusting my insulin based on my sugar levels helps me control my diabetes.	( )	( )	( )	( )	( )	( )
16. Testing my ketone levels is important for me to avoid serious health problems.	( )	( )	( )	( )	( )	( )
17. I feel healthy no matter what or when I eat.	( )	( )	( )	( )	( )	( )
18. Taking my insulin on schedule helps me feel better.	( )	( )	( )	( )	( )	( )

FEELINGS ABOUT YOUR DIABETES

This measure assesses participants' belief in the effectiveness of their diabetes management plan. Participants are asked about their beliefs related to glucose and ketone testing, insulin, diet, and exercise. This measure is appropriate for adolescents and preadolescents who are responsible for their diabetes management.

PURPOSE

Information about participants' belief in the effectiveness of their diabetes management plan may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate a need to strengthen participants' appreciation for the value of their management plans.
- When this measure is administered prior to and following a program, it is possible to evaluate changes in participants' beliefs about their management plans.

PROCEDURES

This instrument can be administered both at the beginning and at the end of the program. However, handbook users should be alert to concerns regarding the potential reactivity of affective measures. A measure is considered *reactive* if the experience of completing the measure prior to the program causes participants to react differently to the program. Handbook users should, therefore, carefully review each affective measure that they wish to use to determine its potential for making participants unduly sensitive to aspects of the program. If a measure is determined to be reactive, then program personnel should *not* administer that measure to *all* participants as a pretest and posttest. Instead, the measure could be administered to half of the program participants prior to program participation to determine participants' pre-program status. The measure could then be administered to the other half of the participants after program participation to assess participants' post-program status.

SCORING AND ANALYSIS

Point values are assigned to responses as follows:

Item No.	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
1	5	4	3	2	1
2	5	4	3	2	1
3	1	2	3	4	5
4	1	2	3	4	5
5	1	2	3	4	5
6	5	4	3	2	1
7	5	4	3	2	1
8	1	2	3	4	5
9	5	4	3	2	1
10	5	4	3	2	1
11	1	2	3	4	5
12	5	4	3	2	1
13	5	4	3	2	1
14	1	2	3	4	5

This measure can be scored by adding the point values of all responses for all participants and dividing this total by the number of responses. Blank items should not be counted in the number of responses. The maximum attainable score of 5 points indicates a strong belief in the effectiveness of the diabetes management plan. A minimum score of 1 indicates weak belief in the effectiveness of the diabetes management plan.

FEELINGS ABOUT YOUR DIABETES

The sentences below are about taking care of your diabetes. Put a check to show how much you agree or disagree with each sentence. There are no right or wrong answers.

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
1. Eating the right foods helps me control my diabetes.	( )	( )	( )	( )	( )
2. Exercise helps me feel better.	( )	( )	( )	( )	( )
3. Testing my sugar levels when I'm supposed to is more trouble than it's worth.	( )	( )	( )	( )	( )
4. I'll probably have health problems when I'm older even if I take my insulin as I'm supposed to.	( )	( )	( )	( )	( )
5. I can eat sweets any time and still feel fine.	( )	( )	( )	( )	( )
6. I'll probably be healthier when I'm older if I follow my meal plan now.	( )	( )	( )	( )	( )
7. Testing my sugar levels helps me control my diabetes.	( )	( )	( )	( )	( )
8. I can control my diabetes whether or not I eat my meals when I'm supposed to.	( )	( )	( )	( )	( )
9. Taking my insulin on time helps me feel better.	( )	( )	( )	( )	( )
10. I can help prevent serious health problems by doing what my doctor says.	( )	( )	( )	( )	( )

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
11. I feel healthy whether or not I test my sugar levels as often as I'm supposed to.	( )	( )	( )	( )	( )
12. Changing my insulin based on my sugar levels helps me control my diabetes.	( )	( )	( )	( )	( )
13. Testing my ketone levels is important for me to avoid health problems.	( )	( )	( )	( )	( )
14. I feel fine no matter what or when I eat.	( )	( )	( )	( )	( )

CAN YOU MANAGE YOUR DIABETES?

This affective measure assesses participants' perceived ability to use their diabetes management plan. Participants are asked about their perceptions regarding their ability to take medication (insulin or diabetes pills), test blood glucose levels, follow a meal plan, and follow an exercise program. This measure is appropriate for adults.

PURPOSE

Information about participants' perceived ability to follow their diabetes management plan may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants have a low perceived ability to follow their management plan and, therefore, need training appropriate to this area.
- When this measure is administered prior to and following a program, it is possible to evaluate changes in participants' perceived ability to follow their management plan.

PROCEDURES

This instrument can be administered both at the beginning and at the end of the program. However, handbook users should be alert to concerns regarding the potential reactivity of affective measures. A measure is considered *reactive* if the experience of completing the measure prior to the program causes participants to react differently to the program. Handbook users should, therefore, carefully review each affective measure that they wish to use to determine its potential for making participants unduly sensitive to aspects of the program. If a measure is determined to be reactive, then program personnel should *not* administer that measure to *all* participants as a pretest and posttest. Instead, the measure could be administered to half of the program participants prior to program participation to determine participants' pre-program status. The measure could then be administered to the other half of the participants after program participation to assess participants' post-program status.

SCORING AND ANALYSIS

Items 1, 6, 9, 13, and 16 are not scored. For the remaining items, point values are assigned to responses as follows:

Definitely Yes	=	5
Probably Yes	=	4
Maybe	=	3
Probably No	=	2
Definitely No	=	1

Note: Items 5, 8, 12, 15, and 18 consist of several sets of responses. Point values should be assigned to each response.

This measure can be scored in two ways:

- A *total score* can be computed by adding the point values of all responses for all participants and dividing this total by the number of responses. Blank items should not be counted in the number of responses. The maximum attainable score of 5 points indicates a strong perceived ability to follow the diabetes management plan across a variety of situations. A minimum score of 1 indicates a lack of perceived ability to follow the diabetes management plan across a variety of situations.

  EXAMPLE: Imagine that there are 10 program participants. First assign the appropriate points to the marked responses. Add up all the points. We will use a total of 870. Divide this total by the total number of responses from all participants. We will use 290 responses for this example. Divide 840 by 290 to get an average score of 3.0.

- *Component scores* can be computed for each of the five sections (insulin, diabetes pills, blood glucose testing, diet, and exercise). Add the point values of the responses of those participants who completed the section of interest. Divide this total by the number of responses for the section. Blank items should not be counted in the number of responses. The maximum attainable score of 5 points indicates a strong perceived ability to use the particular component. A minimum score of 1 indicates a lack of perceived ability to use the particular component.

  EXAMPLE: Imagine that there are 5 program participants who completed the insulin section. First assign points to the marked responses. Add up all the points. We will use a total of 100. Divide this total by the total number of responses from participants who completed the insulin section. We will use 25 responses for this example. (The total possible number of responses is 30 if all 5 participants left no items blank.) Divide 100 by 25 to get an average score of 4.0.

CAN YOU MANAGE YOUR DIABETES?

This survey is about your ability to follow different parts of your diabetes management plan. Please mark one answer for each question. There are no right or wrong answers.

1. Do you give yourself insulin?

   ( ) Yes (Go to question 2)

   ( ) No (Go to question 6)

	Definitely Yes	Probably Yes	Maybe	Probably No	Definitely No
2. Can you give yourself insulin correctly?	( )	( )	( )	( )	( )
3. Can you give yourself insulin *when* you are supposed to?	( )	( )	( )	( )	( )
4. Can you adjust your insulin dose based on your sugar levels?	( )	( )	( )	( )	( )
5. Can you give yourself insulin when . . .					
a. you are visiting friends or family?	( )	( )	( )	( )	( )
b. you are sick?	( )	( )	( )	( )	( )
c. you are upset or under stress?	( )	( )	( )	( )	( )

6. Do you take pills for your diabetes?

( ) Yes (Go to question 7)

( ) No (Go to question 9)

	Definitely Yes	Probably Yes	Maybe	Probably No	Definitely No
7. Can you take your diabetes pills *when* you are supposed to?	( )	( )	( )	( )	( )
8. Can you take your diabetes pills when . . .					
a. you are away on vacation?	( )	( )	( )	( )	( )
b. you are staying with other people?	( )	( )	( )	( )	( )
c. you are sick?	( )	( )	( )	( )	( )
d. you are very busy?	( )	( )	( )	( )	( )
e. you are upset or under stress?	( )	( )	( )	( )	( )

9. Do you test your blood sugar levels?

( ) Yes (Go to question 10)

( ) No (Go to question 13)

	Definitely Yes	Probably Yes	Maybe	Probably No	Definitely No
10. Can you test your blood sugar levels correctly?	( )	( )	( )	( )	( )
11. Can you test your blood sugar levels *when* you are supposed to?	( )	( )	( )	( )	( )
12. Can you test your blood sugar levels when . . .					
a. you are at work?	( )	( )	( )	( )	( )
b. you are out with other people?	( )	( )	( )	( )	( )
c. you have guests visiting?	( )	( )	( )	( )	( )
d. you are sick?	( )	( )	( )	( )	( )
e. you are upset or under stress?	( )	( )	( )	( )	( )
f. you are tired?	( )	( )	( )	( )	( )

13. Has it been suggested that you follow a special meal plan for your diabetes?

( ) Yes (Go to question 14)

( ) No (Go to question 16)

	Definitely Yes	Probably Yes	Maybe	Probably No	Definitely No
14. Can you follow your meal plan?	( )	( )	( )	( )	( )
15. Can you follow your meal plan when . . .					
a. you are around food not on your meal plan?	( )	( )	( )	( )	( )
b. you are eating out?	( )	( )	( )	( )	( )
c. you are visiting friends or family?	( )	( )	( )	( )	( )
d. you are upset or under stress?	( )	( )	( )	( )	( )
e. you are sick?	( )	( )	( )	( )	( )
f. you are sad or lonely?	( )	( )	( )	( )	( )
g. you are very busy?	( )	( )	( )	( )	( )
h. it's a special occasion or holiday?	( )	( )	( )	( )	( )

16. Has it been recommended that you follow a regular exercise plan?

( ) Yes (Go to question 17)

( ) No (You have completed this survey. Thank you.)

	Definitely Yes	Probably Yes	Maybe	Probably No	Definitely No
17. Can you follow the exercise plan that was recommended for you?	( )	( )	( )	( )	( )
18. Can you follow your exercise plan when . . .					
a. you are away on vacation?	( )	( )	( )	( )	( )
b. you are upset or under stress?	( )	( )	( )	( )	( )
c. you are very busy?	( )	( )	( )	( )	( )
d. you are tired?	( )	( )	( )	( )	( )
e. there is no one to join you?	( )	( )	( )	( )	( )

You have completed this survey. Thank you.

CAN YOU TAKE CARE OF YOUR DIABETES?

This affective measure assesses participants' perceived ability to use their diabetes management plan. Participants are asked about their perceptions regarding their ability to take insulin, test blood glucose levels, follow a meal plan, and follow an exercise program. This measure is appropriate for adolescents and preadolescents who are responsible for their diabetes management.

PURPOSE

Information about participants' perceived ability to follow their diabetes management plan may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants have a low perceived ability to follow their management plan and, therefore, need training appropriate to this area.
- When this measure is administered prior to and following a program, it is possible to evaluate change in participants' perceived ability to follow their management plan.

PROCEDURES

This instrument can be administered both at the beginning and at the end of the program. However, handbook users should be alert to concerns regarding the potential reactivity of affective measures. A measure is considered *reactive* if the experience of completing the measure prior to the program causes participants to react differently to the program. Handbook users should, therefore, carefully review each affective measure that they wish to use to determine its potential for making participants unduly sensitive to aspects of the program. If a measure is determined to be reactive, then program personnel should *not* administer that measure to *all* participants as a pretest and posttest. Instead, the measure could be administered to half of the program participants prior to program participation to determine participants' pre-program status. The measure could then be administered to the other half of the participants after program participation to assess participants' post-program status.

SCORING AND ANALYSIS

Items 1, 6, 10, and 13 are not scored. For the remaining items, point values are assigned to responses as follows:

Definitely Yes	=	5
Probably Yes	=	4
Maybe	=	3
Probably No	=	2
Definitely No	=	1

Note: Items 5, 9, 12, and 15 consist of several sets of responses. Point values should be assigned to each response.

This measure can be scored in two ways:

- A *total score* can be computed by adding the point values of all responses for all participants and dividing this total by the number of responses. Blank items should not be counted in the number of responses. The maximum attainable score of 5 points indicates a strong perceived ability to follow the diabetes management plan across a variety of situations. A minimum score of 1 indicates a lack of perceived ability to follow the diabetes management plan across a variety of situations.

