BIBLIOGRAPHY

PATIENT COMPLIANCE

A SURVEY OF REVIEWS (1979-1989)

C. van Campen & E.M. Sluijs

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CONTENTS

FOREWORD

Judging from the considerable amount of literature and research on this topic the problem of compliance and non-compliance remains a challenge for the medical profession and for social scientists.
Some good reasons for this continuing interest can be mentioned. The first of them, of course, is the health of the patient. Although much is still unknown about the extent to which a patient's compliance influences his actual health status, there are medical treatments that can only be effective if patients comply with prescriptions. Consequently, it is of great importance to discover factors that facilitate or hinder patient compliance. This knowledge may contribute to the efficacy of health care delivery, which is the ultimate goal of many researchers.
In addition to this practical relevance, the phenomenon of compliance is scientifically interesting: 'why is changing behavior in a direction beneficial to health so difficult?' Many social scientists consider it a challenge to discover explanations of patient behavior and, more generally, for 'why people do what they do'. Together, the practical and the scientific relevance of compliance ensures that research on this topic continues.
This continuing interest in compliance research is the reason why the Netherlands Institute of Primary Health Care (NIVEL) has made a survey of the literature on the topic in the form of a bibliography. As it is almost impossible to describe the thousands of research articles on the subject of compliance, it was decided to make a bibliography of review articles. In doing this we intend to provide the user with an general overview of compliance research in the last decade.
We consider it of great importance that people, involved in patient compliance have a knowledge of the range of research findings on this topic and hope they can benefit from the work already done. We also consider it a necessary prerequisite for investigators, first of all, to have an insight into the state of the art in this field. They can take advantage of the experience already built up in compliance research and this may contribute to the accumulation of knowledge. We hope this bibliography will be an effective guide to relevant literature and research.

Jozien Bensing
General Director of the
Netherlands Institute
of Primary Health Care

INTRODUCTION

This bibliography presents a survey of compliance research in the eighties. Since compliance research has thus far produced more than 4,000 articles, we chose to survey this field by summarizing reviews of compliance research. We covered the period between 1979 and 1989. We consider the bibliography of Haynes, Taylor & Sacket a good survey of compliance research before 1979.

Compliance research is not a well demarcated research field. We limited this bibliography to: 'patient compliance in individual medical treatment'. Specification of each word of this description will demarcate the subject more precisely.

Use of the term 'Patient' means that the research is restricted to people suffering from an illness.

The most often cited definition of 'compliance' by Haynes (1979) states: 'compliance is the extent to which a person's behavior (in terms of taking medication, following diets, or executing lifestyle changes) coincides with medical or health advice'. Besides compliance, the term 'adherence' is increasingly used. Compliance suggests that the patient confirms a request made by the physician, whereas adherence refers to the ability or willingness to follow a health-care plan (Dunbar 1980). Other more specific terms, the reader will encounter are: dropout, relapse, return-compliance, and therapeutic alliance.

The term 'individual' restricts the field to individual (one-to-one) contacts or health-care-settings. As a result, the 'health education' research field falls outside the scope of the bibliography in respect of public or group education programmes, and within its scope in respect of individual education. Consequently, only reviews devoting considerable attention to individual education are included. Several good bibliographies (Westendorp & Spruit 1987, Lorig & Riggs 1983) and reviews (Lorig, Konkel & Gonzalez 1987, Kleijnen & Visser 1989) cover (parts of) the extensive field of health education.

The term 'medical treatment' excludes the field of psychotherapy and psychiatric treatment. Exceptions are made for articles reviewing collaboration between physicians and psychologists (in for example self-management research).

Literature

A research of the literature in the databases of MEDLINE, PSYC (Psychological Abstracts) en SOCA (Sociological Abstracts) was carried out. The (key)words 'patient-compliance', 'adherence' and 'dropout' were linked with the (key)word 'review'. Further, the catalogs of the libraries at NIVEL, the Ministry of Health, and Utrecht University were consulted. The bibliography does not give an exhaustive treatment of the review literature on patient compliance. It was only possible to include literature in Dutch libraries.