  EXAMPLE: Imagine that there are 10 program participants. First assign the appropriate points to the marked responses. Add up all the points. We will use a total of 800. Divide this total by the total number of responses from all participants. We will use 250 responses for this example. (The total possible number of points is 260 if all 10 participants left no items blank.) Divide 800 by 250 to get an average score of 3.2.

- *Component scores* can be computed for each of the four sections (insulin, blood glucose testing, diet, and exercise). Add the point values of the responses of those participants who completed the section of interest. Divide this total by the number of responses for the section. Blank items should not be computed in the number of responses. The maximum attainable score of 5 points indicates a strong perceived ability to use the particular component. A minimum score of 1 indicates a lack of perceived ability to use the particular component.

  EXAMPLE: Imagine that there are 5 program participants who completed the blood glucose testing section. First assign points to the marked responses. Add up all the points. We will use a total of 140. Divide this total by the total number of responses from participants who completed the blood glucose testing section. We will use 35 responses for this example. (The total possible number of responses is 40 if all 5 participants left no items blank.) Divide 140 by 35 to get an average score of 4.0.

CAN YOU TAKE CARE OF YOUR DIABETES?

The questions below are about taking care of your diabetes. Please mark the answer that best tells what you can do. There are no right or wrong answers.

1. Do you give yourself insulin shots?
   ( ) Yes (Go to question 2)
   ( ) No (Go to question 6)

		Definitely Yes	Probably Yes	Maybe	Probably No	Definitely No
2.	Can you give yourself insulin shots correctly?	( )	( )	( )	( )	( )
3.	Can you give yourself insulin shots *when* you are supposed to?	( )	( )	( )	( )	( )
4.	Can you change the amount of insulin you take when your sugar levels are too high or too low?	( )	( )	( )	( )	( )
5.	Can you give yourself insulin shots when . . .					
	a. you are visiting friends?	( )	( )	( )	( )	( )
	b. you are sick?	( )	( )	( )	( )	( )
	c. you are upset?	( )	( )	( )	( )	( )
	d. you are very busy?	( )	( )	( )	( )	( )

6. Do you test your blood sugar levels?
   ( ) Yes (Go to question 7)
   ( ) No (Go to question 10)

	Definitely Yes	Probably Yes	Maybe	Probably No	Definitely No
7. Can you test your blood sugar levels correctly?	( )	( )	( )	( )	( )
8. Can you test your blood sugar levels *when* you are supposed to?	( )	( )	( )	( )	( )
9. Can you test your blood sugar levels when . . .					
a. you are at school?	( )	( )	( )	( )	( )
b. you are visiting someone you don't know very well?	( )	( )	( )	( )	( )
c. you have friends visiting you?	( )	( )	( )	( )	( )
d. you are sick?	( )	( )	( )	( )	( )
e. you are upset?	( )	( )	( )	( )	( )
f. you are tired?	( )	( )	( )	( )	( )

10. Are you supposed to follow a special meal plan (eat healthy meals and snacks at about the same time each day)?

( ) Yes (Go to question 11)

( ) No (Go to question 13)

		Definitely Yes	Probably Yes	Maybe	Probably No	Definitely No
11.	Can you follow your meal plan?	( )	( )	( )	( )	( )
12.	Can you follow your meal plan when . . .					
	a. you are around food that you're not supposed to eat?	( )	( )	( )	( )	( )
	b. you are eating out at a restaurant?	( )	( )	( )	( )	( )
	c. you are eating at a friend's house?	( )	( )	( )	( )	( )
	d. you are at a party?	( )	( )	( )	( )	( )
	e. you are sick?	( )	( )	( )	( )	( )
	f. it's a special day or a holiday?	( )	( )	( )	( )	( )

13. Are you supposed to follow an exercise plan to help take care of your diabetes?

( ) Yes (Go to question 14)

( ) No (You have finished this survey. Thank you.)

		Definitely Yes	Probably Yes	Maybe	Probably No	Definitely No
14.	Can you follow your exercise plan?	( )	( )	( )	( )	( )
15.	Can you follow your exercise plan when . . .					
	a. you are away on a trip?	( )	( )	( )	( )	( )
	b. you are upset?	( )	( )	( )	( )	( )
	c. there is no one to do it with you?	( )	( )	( )	( )	( )

You have finished with survey. Thank you.

INTENTIONS REGARDING YOUR DIABETES MANAGEMENT PLAN

This affective measure assesses participants' intention to use their diabetes management plan. Participants are asked about their intentions related to medication (insulin or diabetes pills), blood glucose testing, diet, and exercise. This measure is appropriate for adults.

If this measure seems useful, program personnel may also want to consider administering the **Diabetes Management Plan**, which is a behavior measure assessing participants' *actual* use of their diabetes management plan.

PURPOSE

Information about participants' intention to follow their diabetes management plan may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants have little or no intention to use their diabetes management plans and, therefore, need instruction appropriate to this area.
- When this measure is administered prior to and following a program, it is possible to evaluate changes in participants' intention to follow their diabetes management plans.

PROCEDURES

This instrument can be administered both at the beginning and at the end of the program. However, handbook users should be alert to concerns regarding the potential reactivity of affective measures. A measure is considered *reactive* if the experience of completing the measure prior to the program causes participants to react differently to the program. Handbook users should, therefore, carefully review each affective measure that they wish to use to determine its potential for making participants unduly sensitive to aspects of the program. If a measure is determined to be reactive, then program personnel should *not* administer that measure to *all* participants as a pretest and posttest. Instead, the measure could be administered to half of the program participants prior to program participation to determine participants' pre-program status. The measure could then be administered to the other half of the participants after program participation to assess participants' post-program status.

SCORING AND ANALYSIS

Items 1, 4, 6, 8, and 10 are not scored. For items 2, 3, 5, 7, 9, and 11, point values are assigned to responses as follows:

Definitely Yes	=	5
Probably Yes	=	4
Maybe	=	3
Probably No	=	2
Definitely No	=	1

This measure can be scored by adding the point values of all responses for all participants and dividing this total by the number of responses. Blank items should not be counted in the number of responses. The maximum attainable score of 5 points indicates a strong intention to follow the diabetes management plan for the next 12 months. A minimum score of 1 indicates weak intention to follow the diabetes management plan for the next 12 months.

EXAMPLE: Imagine that there are 10 program participants. First, assign the appropriate points to the marked responses. Add up all the points. We will use a total of 180. Divide this total by the total number of responses from all participants. We will use 40 responses for this example. Divide 180 by 40 to get an average score of 4.5.

INTENTIONS REGARDING YOUR DIABETES MANAGEMENT PLAN

This survey asks about your intentions to follow different parts of your diabetes management plan. Mark the answer that indicates your intentions FOR THE NEXT 12 MONTHS.

1. Does your management plan include giving yourself insulin?
   ( ) Yes (Go to question 2)
   ( ) No (Go to question 4)

2. Do you intend to give yourself insulin *when* you are supposed to?
   ( ) Definitely yes
   ( ) Probably yes
   ( ) Maybe
   ( ) Probably no
   ( ) Definitely no

3. Do you intend to adjust your insulin dose based on your sugar levels?
   ( ) Definitely yes
   ( ) Probably yes
   ( ) Maybe
   ( ) Probably no
   ( ) Definitely no

4. Does your management plan include taking diabetes pills?
   ( ) Yes (Go to question 5)
   ( ) No (Go to question 6)

5. Do you intend to take your diabetes pills *when* you are supposed to?
   ( ) Definitely yes
   ( ) Probably yes
   ( ) Maybe
   ( ) Probably no
   ( ) Definitely no

6. Does your management plan include testing your blood sugar levels?
   ( ) Yes (Go to question 7)
   ( ) No (Go to question 8)

7. Do you intend to test your blood sugar levels *when* you are supposed to?
   ( ) Definitely yes
   ( ) Probably yes
   ( ) Maybe
   ( ) Probably no
   ( ) Definitely no

8. Has it been suggested that you follow a special meal plan for your diabetes?
   ( ) Yes (Go to question 9)
   ( ) No (Go to question 10)

9. Do you intend to follow your meal plan?
   ( ) Definitely yes
   ( ) Probably yes
   ( ) Maybe
   ( ) Probably no
   ( ) Definitely no

10. Has it been recommended that you follow a regular exercise plan?
    ( ) Yes (Go to question 11)
    ( ) No (You have completed this survey. Thank you.)

11. Do you intend to follow the exercise plan that was recommended for you?
    ( ) Definitely yes
    ( ) Probably yes
    ( ) Maybe
    ( ) Probably no
    ( ) Definitely no

You have completed this survey. Thank you.

WILL YOU TRY TO TAKE CARE OF YOUR DIABETES?

This affective measure assesses participants' intention to use their diabetes management plan. Participants are asked about their intentions related to insulin, blood glucose testing, diet, and exercise. This measure is appropriate for adolescents and preadolescents who are responsible for their diabetes management.

If this measure seems useful, program personnel may also want to consider administering **Your Diabetes Management Plan**, which is a behavior measure assessing participants' *actual* use of their diabetes management plan.

PURPOSE

Information about participants' intention to follow the diabetes management plan may be useful for the following reasons:

- Administration of this measure at the beginning of the program may provide needs assessment information. For example, results of this measure may indicate that participants have little or no intention to use their diabetes management plans and, therefore, need instruction appropriate to this area.
- When this measure is administered prior to and following a program, it is possible to evaluate changes in participants' intention to follow their diabetes management plans.

PROCEDURES

This instrument can be administered both at the beginning and at the end of the program. However, handbook users should be alert to concerns regarding the potential reactivity of affective measures. A measure is considered *reactive* if the experience of completing the measure prior to the program causes participants to react differently to the program. Handbook users should, therefore, carefully review each affective measure that they wish to use to determine its potential for making participants unduly sensitive to aspects of the program. If a measure is determir to be reactive, then program personnel should *not* administer that measu to *all* participants as a pretest and posttest. Instead, the measure could be administered to half of the program participants prior to program participation to determine participants' pre-program status. The measure could then be administered to the other half of the participants after program participation to assess participants' post-program status.

SCORING AND ANALYSIS

Items 1, 4, 6, and 8 are not scored. For items 2, 3, 5, 7, and 9, point values are assigned to responses as follows:

Definitely Yes	=	5
Probably Yes	=	4
Maybe	=	3
Probably No	=	2
Definitely No	=	1

This measure can be scored by adding the point values of all responses for all participants and dividing this total by the number of responses. Blank items should not be counted in the number of responses. The maximum attainable score of 5 points indicates a strong intention to follow the diabetes management plan for the next 12 months. A minimum score of 1 indicates weak intention to follow the diabetes management plan for the next 12 months.

EXAMPLE: Imagine that there are 5 program participants. First assign the appropriate points to the marked responses. Add up all the points. We will use a total of 80. Divide this total by the total number of responses from all participants. We will use 20 responses for this example. (The total possible number of responses is 25 if all 5 participants left no items blank.) Divid 80 by 20 to get an average score of 4.0.

WILL YOU TRY TO TAKE CARE OF YOUR DIABETES?

The questions below ask if you will try to take care of your diabetes. Mark the answer that shows what you think you will do FOR THE NEXT 12 MONTHS.

1. Are you supposed to give yourself insulin shots?
   ( ) Yes (Go to question 2)
   ( ) No (Go to question 4)

2. Will you try to give yourself insulin injections *when* you are supposed to?
   ( ) Definitely yes
   ( ) Probably yes
   ( ) Maybe
   ( ) Probably no
   ( ) Definitely no

3. Will you try to change the amount of insulin you take when your sugar levels are too high or too low?
   ( ) Definitely yes
   ( ) Probably yes
   ( ) Maybe
   ( ) Probably no
   ( ) Definitely no

4. Are you supposed to test your blood sugar levels?
   ( ) Yes (Go to question 5)
   ( ) No (Go to question 6)

5. Will you try to test your blood sugar levels *when* you are supposed to?
   ( ) Definitely yes
   ( ) Probably yes
   ( ) Maybe
   ( ) Probably no
   ( ) Definitely no

6. Are you supposed to follow a special meal plan (eat healthy meals and snacks at about the same time each day)?
   ( ) Yes (Go to question 7)
   ( ) No (Go to question 8)

7. Will you try to follow your meal plan?
   ( ) Definitely yes
   ( ) Probably yes
   ( ) Maybe
   ( ) Probably no
   ( ) Definitely no

8. Are you supposed to exercise to help control your diabetes?
   ( ) Yes (Go to question 9)
   ( ) No (You have finished the survey. Thank you.)

9. Will you try to exercise as you are supposed to?
   ( ) Definitely yes
   ( ) Probably yes
   ( ) Maybe
   ( ) Probably no
   ( ) Definitely no

You have finished this survey. Thank you.

GENERAL INFORMATION FORM

This information form asks program participants to provide demographic information. This form is appropriate for adults.

PURPOSE

General information about program participants may be useful for the following reasons:

- Administration of this form at the beginning of the program may provide needs assessment information. For example, information provided, such as participants' ages and types of management strategies, may be used to make decisions about how to allocate instructional time.
- Administration of this form can determine if the program is adequately reaching the target audience.

PROCEDURES

Distribute and collect this form at the beginning of the program. Explain to program participants that the information collected will be used to examine how well the program is serving the participants and the community.

SCORING AND ANALYSIS

In general, this form should be scored by calculating the percentage of participants who responded "yes" to each category. The mean and standard deviation should be calculated for participants' age.

GENERAL INFORMATION FORM

Today's Date: _____ Your Zip Code: _____

Age: _____ Sex: ____ M ____ F Height: _____ Weight: _____

Ethnicity: ____ White ____ Black ____ Hispanic ____ Asian ____ American Indian ____ Other

Do you take insulin? ____ Yes ____ No

Do you take pills for your diabetes? ____ Yes ____ No

If female, are you pregnant? ____ Yes ____ No

Age when diabetes first diagnosed: _____

Marital status:

____ Never married

____ Married

____ Separated/Divorced

____ Widowed

How much schooling have you **completed?**

____ Less than eighth grade

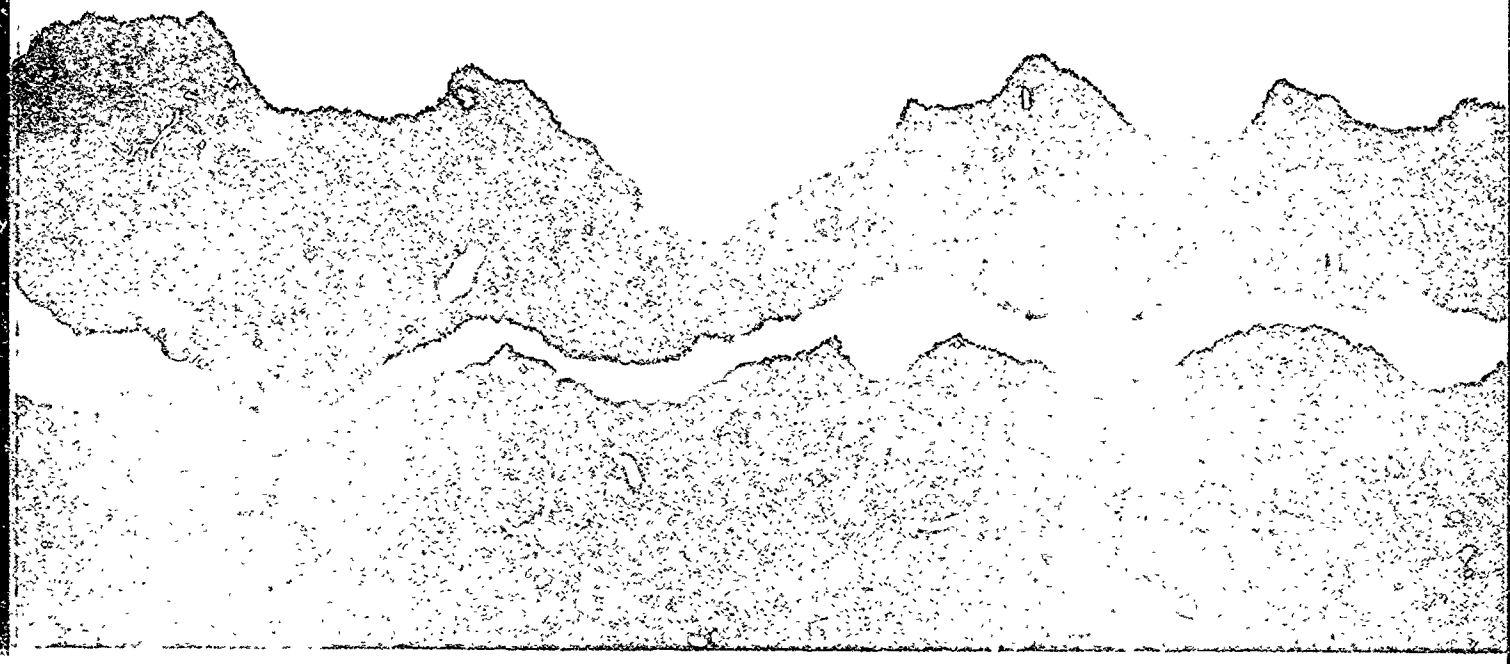
____ High school

____ College

____ Postgraduate work (Masters, Ph.D.)

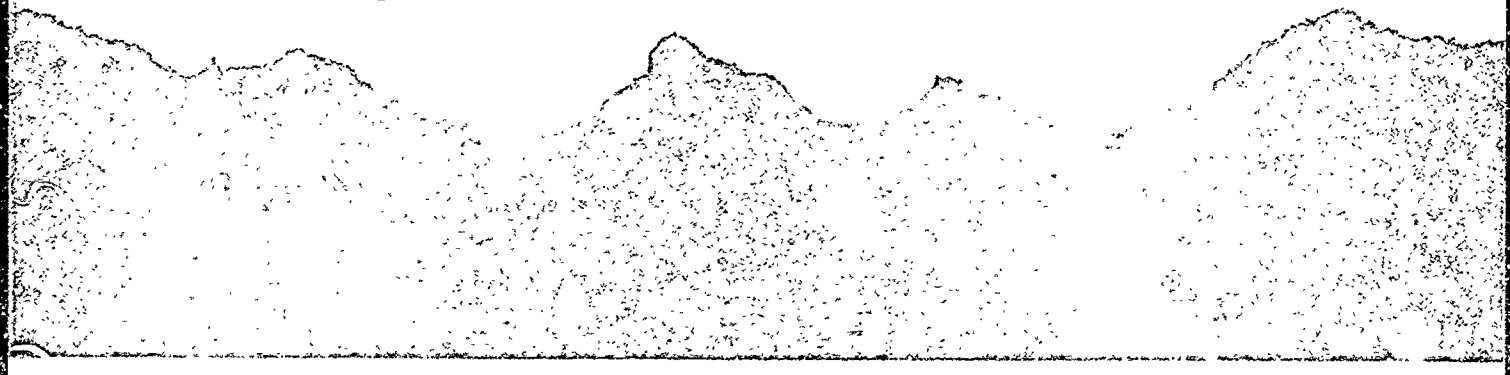
Have you received education about your diabetes before?

____ Yes ____ No ____ Don't know



CHAPTER FOUR

Locally Conducted Psychometric Studies



Locally Conducted Psychometric Studies

As described in Chapter One, the first step in using the newly developed handbook measures to examine program effectiveness is to select those measures that match program goals. However, evaluators cannot assume that a measure that appears to assess a desired program outcome will produce valid data about that outcome. When evaluators use a measure, they first want to determine the technical quality of that measure to ensure that any conclusions drawn about a program's effects are warranted. The purpose of this chapter is to assist evaluators in conducting validation studies for those handbook measures chosen for use in program evaluation.

Determining the Technical Quality of Measuring Devices

The degree to which a measuring instrument yields scores from which one can make legitimate inferences is referred to as validity. Tests are not valid or invalid. Rather, it is the inferences made, based on test results, that are valid or invalid. It is, therefore, technically accurate to focus on the *validity of score-based inferences* rather than the validity of a particular measuring device.

The concept of validity is highly dependent on the particular way in which a measuring instrument will be used. For example, a performance assessment that measures blood glucose testing may permit a valid inference regarding the *ability* of program participants to test their blood sugar levels, but will yield invalid inferences regarding the *frequency* with which participants use this skill. Furthermore, a test may yield valid inferences for a particular purpose with one population but invalid inferences for the same purpose with a different population. Thus, because validity varies on the basis of purpose and population, it is most appropriate to examine validity in the setting in which a measure will be used.

A second factor in determining the technical quality of a measurement instrument deals with the extent to which the instrument produces reliable, that is, consistent, results. Because the newly developed handbook measures have been subjected only to small-scale field tests, no reliability data are currently available. It is hoped that handbook users will conduct their own reliability studies and share those results with the Centers for Disease Control. In this way, results can be compiled over time and, subsequently, provided to handbook users. Procedures for evaluating the reliability of the handbook measures will be presented following the discussion of local validation approaches.

Categories of Validity Evidence

There are three major types of evidence regarding validity. These include content-related evidence of validity, criterion-related evidence of validity, and construct-related evidence of validity. The procedures for securing each type of validity evidence will be described below.

Content-related evidence of validity. Content-related evidence of validity involves the careful review of a measure's content by individuals identified as experts in the content area being assessed. This type of validity evidence is particularly important for measures designed to assess examinees' knowledge and skills. To secure positive content-related

validity, the measure must include only those items that correspond to the content area being assessed and its items must address all important facets of that content area. The systematic, expertise-rooted procedures used to develop this handbook's instruments helped to ensure that appropriate content was built into the measures. Subsequent reviews by external experts confirmed that the measures are, indeed, focused on suitable content. These development procedures and the role of expert advisors in the project are described in the handbook's preface.

If there are questions regarding the suitability of the content in any of the handbook's measures, content-related validity can be examined by assembling a panel of experts who can judge the suitability of a measure's content for the specific program-evaluation purpose for which the measure is to be used. A panel of approximately 10 knowledgeable individuals can be asked to review the measuring instrument's items, one by one, and render independent yes/no judgments regarding the appropriateness of each item's content (in relationship to the inference that the program evaluators wish to make on the basis of the measure). In addition, panelists can be asked to determine whether any important content has been omitted from the measure. For example, if a knowledge measure such as **The Complications of Diabetes** is being reviewed, panelists might be asked first to think of all the important information about diabetic complications that program participants must know and then to indicate the percentage of the information that is present in the measure being reviewed. This straightforward indication of a measure's content representativeness, when coupled with judgments regarding the content appropriateness of a measure's items, can yield important content-related evidence of validity for a measure.*

Criterion-related evidence of validity. Criterion-related evidence of validity requires that a measure be checked against an independent criterion. The independent criterion or standard should be one that the measure would be expected to predict. Criterion-related validity is most important for the handbook measures in the areas of behavior and intention. In the area of behavioral self-reports, for example, criterion-related validity would focus on the degree to which the self-reports reflect actual behavior. So, for example, criterion-related validity for a self-report instrument designed to measure use of the diabetes management plan would be secured by correlating responses on this instrument with observations (by others) of the extent to which the diabetes management plan was *actually* being used.

External criterion measures, such as observations, while often more accurate measures of behavior than self-reports, are extremely costly and time consuming to use. Thus although it may be possible to use such criterion measures in a one-time validity study, they typically will not eliminate the need for self-report instruments in routine program evaluations.

The general procedure for conducting a criterion-related validity study is shown in Figure 4.1.

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* For more information regarding how to conduct content-related validation studies, see Annotated Bibliography Nos. 18, 23, 27, and 34.

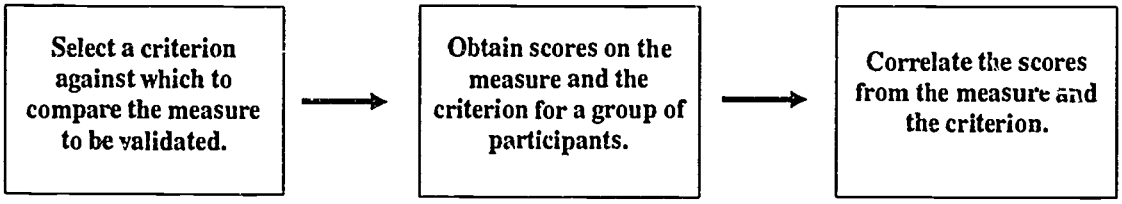

Figure 4.1: Procedure for conducting criterion-related validity studies

A correlation of approximately .50 or higher between the measure and criterion would indicate that the new measure is predictive of the external criterion measure and, therefore, is measuring what it is intended to measure. A low correlation would call into question the self-report instrument as a measure of the behavior of interest.