Chapters

The literature is classified into seven chapters. The reviews in the first chapter consists of general surveys and introductions, and historical analyses of compliance research. The reviews in chapter two examine research theory and methodology. Chapter three considers factors related to or influencing compliance. Chapter four contains reviews on compliance in the chronically ill; including four general reviews, and specific reviews on the following diseases: (rheumatoid) arthritis, diabetes (mellitus), hypertension, heart disease, and renal disease. Chapters five and six examine compliance in the elderly and in children respectively. The last chapter contains reviews on compliance with lifestyle changes and physical exercise. Most chapters open with general reviews followed by specific reviews grouped together thematically. Reviews on compliance with specific treatments can be traced back via the subject index.

Abstracts

Most articles in this bibliography review empirical research literature. Some review theories or historical developments.

Mostly, the reviews contain four aspects: authors' purpose with reviewing the literature, the method or approach they followed, results and interpretation and, conclusion and recommendations. Accordingly we ordered most abstract along these four aspects.

First, the authors' aims or purposes are described and the theoretical or practical framework they used. In many reviews explicit theoretical notions are lacking but authors' implicit point of view is indicated by the ordering or classification they used.

The second part of each abstract describes the method the authors followed and the way they selected the literature. Some authors have used high methodological criteria in selecting their literature, while others did not, or did not describe their selection. If described, this selection is mentioned in the abstract.

The third part of the abstract describes the main results of the review. These results are presented according to the authors' classification or ordering. Needless to say that the abstract only gives an impression of the main results of a review; an abstract can not cover all relevant findings.
Each abstract ends with the fourth aspect, the authors' main conclusions and recommendations. In some abstracts the latter are lacking because some authors did not explicitly formulate conclusions or recommendations. We must emphasize the abstracts are closely connected to the text of the reviews. No interpretation or clarification was added. As a result, the terms used in each abstract may differ.

Instructions

The titles of the articles are in numerical order. The authors index and the subject index refers to these numbers. The description 'Nivel' (+ number) indicates the presence of the article or book in the Nivel library. Some reviews bearing the description 'ruu' are not available at the Nivel library, but can be found in the libraries of the University of Utrecht.

Literature

Dunbar, J. Adhering to medical advice, International Journal of Mental Health; 9, 1980, no. 1-2, p. 70-87.

Haynes, R.B., Taylor, D.W., Sackett, D.L. Compliance in Health Care. Baltimore etc.: John Hopkins University Press, 1979.

Kleijnen, J.G.V.M. & Visser, A. Ph. Effectiviteit van voorlichting aan patiënten met rheumatische aandoeningen: een literatuuroverzicht. Gedrag & Gezondheid; 17, 1989, no. 1, p. 18-27.

Lorig, K. Riggs, G. Arthritis patient Education Biblioprofile no.1. Bethesada: Arthritis Information Clearinghouse, 1983.

Lorig, K. Konkel, L., Gonzalez, V.
Arthritis patient education: a review of the literature. Patient Education & Counseling, 1987, 10, 207-252.

Westendorp, I.M., Spruit, B. Patiëntenvoorlichting: een geannoteerde bibliografie. Utrecht: GVO, 1987.

1. GENERAL

1

DiMATTEO, M.R., DiNICOLA, D.D.
Achieving Patient Compliance: the psychology of the medical practitioner's role.
New York: Pergamon Press, 1982, 335 p.
nivel (B 1135)
(R. Jonkers. Therapietrouw: samenvatting van Achieving Patient Compliance van M.R. DiMatteo en D.D. DiNicola. Bunnik: Landelijk Centrum GVO, 1984, 57 p.)