Each criterion-related validity study must be specifically designed for the particular measure being examined and the purpose for which the measure will be used. For example, imagine that an evaluator wanted to examine the criterion-related evidence of validity for the handbook's measure entitled **Intentions Regarding Your Diabetes Management Plan.** The evaluator must first identify an appropriate criterion measure. How is a program evaluator likely to use an intention measure? The most likely use would be to employ it as a proxy measure foreshadowing a program's effect on the future behavior of participants. That is, will program participants follow their diabetes management plans in the future? Thus, an appropriate criterion measure might be the reported use of the diabetes management plan several months after the program.

To assemble criterion-related evidence of validity for the intention measure, a program evaluator could administer the intention measure at the end of the program to a group of at least 30 participants (or repeat this process each session until responses from at least 30 participants are obtained) and obtain completed self-report surveys several months later regarding participants' use of the diabetes management plan. Once both measures are collected for every individual, a correlation could be computed between the strength of intention to follow the diabetes management plan and whether the diabetes management plan was being followed subsequent to the program. Thus, the criterion-related validity study would examine whether the intention measure was, in fact, predictive of later behavior. A measure that can serve as a meaningful proxy for participants' future behavior can prove highly useful in the evaluation of a program's impact on participants.*

Construct-related evidence of validity. The final type of validity evidence to be reviewed, construct-related evidence of validity, is particularly important for those handbook measures that do not have a clear criterion measure against which they can be evaluated. Such measures include the attitudinal and affective measures such as **Can You Manage**

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* For further information on the design and analysis of criterion-related validity studies, see Annotated Bibliography Nos. 18, 23, 27, and 34.

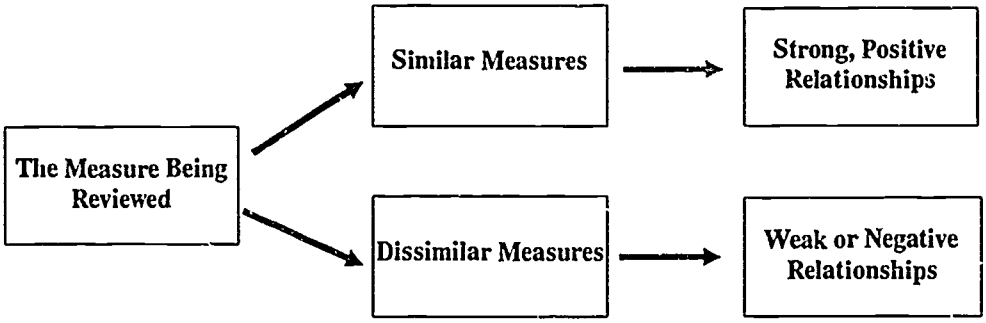

Figure 4.2: Correlations between measures assessing similar/dissimilar attitudinal dimensions

Your Diabetes?, a measure that examines an individual's perceived ability to follow a diabetes management plan. Construct-related validity involves the gradual accumulation of data regarding what a test measures. There are three customary strategies to securing construct-related evidence of validity for a measure. First, in the *related-measures strategy,* predictions can be tested about the extent to which the measure of interest is correlated with other measures. For example, perceived ability to follow a diabetes management plan should be positively related to other measures aimed at assessing a similar attribute but should show reduced correlations with measures tapping different attitudinal dimensions. Thus, other existing measures can be correlated with the measure of interest to help clarify what is being measured.

If the correlations are consistent with the prior predictions, then construct-related evidence of validity has been obtained to support the defensibility of inferences based on the measure's use. Figure 4.2 illustrates the anticipated correlations for the measure of interest with other similar and dissimilar measures.

A second approach to examining construct-related validity involves predictions about group differences and is referred to as a *differential-populations strategy*. For this procedure, two or more groups are identified which are expected, based on other characteristics, to perform differently on the measure of interest. For example, the two groups might consist of individuals who have had diabetes for years versus those who have just developed the disease. If the anticipated performance difference between the two groups is not obtained, it would call into question whether the test was measuring what it was thought to measure.

A third strategy for securing construct-related evidence of validity is referred to as an *intervention strategy* because it involves the use of interventions such as education programs. For instance, a measure examined via this strategy could be administered to a group of participants before and after a "proven" diabetes education program. If a difference in participants' scores on the measure is not observed, then the construct-related evidence of validity regarding the measure being reviewed is not supportive of the measure's use.

Construct-related evidence of validity is never based on a single study. Instead, consideration of a variety of studies, employing multiple validation strategies such as those described here, will help provide greater and greater clarification regarding the appropriateness of using a given measuring instrument.*

Types of Reliability

A second characteristic of a defensible measurement instrument is the reliability or consistency with which it measures. The reliability of a test can be examined in three distinct ways. These include test-retest reliability, alternate-forms reliability, and internal consistency. Each of these approaches will be described below.

Test-retest reliability. Test-retest reliability (also referred to as *stability* reliability) examines the extent to which a measurement instrument is consistent over testing occasions. That is, will an individual who received a particular score on one testing occasion receive a similar score on a different testing occasion. Typically, to secure test-retest reliability information, an instrument is administered once to a group of individuals (30 or more). The same instrument is then administered again under similar conditions to the same group of individuals approximately two to four weeks later. Individuals' scores from the two administrations are then correlated. The higher the correlation, the greater the stability of measurement over time. Short tests, or other tests that are likely to be easily remembered, may result in an overestimate of reliability if participants recall their answers, and hence, respond similarly on the second testing occasion.

Alternate-forms reliability. The knowledge and skill measures in this handbook have two forms which may be used for a pretest to posttest comparison. The administration of one form for the pretest and the other form for the posttest is desirable because the pretest may sensitize participants to pay more attention to those issues included on the pretest than to other equally important issues. However, to draw defensible conclusions based on the use of two different forms at pretest and posttest, the forms must be equivalent.

To examine alternate-forms reliability, it is necessary to administer both forms to the same group of individuals. The scores from the two forms can then be correlated. High correlations indicate that the same conclusions would be drawn about an individual or group of participants regardless of which of the two forms had been used. Thus, there would be reliable or consistent measurement across alternate forms. A high alternate-forms reliability coefficient does not guarantee that the forms are perfectly equidifficult. If the two forms are not of equal difficulty, that is, participants perform consistently better on one form than the other, it would still be possible to obtain high between-forms correlations. Thus, it is important to be attentive to mean scores on the two test forms. It is also permissible to use p-values (the percent of examinees getting each item correct) to reassign items to forms so

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* For more information on how to conduct construct-related validity studies, see Annotated Bibliography Nos. 18, 23, 27, and 34.

that they are more equidifficult. After the redistribution of items, a second alternate-forms reliability study should be conducted.

Handbook users should not assume equivalence or equidifficulty for the multiple forms provided in this handbook. Until alternate-forms reliability and test difficulty are examined, the measures should be used in a design such that half of the participants take Form A as a pretest and Form B as a posttest while the other half take Form B as a pretest and Form A as a posttest. This counterbalancing technique eliminates the possible influence of one form being more difficult than the other.

Internal consistency. Internal consistency examines the extent to which the instrument measures a single or related set of constructs. The higher the internal consistency, the greater the homogeneity of items on the test. A test thought to measure a single attitudinal dimension should have relatively high internal consistency reliability. Procedures for calculating internal consistency include split-half reliability, Kuder-Richardson formulas, and Cronbach's Alpha. The split-half reliability coefficient is calculated by administering the test to a group of at least 30 participants and then correlating scores from the odd versus the even items. A correction for test length must then be made using the Spearman-Brown formula. The split-half procedure is very similar to alternate-forms reliability in that two "forms" are correlated by separating the odd and even items. Kuder-Richardson formulas for internal consistency provide an estimate of the average of all possible split-halves. These formulas, like Spearman-Brown, require that test items be binary-scored, that is, able to be scored as right or wrong. Cronbach's Alpha is identical to Kuder-Richardson for binary-scored items but can also be used for items that yield responses to which several points can be assigned, such as items on **Feelings About Your Diabetes Management Plan.**

Not all forms of reliability need to be computed for every test. For example, alternate-forms reliability would be computed only for those measures that have two forms. Internal consistency estimates are less appropriate for multidimensional measures. Test-retest reliability is appropriate for most measures but often presents pragmatic problems due to the need to retest the same individuals.

Groups and Individuals

The validity and reliability procedures reviewed here were originally developed to examine the quality of tests used for *individual* assessment purposes. In contrast, the recommended use for the handbook measures is to perform *group* analyses for program evaluation. Thus, the appropriate reliability issue is whether scores for a group of individuals are relatively consistent. Similarly, the validity issue is whether changes in scores for a group of individuals are reflective of changes in the group's knowledge, skills, affect, or behavior. Because group scores are more stable than individual scores, the procedures outlined above are likely to underestimate the reliability and validity of the measures when used for

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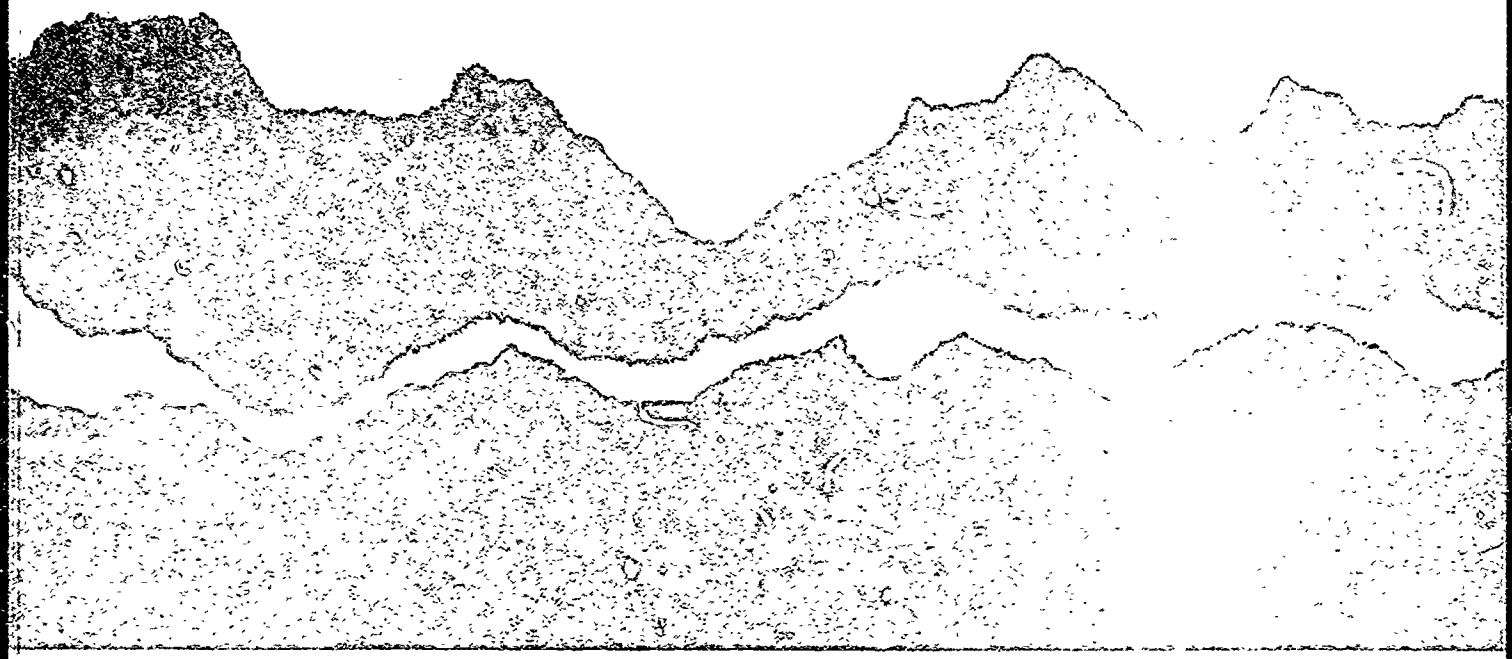
For more information on how to examine the reliability of measurement instruments, see Annotated Bibliography Nos. 3, 18, 19, 23, 27, and 34.

program evaluation. Practically speaking, a measurement instrument with a lower reliability or validity coefficient would be acceptable when used for group rather than individual diagnosis. For example, Salvia and Ysseldyke (1981, p. 98) have recommended the following minimum standards for alternate-forms reliability:

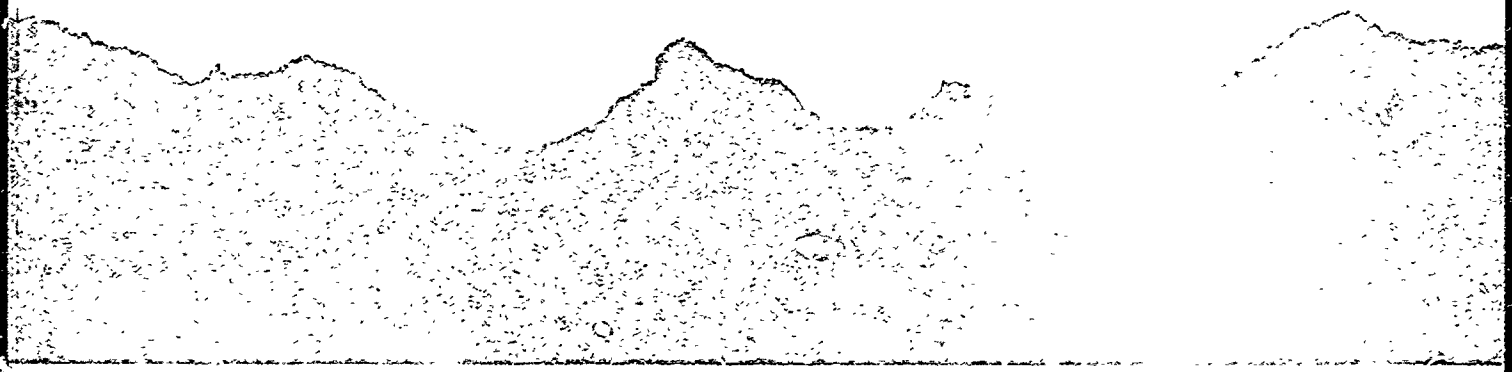
.60 - when scores are reported for groups
.80 - when scores are used for individual screening
.90 - when scores are used for important educational decisions for individuals

Thus, standards for acceptable reliability and validity vary depending on how a particular measure will be used. However, minimal levels for each are critical for making sound decisions about a program. With a little creativity and effort, studies of reliability and validity can often be integrated into the ongoing operation of a program.

In addition to providing a brief overview, the major purpose of this chapter was to encourage handbook users to conduct local reliability and validity studies and to consider the involvement of a measurement specialist or the use of appropriate references in designing such studies. As suggested at the outset of the chapter, if such local studies are carried out, results should be forwarded to the Centers for Disease Control (Attention: Dr. Diane Orenstein, Project Officer, Center for Health Promotion and Education, Centers for Disease Control, 1600 Clifton Road N.E., Atlanta, GA 30333). This information will be shared with future handbook users.



Appendices



Appendix A

AMPLIFIED CONTENT DESCRIPTORS*

DIABETES AND ITS MANAGEMENT
(Adult/Adolescent Measure)

DIABETES
(Preadolescent/Parent Measure)

General

1. Diabetes develops when the body does not produce enough insulin or the insulin produced is not effective, leading to an inability to use sugar for energy.
2. Eating large amounts of sugar does not cause diabetes.
3. At this time, diabetes can be controlled but not cured.
4. In order to keep diabetes in control, diet, exercise, and medication must be carefully balanced.
5. In order to make appropriate adjustments in their diet, amount of exercise, and insulin level, people with diabetes should obtain individualized instructions from their health care provider.
6. There are several different types of diabetes.
7. Type I (insulin-dependent) diabetes usually develops over a short period of time in children, adolescents, and young adults.
8. Type II (non-insulin-dependent) diabetes usually develops slowly in adults over 40 years of age.
9. Type I diabetes accounts for about 10% of all cases of diabetes.
10. Type II diabetes accounts for about 90% of all cases of diabetes.
11. People with diabetes should always wear and/or carry medical information stating that they have diabetes and take medication.
12. People with diabetes should be able to reach their health care providers or other medical help 24 hours a day.
13. People with diabetes should check with their health care provider before taking any new medication.

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* The amplified content descriptors are not exhaustive accounts of diabetes content.

14. Before giving a driver's license to a person with diabetes, most states require a doctor's signed statement that a person's diabetes is well controlled.

Monitoring

15. An important goal of diabetes management is to keep the blood sugar level as near to normal as possible.
16. Testing sugar levels provides information necessary to judge the effectiveness of a diabetes management plan.
17. When diabetes is first detected, testing for sugar levels may be done more frequently than will be necessary later, in order to plan the best treatment.
18. Health care providers use the results of sugar level testing to help plan a program of diet, exercise, and medication for people with diabetes.
19. People with diabetes use the results of sugar level testing to see how well their diabetes is being controlled.
20. With proper instruction, people with diabetes can make changes in their diabetes management plan based on sugar level test results.
21. Testing for sugar levels can be done at home and in a doctor's office.
22. Sugar level testing should always be done very carefully in order to prevent possible mistakes.
23. People with diabetes should accurately record the results of sugar level tests so that their health care provider can use the information to monitor the diabetes management plan.
24. People with diabetes should contact their health care provider if the results of sugar level testing are consistently higher or lower than the guidelines they were given.
25. Factors that influence sugar levels are diet, exercise, pregnancy, infection, illness, stress, and medication.
26. Health care providers usually recommend that people with diabetes who take insulin test their sugar levels several times a day.
27. People with diabetes who do not take insulin should test their sugar levels at intervals recommended by their health care provider.
28. Sugar level testing needs to be done more often than usual during times of heavy exercise or illness, during pregnancy, or when insulin or oral medication dosages have been changed.
29. Blood testing for sugar levels is done by placing a drop of blood on a special chemical testing strip and either comparing the color of the strip to a chart or placing the strip into a small meter to be read.
30. Because there are many types of blood glucose meters, people with diabetes must understand and follow the instructions for the type of meter they are using.
31. Urine testing for sugar levels is not as effective as blood testing, but may be useful for some people.

32. Because there are many types of urine tests, people with diabetes must understand and follow the instructions for the type of test they are using.
33. Blood testing for sugar levels is necessary to double-check the results of urine testing.
34. Glycosylated hemoglobin (hemoglobin A_1C) is a blood test done in the doctor's office that indicates a person's average blood glucose level for the past few months.
35. People with type I diabetes may have to check their urine for the presence of ketones.
36. People with type II diabetes usually do not have to check their urine for ketones, except when they are ill.
37. Testing the urine for ketones is a useful procedure that can be done at home and in a doctor's office.
38. Ketones in the urine of a person with diabetes mean that fat instead of sugar is being used for energy.

Recognizing and Treating Hypoglycemia

39. Hypoglycemia is low blood sugar.
40. Hypoglycemia should be defined by a person's health care provider as there is not one universal number for low blood sugar.
41. Among people with diabetes who take insulin, hypoglycemia is sometimes called an "insulin reaction."
42. Common causes of hypoglycemia are too much insulin or oral hypoglycemic medication, too little food, and/or too much exercise.
43. Hypoglycemia usually causes people with diabetes to feel anxious, shaky, sweaty, hungry, weak, dizzy, or confused.
44. Sometimes hypoglycemia causes people with diabetes to lose consciousness.
45. People with diabetes should test their sugar level if they feel the signs of hypoglycemia.
46. A quick treatment for hypoglycemia is to eat or drink simple, fast-acting sugars, such as sugar cubes, orange juice, hard candy, regular soft drinks, honey, syrup, or glucose tablets.
47. A glucagon injection should be given to a person with diabetes who is experiencing severe hypoglycemia and cannot swallow or will not eat sugar.
48. Family members and friends can be taught to give glucagon injections.
49. People with diabetes should be taken to the hospital if they do not respond to either sugar intake or glucagon injections.
50. Ways to prevent hypoglycemia are to eat the prescribed meal plan, not delay or miss meals, and avoid sudden changes in insulin injections or amount of exercise.
51. People with diabetes should always carry some sugar, such as sugar cubes or glucose tablets, to use in case hypoglycemia occurs.

52. The family and friends of people with diabetes should be taught to recognize and treat hypoglycemia.

Recognizing and Treating Hyperglycemia

53. Hyperglycemia is high blood sugar.
54. Common causes of hyperglycemia are stress, illness, too little insulin, too much food, and/or too little exercise.
55. Hyperglycemia usually causes people with diabetes to feel thirsty, tired, and/or nauseated, urinate frequently, breathe deeply and rapidly, and have blurred vision.
56. When sugar levels are high, people with diabetes should test their blood sugar and urine ketone levels often, change their diet, and/or take more insulin if instructed to do so.
57. People with diabetes should call their health care provider if their sugar levels remain high for several days and urine testing for ketones is positive.
58. If blood sugar levels increase because of a lack of effective insulin, high levels of acids can accumulate in the blood.
59. High levels of acids in the blood lead to diabetic ketoacidosis (diabetic coma).
60. The beginning of diabetic ketoacidosis can be detected by frequently testing blood sugar levels and urine ketone levels.
61. In older patients with type II diabetes, high blood sugar can lead to a serious condition called hyperosmolar coma.
62. The beginning of hyperosmolar coma can be detected by frequently testing blood sugar levels.

Insulin

63. People with type I (insulin-dependent) diabetes produce little or no insulin within their body.
64. People with type I diabetes must inject insulin in order to stay healthy.
65. People with type II (non-insulin-dependent) diabetes may need to take insulin when other treatments are not effective.
66. Insulin lowers blood sugar levels.
67. Insulin allows sugar to enter cells and produce energy.
68. Without insulin, sugar stays in the blood causing hyperglycemia.
69. Injectable insulin comes from various sources including cows, pigs, and humans.
70. There are many types of insulin including humulin, regular, semilente, NPH, lente, PZI, ultralente, and mixtures of these.
71. Each type of insulin has a different time pattern of hypoglycemic activity in the body and can be classified as either short-acting, intermediate-acting, or long-acting.

72. Short-acting insulin starts working very quickly and works best at lowering blood sugar about 2 to 4 hours after the injection.

73. Intermediate-acting insulin works best about 8 to 16 hours after the injection.

74. Long-acting insulin works best about 14 to 20 hours after the injection.

75. Different types of insulin (short-, intermediate-, and long-acting) can be used together to keep a person's blood sugar level as near to normal as possible.

76. The most common concentration of insulin used in the United States is U-100.

77. People with diabetes who take insulin should know the type, dosage, concentration, and time pattern of the insulin they use.

78. People with diabetes should take their insulin injections at about the same time every day.

79. It is better to keep insulin bottles in the refrigerator and leave only the bottles currently being used at room temperature.

80. If extremes of temperature are avoided, insulin can be stored at room temperature for one year.

81. There are two types of syringes: low dose and high dose.

82. Syringes made of plastic are usually thrown away after one use, but they may be cleaned with alcohol and reused one or two more times.

83. Syringes should only be used by one person to avoid spreading diseases such as hepatitis B and AIDS.

84. Insulin injections are usually given in the abdomen, the hips, the back of the upper arms, the outer front of the thighs, and the outer part of the buttocks.

85. Insulin injections should be given into the layer of fat that lies beneath the skin.

86. It is important to rotate injection sites in order to avoid possible scars or the development of excess fat deposits.

87. Insulin injections should be given in one body region, such as the abdomen, until all of the area has been used, and then given in another body region.

88. The rate of insulin absorption may be affected by the area used for injection and whether or not that area is used in exercise.

89. To mix the insulin without creating air bubbles, the bottle should be gently rolled between the hands before use.

90. Both the top of the insulin bottle and the injection site should be wiped clean with alcohol before each injection.

91. It is important to inject as much air into the insulin bottle as the amount of insulin to be withdrawn.

92. Any air bubbles that appear in the syringe should be pushed back into the bottle before the injection is given because air bubbles cause the insulin dose to be smaller than it should be.

93. An individual's response to insulin is checked by blood sugar testing.

94. Diet, exercise, infection, illness, other medications, and stress can change the amount of insulin needed.

95. After receiving individualized instruction from their physician, people with diabetes can change the amount of insulin they take depending on their needs for that day.

96. There is not one ideal or standard amount of insulin for all people with diabetes because each person has a different need for insulin.

Diabetes Pills/Oral Hypoglycemics

97. People with type II (non-insulin-dependent) diabetes may need to take pills called oral hypoglycemics to help control the disease.

98. Diabetes pills are used in addition to, not in place of, a program of diet and exercise.

99. Although diabetes pills are not insulin, they lower blood sugar levels in a way similar to insulin.

100. Although rare, side effects of diabetes pills include skin rashes, loss of appetite, and nausea.

101. People who take diabetes pills should know the name, dosage, and time pattern of the pills they take.

102. Diabetes pills can react with alcohol and other medications.

103. People who take diabetes pills should check with their health care provider before taking other medications.

104. Because the combination of alcohol and diabetes pills can cause nausea and vomiting, people who take diabetes pills should check with their health care provider before drinking.

Diet

105. Most food will raise blood sugar levels.

106. Foods contain three nutrients that supply energy: carbohydrates, proteins, and fats.

107. It is important to read food labels to find out what nutrients the food contains.

108. A healthy balanced diet for many people with diabetes includes 50-60% of total calories from carbohydrates, 12% from proteins, and no more than 30% from fats.

109. The word "dietetic" on food labels means that something in the food has been changed or replaced and does not mean that the amount of calories or carbohydrates has been reduced.

110. There is currently no definition for the word "light" on food labels, except on meat and poultry products.

111. A doctor or dietician develops a meal plan that is individually designed for each person with diabetes.

112. A healthy diet for people with diabetes helps keep blood sugar at a near-normal level, helps achieve and maintain a desirable weight, and provides the necessary nutrients for good health.

113. The diet for people with diabetes is basically the same as a well-balanced meal plan recommended for most people.

114. People with diabetes should make healthy food choices, which include eating more foods that contain fiber and eating less foods that have a lot of fat (particularly animal fat) and salt.

115. People with diabetes should avoid foods that contain large amounts of sugar or simple carbohydrates, such as candy, cookies, pie, cake, jam, jelly, syrup, honey, fruit, fruit juice and soft drinks.

116. Fruits and fruit juices contain simple carbohydrates and raise blood sugar levels.

117. People with diabetes may be able to drink alcoholic beverages if their diabetes is in good control and they check with their health care provider first.

118. Alcoholic beverages such as beer, liqueurs, sweet wines, and drinks made from sweet mixers should be avoided because they can raise blood sugar levels.

119. People taking insulin who can drink alcoholic beverages should only do so with meals.

120. People with diabetes who take any medication should check with their health care provider before drinking alcoholic beverages.

121. People with diabetes should talk to their doctor or dietician before holidays and special occasions about ways to make adjustments in diet and/or insulin.

122. The diabetic exchange meal plan groups foods into six lists: starch/bread, meat and substitutes, vegetable, fruit, milk, and fat.

123. Each exchange list contains foods that have about the same amount of carbohydrate, protein, fat, and calories.

124. The diabetic exchange meal plan allows people to eat a variety of foods while keeping carbohydrates, proteins, fats, and calories fairly constant.

125. Free foods on the diabetic exchange meal plan are foods and drinks that contain 20 calories or less per serving.

126. People with diabetes should schedule their meals and snacks so that calories are spread as evenly as possible throughout the day.

127. People with diabetes should try to eat their meals at about the same time each day.

128. People with diabetes should try to eat about the same type and amount of food each day.

129. Occasionally missing or delaying a meal probably will not affect people with diabetes who don't take insulin, but it may be harmful to people with diabetes who do take insulin.

130. People with diabetes who take insulin should talk to their health care provider if they want to lose weight because their insulin dosages may change.

131. Working with a health care provider, people with diabetes who take insulin can lose weight by exercising more and/or eating less and adjusting insulin dosages accordingly.

132. For people with type II diabetes, changing their diet is an important part of the management program and, for some, may be the only change needed to control the disease.

133. Most people with type II diabetes are overweight and should lose weight by lowering the total number of calories they consume.

134. An effective way for people with type II diabetes to lose weight is to eat a healthy diet that leads to slow, steady weight loss.

135. Weight loss helps blood sugar levels return toward normal in people with type II diabetes.

Exercise

136. Exercise usually lowers blood sugar levels.

137. Exercise can increase blood sugar levels if diabetes is not well managed and blood sugar levels are already high.

138. People with diabetes should be alert to the signs of hypoglycemia during and after exercise.

139. People with diabetes who take insulin should test their blood sugar levels before unusually heavy exercise.

140. When exercising, people with diabetes should carry some form of sugar and wear medical identification stating that they have diabetes.

141. Regular exercise may help the person with type II diabetes lose weight.

142. People who have not exercised should check with their health care provider first and begin their exercise program gradually.

143. Aerobic exercise makes a person breathe hard and the heart beat fast.

144. An aerobic exercise program should include three or four 20- to 30-minute sessions per week.

145. Regular aerobic exercise helps to strengthen the heart and improve general fitness.

146. With proper planning, people with diabetes can do almost any kind of physical activity or sport.

THE COMPLICATIONS OF DIABETES
(Adult/Adolescent/Parent Measure)

THE PROBLEMS OF DIABETES
(Preadolescent Measure)

PREGNANCY AND DIABETES
(Women/Adolescent Girls Measure)

General

1. Diabetes and its complications are the third leading cause of death by disease in the United States.
2. Because of improvements in treatment, people with diabetes can live longer, healthier lives.
3. Some complications of diabetes are preventable, whereas others are not.
4. Good health care and near-normal blood sugar levels may delay or lessen the severity of diabetes complications.

The Eyes

5. Diabetes is a major cause of blindness in the United States.
6. People with diabetes may develop several different types of eye disease (retinal eye disease, cataracts, and glaucoma) that can lead to visual impairment and blindness.
7. The development of eye disease in people with diabetes may be delayed by careful control of blood sugar levels.
8. People with diabetes should keep their blood pressure in the normal range because high blood pressure may worsen eye disease.
9. Blurred vision in people with diabetes is usually temporary and not a sign of permanent eye damage.
10. People with diabetes should report any changes in their vision, such as blurring, to their health care provider.
11. Because the early stages of eye disease do not cause visual changes, people with diabetes should visit their ophthalmologist (eye doctor) regularly.
12. People with diabetes should have their eyes checked by an ophthalmologist at least once every year.
13. Laser therapy may prevent blindness in people with moderate to serious eye disease.
14. There are services available to assist people who have serious eye disease.

The Feet

15. People with diabetes may have problems with their feet caused by poor blood circulation, reduced pain sensation, and increased chance of infection.

16. Because pain sensation and circulation are often reduced, people with diabetes may not notice foot infections or injuries.
17. Common foot problems that can lead to serious complications in people with diabetes include corns, calluses, ingrown toenails, athlete's foot, pressure ulcers, and bacterial infections.
18. Undiscovered or untreated foot problems in people with diabetes can lead to gangrene or tissue death.
19. If foot problems in people with diabetes become severe, amputation may be necessary.
20. People with diabetes should check their feet daily, using a mirror, for signs of irritation, infection, or injury.
21. People with diabetes should wash their feet daily with mild soap in warm, not hot, water.
22. It is important to test the temperature of the water before bathing.
23. The temperature of bath water should never be tested with the foot.
24. After bathing, the feet should be dried, especially between the toes, and lotion or powder applied.
25. The toenails should be cut straight across and filed to remove rough edges.
26. People with diabetes should not use chemicals on their feet.
27. If their feet are cold at night, people with diabetes should wear socks and not apply hot water bottles or heating pads.
28. People with diabetes should not walk barefoot, particularly on hot surfaces such as sandy beaches and the area around swimming pools.
29. People with diabetes should wear clean socks and properly fitted, soft shoes with good soles.
30. New shoes should only be worn for short periods of time.
31. It is important to check the inside of shoes for objects, torn lining, etc. that may injure the feet.
32. Any foot irritation, infection, or injury should be reported immediately to a health care provider to prevent the development of complications.
33. People with diabetes should see their health care provider regularly and make sure their feet are checked at each visit.

The Kidneys and Urinary Tract

34. Some people with diabetes will develop kidney problems.
35. People who develop diabetes when they are young are more likely to have kidney problems than people who develop diabetes when they are older.
36. People can lose up to 90 percent of their kidney function without noticing any symptoms.

37. Kidney and urinary tract problems in people with diabetes may be reduced by careful control of blood sugar levels.
38. People with diabetes should keep their blood pressure in the normal range because high blood pressure increases the chance of kidney problems.
39. A health care provider can check for kidney damage by running laboratory urine and blood tests.
40. People with diabetes who have severe kidney problems may need a kidney transplant or kidney dialysis.
41. People with diabetes often get infections of the urinary tract.
42. The symptoms of urinary tract infections include a burning sensation when urinating and the urge to urinate often.
43. People with diabetes should see a health care provider immediately if they feel the symptoms of a urinary tract infection.
44. Proper treatment of a urinary tract infection is important so that the infection does not cause damage to the kidneys.

Diabetic Ketoacidosis

45. If blood sugar levels increase because of a lack of effective insulin, high levels of acids can accumulate in the blood.
46. High levels of acids in the blood lead to diabetic ketoacidosis (diabetic coma).
47. Factors that are associated with diabetic ketoacidosis are illness, infection, stress, and/or dehydration.
48. Poor diabetes management can lead to diabetic ketoacidosis.
49. Diabetic ketoacidosis usually develops over several days, but it may develop rapidly in young people with diabetes.
50. The beginning of diabetic ketoacidosis can be detected by frequently testing blood sugar levels and urine ketone levels.
51. The symptoms of diabetic ketoacidosis include tiredness, headache, increased thirst and urination, blurred vision, and rapid breathing.
52. People with the symptoms of diabetic ketoacidosis should call their doctor immediately.
53. Diabetic ketoacidosis is most likely to occur in people with type I diabetes, but it may occur in people with type II diabetes who are sick with another illness.

Hyperosmolar Coma

54. In older patients with type II diabetes, high blood sugar can lead to a serious condition called hyperosmolar coma.
55. Symptoms that indicate that blood sugar levels are going up include extreme thirst and frequent urination.

56. The beginning of hyperosmolar coma can be detected by frequently testing sugar levels.
57. In hyperosmolar coma, few or no ketones are present in the urine.
58. Factors that are associated with hyperosmolar coma are illness, infection, stress, and/or dehydration.
59. A health care provider should be called immediately if a person is experiencing the symptoms of hyperosmolar coma.

Sick Day Rules

60. People with diabetes who are sick with another illness can have high blood sugar levels even if they are not eating as much as usual.
61. People with diabetes who are sick still need to take their medication (insulin or oral hypoglycemics).
62. Testing blood sugar and urine ketone levels should be done more often than usual when a person with diabetes is sick.
63. People with diabetes who are sick should call their health care provider often and keep track of their temperature, fluid intake, and blood sugar and urine ketone levels.
64. If possible, people with diabetes who are sick should drink plenty of fluids.
65. People with diabetes who are sick should eat carbohydrates such as gelatin, soups, and soft cereals if they are unable to follow their usual meal plan.
66. People with diabetes should call their health care provider immediately if they are vomiting, are unable to eat or drink, or have ketones in their urine.

The Cardiovascular System

67. People who have diabetes are twice as likely to have heart disease than are people who don't have diabetes.
68. The most common type of heart disease among people with diabetes is arteriosclerosis (hardening of the arteries).
69. Arteriosclerosis is more common and develops at an earlier age in people who have diabetes than in people who do not.
70. The arteries most affected by arteriosclerosis are those that supply blood to the heart, brain, and legs, resulting in heart attacks, stroke, and loss of circulation in the legs.
71. Factors that are associated with the development of arteriosclerosis include diabetes, cigarette smoking, high blood pressure, high blood fat levels, obesity, and physical inactivity.
72. People with diabetes may be able to reduce their chance of developing arteriosclerosis by avoiding the other factors associated with its development, such as not smoking cigarettes, controlling high blood pressure, controlling blood cholesterol levels, maintaining ideal weight, and exercising.

73. People who have diabetes are more likely to have high blood pressure than are people who don't have diabetes.
74. People can have high blood pressure without any noticeable symptoms.
75. Continued high blood pressure is serious and can result in damage to the heart and other organs of the body.
76. People with diabetes should have their blood pressure checked regularly.
77. High blood pressure may be prevented by following a low-sodium diet.
78. High blood pressure can be treated with medication and a low-sodium diet.
79. Blood cholesterol levels may be reduced by eating fewer animal foods and more plant foods and lowering the total number of calories eaten.
80. Regular exercise is important for people with diabetes because it improves blood circulation, strengthens the heart, and helps in weight loss.

The Nervous System

81. People with diabetes can develop disorders of the nervous system (neuropathies).
82. Neuropathy is one of the most common complications of diabetes.
83. It may be possible to prevent some neuropathies by carefully controlling blood sugar levels.
84. Neuropathies can be mild or painful, and temporary or permanent.
85. Neuropathy can occur in different groups of nerves.
86. The nerves that control movement and feeling in the legs, feet, and arms can be damaged, causing many different symptoms, including loss of sensation, coldness, tingling, and pain.
87. The most common symptom of neuropathy in the legs, feet, and arms is loss of sensation.
88. The nerves that control body functions can be damaged, causing dizziness upon standing, diarrhea, inability to control urination, and sexual disorders such as impotence.
89. People with diabetes should report any symptoms of neuropathy to their health care provider.
90. Medication and other treatments may help relieve some of the problems associated with neuropathy.

The Skin

91. People with diabetes frequently have skin problems related directly to diabetes.
92. A common skin problem of people with diabetes is very dry skin.
93. People with diabetes often experience a skin problem that causes the surface of the skin to have a discolored and dimpled appearance.

94. Skin infections, cuts, and bruises take longer to heal in people who have diabetes than in people who do not.
95. Proper daily skin care for people with diabetes includes washing the skin with warm water and mild soap, drying the skin thoroughly, and applying lotion or powder.
96. If skin problems are not identified and treated by a health care provider, they may lead to more serious health problems.

The Teeth

97. Diseases of the mouth, especially of the gums, are more common in people who have diabetes than in people who do not.
98. Careful control of blood sugar levels can help prevent diseases of the mouth.
99. People with diabetes should practice good dental hygiene, including brushing and flossing the teeth and visiting the dentist regularly.
100. Problems such as bleeding gums and toothaches should be reported to the dentist.

Gestational Diabetes

101. Pregnant women can develop a type of diabetes called gestational diabetes.
102. Pregnant women who are at risk of developing gestational diabetes tend to be overweight, have a family history of diabetes, and/or have a previous personal history of gestational diabetes.
103. All pregnant women should be screened for gestational diabetes between the 24th and 28th week of pregnancy.
104. Gestational diabetes may go away after the baby is born or may continue and be reclassified as another type of diabetes.
105. About half of the women who develop gestational diabetes will eventually develop another type of diabetes.
106. Gestational diabetes generally develops during the second half of pregnancy.
107. Babies born to women with gestational diabetes may have high birth weights and, therefore, need to be delivered by Caesarean-section.
108. Gestational diabetes requires careful management to keep the mother and developing baby healthy.
109. To keep blood sugar levels as near to normal as possible, women with gestational diabetes should eat carefully balanced meals at regularly scheduled times.
110. Women with gestational diabetes may need to take insulin injections.

Pregnancy in Diabetes

111. If she has kept her blood sugar levels as near to normal as possible, a woman with diabetes is as fertile as a woman without diabetes.

112. If a woman manages her diabetes well throughout pregnancy, the survival rate of her baby will be almost the same as for a woman without diabetes.

113. It is important that women with diabetes who are considering pregnancy discuss their intentions with their health care providers and carefully plan their pregnancies.

114. A woman with diabetes should work closely with the health care providers involved in her pregnancy.

115. Most women with diabetes will go through their pregnancy without any difficulty, but specialized care is still recommended to reduce risks.

116. Good diabetes management before pregnancy can help in the maintenance of desired blood sugar levels during pregnancy.

117. Keeping blood sugar levels as near to normal as possible before and during pregnancy is important for the health of both the baby and the mother.

118. The major risks for babies born to women with diabetes include birth defects (damage to the internal organs or limbs), premature births, temporary difficulty breathing and feeding, larger than average size, and jaundice.

119. If diabetes has been carefully managed before and during the early months of pregnancy, the risk of birth defects may be reduced.

120. How well a woman has managed her diabetes and whether she has developed complications are more important to the success of her pregnancy than her age or the number of years she's had diabetes.

121. The major risks for a woman with diabetes who becomes pregnant are related to the condition of the woman's kidneys and eyes before pregnancy.

122. Kidney problems may temporarily become worse during pregnancy.

123. Edema (swelling) and high blood pressure can cause problems during the last months of pregnancy in women who have kidney problems in addition to their diabetes.

124. Eye problems which are not severe may temporarily become worse during pregnancy.

125. Severe eye problems can become worse during pregnancy and cause permanent damage.

126. A woman who has severe eye problems should discuss the possible consequences of pregnancy with her health care provider before becoming pregnant.

127. A pregnant woman with diabetes should have her kidneys and eyes checked regularly.

128. A person with type I diabetes has about a 2-6% chance of having a child with type I diabetes.

129. A person with type II diabetes has about a 10-15% chance of having a child who will develop type II diabetes as an adult.

130. It is important for a woman with diabetes who is pregnant to check her blood sugar levels, urine ketones, and blood pressure as directed by her health care provider.

131. As her pregnancy progresses, a woman with diabetes may need to change the number times a day that she tests her sugar levels.

132. Because a woman's metabolism increases during pregnancy, ketoacidosis can occur more quickly than usual.

133. It is important to avoid ketoacidosis at all times, but especially during pregnancy.

134. It is common for a pregnant woman's insulin needs to double or triple by the end of pregnancy.

135. Diabetes pills are not recommended during pregnancy because they may not be safe for the developing baby.

136. Pregnant women who have diabetes should follow a carefully balanced meal plan to ensure proper nutrition and near-normal blood sugar levels.

137. A pregnant woman with diabetes should talk to her health care providers about the best meal plan for her.

138. Women with diabetes who are pregnant should not lose weight.

139. To keep blood sugar levels fairly constant, women with diabetes may need to eat several snacks throughout the day and evening.

140. Many women with diabetes will be hospitalized for a week or so before they deliver to ensure that no stress is put on the baby and blood sugar levels of the mother remain as near to normal as possible.

141. Tests that monitor the condition of the baby have increased the number of women who are able to carry their babies to term and have vaginal rather than Caesarean deliveries.

142. If her diabetes has been carefully managed, it is safe and healthy for a woman with diabetes to breast-feed her baby.

Appendix B

INFORMED CONSENT PROCEDURES

Prior to administering measures to participants, program personnel should inform participants about the content covered by the measures and the purpose of the program's evaluation study. Program personnel may also wish to provide the opportunity for participants to indicate whether or not they consent to participate in the study and complete the selected measures. Informed consent is obtained by presenting all information pertinent to the study and asking the participant to affix a signature indicating that the information has been read and that consent is given to participate.

If the decision is made to obtain informed consent, program personnel have the choice of employing a "passive" consent procedure or an "active" consent procedure. *Passive informed consent* consists of asking participants to sign and return a consent form only *if they do not wish to participate* in the study. Participants who do not return the consent form are considered eligible to participate in the study.

Active informed consent requires participants to sign and return the consent form *if they wish to participate*. Only those participants who return a signed form can be included in the study. Consequently, the participation rate resulting from an active consent procedure is generally lower than that obtained from a passive consent procedure.

To construct an informed consent form, program personnel should consider including the following items:

1. A general statement of the program goals and objectives.
2. A brief explanation of the study procedures and measures.
3. An indication that the participant is free to withdraw consent and to discontinue participation at any time.
4. An explanation of the procedures to be taken to ensure anonymity and confidentiality of responses.
5. An indication that participants are free not to answer specific items or questions.
6. A place for the participants to affix their signatures under a statement indicating that the participant agrees to participate (active consent) or does not agree to participate (passive consent) in the study. If appropriate, a date for the return of the consent form should be specified.

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Appendix C

ANNOTATED EVALUATION BIBLIOGRAPHY

1. Alkin, M.C., & Solmon, L.C. (Eds.). (1983). *The costs of evaluation*. Beverly Hills, CA: Sage.

   In this collection of essays both theoretical and practical issues relevant to cost-focused program evaluations are presented.

2. American Psychological Association. (1973). *Ethical principles in the conduct of research with human participants*. Washington, DC: Author.

   This treatise focuses on the appropriateness of carrying out various types of research investigations with human subjects. Because the American Psychological Association has had a long-standing concern about ethical issues in the conduct of research investigations, this publication will be of interest to numerous evaluators of health education programs.

3. American Psychological Association, American Educational Research Association, National Council on Measurement in Education. (1985). *Standards for educational and psychological tests*. Washington, DC: Author.

   This volume presents the most widely used set of standards for psychological and educational tests. Frequently cited by users of educational tests, the standards have recently been employed in numerous judicial deliberations. Relatively brief, the standards should be consulted by health educators who employ assessment devices regularly.

4. Anderson, L.W. (1981). *Assessing affective characteristics in the schools*. Boston: Allyn and Bacon.

   Anderson provides an excellent set of practical suggestions for the creation of affective assessment instruments. He includes one of the most easily understood expositions of various scaling procedures including Likert, Thurstone, and Guttman scales.

5. Bausell, R.B. (Ed.). *Evaluation and the health professions*. Newbury Park, CA: Sage.

   This quarterly publication deals with a variety of evaluation-relevant issues of interest to health educators.

6. Berk, R.A. (Ed.). (1982). *Handbook of methods for detecting test bias*. Baltimore: The Johns Hopkins University Press.

   This collection of individual essays offers the reader a comprehensive depiction of methods currently available to detect the presence of bias in tests.

7. Berk, R.A. (Ed.) (1984). *A guide to criterion-referenced test construction*. Baltimore: The Johns Hopkins University Press.

This collection of essays consists of papers presented at the first Johns Hopkins University National Symposium on Educational Research. In addition, a number of more recently written chapters have been included in this revision of a 1980 text. The authors address many of the important problems, both conceptual and technical, facing developers and users of criterion-referenced measures.

8. Campbell, D.T., & Stanley, J.C. (1966). *Experimental and quasi-experimental designs for research*. Chicago: Rand McNally.

This volume, originally a chapter in a larger volume, has had substantial impact on the fields of research and evaluation. Evaluators of health education programs will wish to consider this truly classic treatment of data-gathering designs suitable for experimental and quasi-experimental settings.

9. Churchill, G.A., Jr. (1979). *Marketing research: Methodological foundations* (2nd ed.). Hinsdale, IL: The Dryden Press.

Although written in the context of marketing research, this textbook covers several topics of vital importance in evaluation. Topics such as research design, data collection, sampling, and data analysis are covered in a readily understandable yet accurate way. An excellent resource.

10. Cohen, J. (1977). *Statistical power analysis for the behavioral sciences* (rev. ed.). New York: Academic Press.

Cohen offers a useful treatment of factors which should be considered when one draws samples for use in research or evaluation activities. Of special interest is the set of easy-to-use guidelines he offers for determining the estimated sample size necessary to detect differences between groups.

11. Cook, T.D., & Campbell, D.T. (1976). The design and conduct of quasi-experiments and true experiments in field settings. In M.D. Dunnette (Ed.), *Handbook of industrial and organizational psychology*. Chicago: Rand McNally.

This is an updated version of the famous exposition of quasi-experimental and experimental data-gathering designs by Donald T. Campbell and Julian C. Stanley (see Reference No. 8). An excellent discussion of four types of validity is featured in this essay.

12. Cook, T.D., & Campbell, D.T. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Chicago: Rand McNally.

This widely cited volume provides a comprehensive treatment of quasi-experimental investigations in settings of substantial relevance to the concerns of health educators. There are excellent discussions of internal and external validity, including the various threats to both types of validity. A systematic consideration of the commonly used data-gathering designs is offered, including an extended appraisal of interrupted time-series designs.

13. Cordray, D.S., Bloom, H.S., & Light, R.J. (Eds.). (1987, Summer). *Evaluation practice in review* (New Directions for Program Evaluation, No. 34). San Francisco: Jossey-Bass.

This volume contains a set of thought-provoking chapters dealing with what has been learned about the practice of evaluation during the past decade. The chapters on evaluation politics by Eleanor Chelimsky and on naturalistic evaluation by Egon Guba would be of particular interest to evaluators of health education programs.

14. Cronbach, L.J. (963). Course improvement through evaluation. *Teachers College Record, 64*, 672-683.

This article is an early piece, presenting the virtues of what would later be termed "formative" evaluation. It rings as true today as it did more than two decades ago, and it applies as much to evaluation in health education as it does to more traditional evaluation. Emphasizing the role of evaluation in gathering information that can improve programs, this article is well worth reading.

15. Cronbach, L.J. (1977). *Analysis of covariance in nonrandomized experiments: Parameters affecting bias.* Unpublished occasional paper, Stanford Evaluation Consortium, Stanford University.

A highly technical piece on the complications associated with using analysis of covariance, this article is recommended only for those prepared to handle a critical data-analysis problem in a sophisticated way.

16. Cronbach, L.J., Ambron, S.R., Dornbusch, S.M., Hess, R.D., Hornik, R.C., Phillips, D.C., Walker, D.F., & Weiner, S.S. (1980). *Toward reform of program evaluation.* San Francisco: Jossey-Bass.

This important book considers the function of evaluation in a pluralistic society and presents 95 theses on the role of evaluators and evaluations. In addition to providing a contemporary conception of evaluation, it provides a historical and multidisciplinary perspective of the field. This volume will be of considerable interest to those evaluating health education programs.

17. Cronbach, L.J., & Furby, L. (1970). How should we measure 'change' – or should we? *Psychological Bulletin, 74*, 68-80.

A technical treatise on the dangers associated with using gain scores. A very significant piece, but recommended only for those with some psychometric training.

18. Cunningham, G.K. (1986). *Educational and psychological measurement.* New York: Macmillan.

This is a standard introductory text focusing on the major topics associated with measurement as it applies to such tasks as program evaluation.

19. Ebel, R.L. (1979). *Essentials of educational measurement* (3rd ed.). Englewood Cliffs, NJ: Prentice-Hall.

This is a standard, easily read introductory text, covering important topics in the field of educational testing. Ebel, a prominent leader of traditional educational testing practices, provides a lucid treatment of a wide range of measurement topics.

20. Fetterman, D.M., & Pitman, M.A. (Eds.). (1986). *Educational evaluation: Ethnography in theory, practice, and politics*. Beverly Hills, CA: Sage.

This collection of essays touches on ethnographically oriented evaluation of educational programs. Health educators wishing to learn about this recently emphasized approach to educational evaluation will find this volume of interest.

21. Green, L.W. (1979). Research methods translatable to the practice setting: From rigor to reality and back. In S.J. Cohen (Ed.), *New directions in patient compliance (pp.141-151). Lexington, MA: Lexington Books.*

Green attends to a practical dilemma facing those who evaluate health education programs, namely, the necessity to make trade-offs between validity and feasibility in field settings. Six strategies for coping with evaluation under adverse circumstances are described.

22. Green, L.W., & Figa-Talamanca, I. (1974). Suggested designs for evaluation of patient education programs. *Health Education Monographs, 2* (1), 54-71.

In this essay Green and Figa-Talamanca suggest data-gathering designs for conducting evaluations of patient education programs. The authors also explore several issues related to evaluations of this variety.

23. Green, L.W., & Lewis, F.M. (1986). *Measurement and evaluation in health education and health promotion.* Palo Alto, CA: Mayfield.

This volume is an excellent resource for health educators concerned with the evaluation of their programs. Green and Lewis provide a series of useful explanations of topics in both measurement and health evaluation. Their expositions are peppered with practical examples drawn from health education and health promotion.

24. Hambleton, R.K., Swaminathan, H., Algina, J., & Coulson, D.B. (1978). Criterion-referenced testing and measurement: A review of technical issues and development. *Review of Educational Research, 48* (1), 1-48.

This is a comprehensive review of the field of criterion-referenced testing. Hambleton and his colleagues do a masterful job of isolating the key issues in criterion-referenced testing and describing results of research investigations bearing on those issues. Somewhat technical at times, this review is one of the more widely cited essays dealing with criterion-referenced testing.

25. Hays, W.L. (1973). *Statistics for the social sciences*. New York: Holt, Rinehart, and Winston.

This comprehensive text handles basic and advanced statistical considerations. Somewhat technical at points, Hays nonetheless provides an excellent set of step by-step guidelines to statistical practice.

26. Joint Committee on Standards for Educational Evaluation. (1981). *Standards for evaluations of educational programs, projects, and materials*. New York: McGraw-Hill.

The development of these evaluation standards was spearheaded by a joint committee of the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education. Thirty standards are presented, addressing issues related to deciding whether to evaluate, defining the evaluation problem, designing the evaluation, budgeting for the evaluation, collecting and analyzing data, and reporting the evaluation. Intended for both consumers of evaluation and individuals conducting evaluations, this reference may be of most use to evaluators who are relatively new to the field.

27. Kubiszyn, T., & Borich, G. (1987). *Educational testing and measurement: Classroom application and practice* (2nd ed.). Glenview, IL: Scott-Foresman.

Another introductory text dealing with the nuts and bolts of measurement, this book will provide health educators with a good overview of educational measurement.

28. Levin, H.M. (1975). Cost-effectiveness analysis in evaluation research. In M. Guttentag & E.L. Struening (Eds.), *Handbook of evaluation research* (Vol. 2, pp. 89-122). Beverly Hills, CA: Sage.

This essay probes the important considerations involved in determining cost-effectiveness of programs in the context of educational evaluations. Theoretical as well as practical guidelines are provided.

29. Levin, H.M. (1983). *Cost-effectiveness: A primer* (New Perspectives in Evaluation, Vol. 4). Beverly Hills, CA: Sage.

This text is a splendid introduction to the fundamental concepts of cost analysis on program evaluation. Levin provides succinct descriptions along with advantages and disadvantages for cost-feasibility, cost-effectiveness, cost-benefit, and cost-utility analyses.

30. Linn, R.L., & Slinde, J.A. (1977). The determination of the significance of change between pre- and post- testing periods. *Review of Educational Research*, *47*, 121-150.

This article reviews many of the major issues in the measurement of change from pretesting to posttesting periods and suggests possible alternatives. These authors share the general sentiment of many others in the field that, "more is expected from gain scores than they can reasonably be expected to provide."

31. Lord, F.H. (1963). Elementary models for measuring change. In C.W. Harris (Ed.), *Problems in measuring change* (pp. 21-38). Madison: Wisconsin Press.

This is an early treatise on the problems associated with measuring change. Although this chapter rapidly becomes very technical, the early sections provide an intuitive explanation of the difficulties with using gain scores.

32. Mark, M.M., & Shotland, R.L. (Eds.). (1987, Fall). *Multiple methods in program evaluation* (New Directions for Program Evaluation, No. 35). San Francisco: Jossey-Bass.

Decrying the infrequency with which multiple methods are used in program evaluation, six chapters are offered in this volume, not only advocating multiple methods, but also describing how such program evaluations can be conducted.

33. Oakland, T. (Ed.). (1977). *Psychological and educational assessment of minority children.* New York: Brunner/Mazel.

This collection of essays provides a series of useful suggestions for those who are more sensitive to the possible bias present in educational tests.

34. Popham, W.J. (1981). *Modern educational measurement.* Englewood Cliffs, NJ: Prentice-Hall.

Varied topics in the field of educational measurement are introduced in this text. Norm-referenced measurement and criterion-referenced measurement are both considered, with the special applications of criterion-referenced assessment emphasized. Chapters on the relationship of testing to teaching and the measurement of affect will be of special interest to health educators.

35. Popham, W.J. (1988). *Educational evaluation.* Englewood Cliffs, NJ: Prentice-Hall.

This is an introductory text, written in fairly non-technical language, about the field of educational evaluation. Evaluators of health education programs will find it simple to translate the book's contents to their own specialties.

36. Popham, W.J., & Sirotnik, K.A. (1973). *Educational statistics: Use and interpretation* (2nd ed.). New York: Harper and Row.

This easily read introductory text deals with the fundamental types of statistical considerations needed by program evaluators. It is intended for those who are not particularly comfortable with mathematical approaches to statistics.

37. Riecken, H.W., & Boruch, R.F. (1971). *Social experimentation: A method for planning and evaluating social intervention.* New York: Academic Press.

This is a significant contribution to our thinking about large-scale social interventions, their design and appraisal. It provides a useful analysis of the ways that the experimental method can be defensibly employed in connection with major social programs.

38. Rivlin, A.M., & Timpane, P.M. (Eds.). (1975). *Ethical and legal issues in social experimentation.* Washington, DC: Brookings Institution.

Rivlin and Timpane explore the sorts of legal and ethical issues to which evaluators of health education programs must attend.

39. *SPSS-X User's Guide* (3rd ed.). (1988). Chicago: SPSS Inc.

This is a widely used, well organized set of "canned" computer analysis programs for use in the social sciences. Health educators who have occasion to use computer analyses will find the SPSS manual most helpful.

40. Salvia, J., & Ysseldyke, J.E. (1981). *Assessment in special and remedial education* (2nd ed.). Boston: Houghton Mifflin.

This text, intended for individuals who must apply assessment to special education and remedial education, provides measurement insights for health educators who deal with such populations of learners.

41. Scriven, M. (1967). The methodology of evaluation. In R.W. Tyler, R.M. Gagné, & M. Scriven (Eds.), *Perspectives of curriculum evaluation* (pp. 39-83). Chicago: Rand McNally.

This seminal article was the first essay in which Scriven distinguished between the now commonly accepted formative and summative roles of evaluators. Scriven ranges over a wide variety of topics, emphasizing the importance of comparative appraisals of two or more programs' merits.

42. Scriven, M. (1972). Prose and cons about goal-free evaluation. *Evaluation Comment, 3*, 1-4.

In this essay Scriven offers goal-free evaluation as an antidote to excessive preoccupation with the program staff's expressed objectives. Scriven argues that evaluators should attend to the results produced by a program, not the rhetoric of its program goals.

43. Siegel, S. (1956). *Nonparametric statistics for the behavioral sciences.* New York: McGraw-Hill.

This is the classic treatment of nonparametric statistical techniques. Although a bit out of date these days, Siegel's text offers the most easily understood treatment of nonparametric statistical procedures. Because of the author's admitted zealousness in support of nonparametric techniques, those using Siegel's text should also consult a critique of it by Robert Savage, *Journal of American Statistical Association*, 1957, *52*, 331-344.

44. Suchman, E.A. (1967). *Evaluative research: Principles and practice in public service and social action programs.* New York: Russell Sage Foundation.

In this volume, Suchman provides extensive coverage of the application of the experimental research model in conducting evaluations. Although evaluation has come a long way since this book was written, the volume provides a clear description of the predominant conceptualization of evaluation in the past decade.

45. Tukey, J.W. (1977). *Exploratory data analyses.* Reading, MA: Addison-Wesley.

Creative approaches to displaying and understanding data are provided by Tukey in this excellent demystification of data analysis.

46. Walberg, H.J., Postlethwaite, T.N., Creemers, B.P.M., & de Court, E. (Eds.). (1987). Educational evaluation: The state of the field. *International Journal of Educational Research, 11* (1).

This special issue, as its title suggests, presents comprehensive review of field of program evaluation from authors based in the U.S. and abroad.

47. Webb, E.J., Campbell, D.T., Schwartz, R.D., Sechrest, L., & Grove, J.B. (1981). *Nonreactive measures in the social sciences* (2nd ed.). Dallas: Houghton Mifflin.

This charming volume provides readers with a series of powerful and clever tactics to secure data, particularly of an affective nature, without sensitizing respondents to the evaluator's purposes.

48. Weiss, C.H. (1972). *Evaluation research: Methods of assessing program effectiveness.* Englewood Cliffs, NJ: Prentice-Hall.

Weiss offers a pithy overview of prominent program evaluation considerations including the formulation of questions to be addressed, the design of the evaluation study, and the utilization of evaluation results. A paperback, this brief book (160 pp.) offers an excellent introduction to what Weiss refers to as "evaluation research."

49. Windsor, R.A., Baranowski, T., Clark, N., & Cutter, G. (1984). *Evaluation of health promotion and education programs.* Palo Alto, CA: Mayfield.

This text is a useful introduction to the evaluation of health education programs. Windsor et al. have provided readers with a series of health-relevant examples to illustrate their explorations.

50. Worthen, B.R., & Sanders, J.R. (Eds.). (1973). *Educational evaluation: Theory and practice.* Worthington, OH: C.A. Jones.

This volume was one of the earliest compilations of various program evaluation models applied to education. Evaluation theorists whose views are presented in this book include Stake, Cronbach, Scriven, Tyler and others. Worthen and Sanders have authored sections of the book and have included a series of original chapters by a number of evaluation specialists. While focused on educational evaluation in general, the volume is of substantial relevance to program evaluation of health education programs.

51. Worthen, B.R., & Sanders, J.R. (1987). *Educational evaluation: Alternative approaches and practical guidelines.* New York: Longman.

This introductory text is organized around a series of alternative approaches to educational evaluation, including the "objectives-oriented" and "advisory-oriented" approaches.

52. Worthen, B.R., & White, K.R. (1987). *Evaluating educational and social programs: Guidelines for proposal review, onsite evaluation, evaluation contracts, and technical assistance.* Boston: Kluwer-Nijhoff.

This volume provides a first-rate series of practical guidelines dealing with varied aspects of proposal review, onsite evaluation, evaluation contracts, and technical assistance.

53. Zdep, S.M., & Rhodes, I.N. (1977). Making the randomized response technique work. *The Public Opinion Quarterly, 40,* 531-537.

This easily read essay describes the randomized response technique, a procedure used to obtain sensitive information from respondents more accurately than if respondents were directly asked about sensitive information.