This well known book on patient compliance contains more then a review of research on patient compliance. It deals with many theoretical and empirical findings relevant in doctor patient communication and patient compliance.
The authors goal is to examine in depth the contributions and viewpoints of the social and behavioral sciences to the compliance problem. Their approach consist of first examining theoretical issues of each topic and second reviewing empirical evidence. The implications for medical practice and doctor-patient communication are thoroughly discussed.
The first chapters concern the problem of compliance and the practitioner-patient relationship. The following chapters are organised round aspects of the health belief model namely: patient's perceptions of illness and the influence of patient's culture, the influence of beliefs and attitudes on behavioral intentions, and the way behavioral intentions lead to behavior.
The problem of compliance. The authors mention the definitions of compliance, adherence, cooperation and related terms and discuss the kind of power relation each of these terms imply. The authors hold the view that irrespective of the term used, the ultimate goal in a therapeutic relationship is to attain initial cooperation and next internalization. Internalization means the patient acquires continued self-control over his behavior and has an internally motivated commitment to adhere to the treatment regimen.
The authors discuss the importance of practitioner's assessment of patient's compliance and the difficulties that are met in doing so. Practitioners seem to overestimate patient's compliance and they are

inaccurate in identifying patients who comply and who do not comply. The reasons of practitioner's unawareness are discussed in common with solutions to this problem.

Factors influencing non-compliance are intra-psychic factors, environmental factors and factors in the relationship and the communication between practitioner and patient. Besides there is a great deal of unintentional non-compliance stemming from unclear prescriptions. Intentional noncompliance may stem from patient's resistance to the advice (content) or from the poor quality of the therapeutic relationship (process). Overcoming non-compliance is discussed using the social-psychological theory of interpersonal influence and social power.

Communication of information. Research indicates there are a number of limitations in the communication between practitioner and patient. A surprising number of patients leave their doctor's office with little idea of what they are supposed to do to follow their treatment regimen. Physicians usually take little time to teach their patients and they seem to underestimate the comprehension level of many patients.

Non-compliance stems not solely from poor information. Patients forget much of what the doctor tells them (about one-thirds) or make interpretative errors. Instructions and advice are more likely to be forgotten than other information.

The authors discuss both practitioner and patient variables related to practitioner's 'failure' to explain and patient's 'failure' to comprehend. Most important are the barriers that hinder effective communication, for example: patient's anxiety or distress, patient's passive role in the communication, the disparity in power between doctor and patient, the different background and perspectives of doctor and patient, and, the context of medical care.

Enhancing effective communication, according to the authors, is needed. Many positive results of effective communication are reported. Patient's compliance appears to be related to communication and explanation by the physician. There is also clear evidence that information increases patient's satisfaction. In respect with the outcome of treatment positive results of informing patients are found in surgery or in stressful medical procedures.

Rapport and the art of medicine. Interpersonal factors in the therapeutic relationship that contribute to patient compliance are discussed. The social roles of doctor and patient are examined from a social psychological viewpoint. The authors discuss the meaning of

patient's expectations and requests, the process of negotiation in health care and patient's self-presentation. The importance of trust in the therapeutic relationship is emphasized.
Empirical findings indicate that at least five factors may influence the relationship and patient compliance: the practitioners affective communication, practitioner's sensitivity, practitioner's warmth and friendliness, reassurance and positive expectations and, practitioner's self-disclosure. The authors argue that these interpersonal skills are a necessary condition in health care.
Patient's perceptions of illness, prevention and treatment. It is argued that a clear understanding of the patient's perceptions of illness, prevention and treatment is needed in gaining insight into compliance and non-compliance. Patients' perceptions and beliefs influence their interpreting of symptoms, decision to seek care and patients' willingness to accept and comply with medical advice. Physicians seem partly to be unaware of those influences, they consider patient characteristics and 'uncooperative personality' as the primary cause of non-compliance. There are however no research findings in support of this view. The authors examine why physicians continue to stereotype patients as non-compliant and why patient's legitimate difficulties in following advice are overlooked.
The theory of 'reasoned action' (Ajzen and Fishbein) and the health belief model are used to examine how attitudes influence a patient's intentions to comply and his actual behavior.
Norms and compliance. Some general issues concerning the process of socialization and social influence are discussed. It is argued that beliefs must be combined with the individual's perception of his own social norms in order to predict and understand social behavior.
Social factors in health, illness and medical treatment are: the influence of the family, social class norms, and norms of the ethnic and cultural group. Sex and age norms were also supposed to influence health behavior. Research however has indicated there is no stable relationship between age or sex and compliance. The authors argue that social factors alone are insufficient to predict compliance. Both, beliefs and social-group normative factors must be considered. Together they can effectively predict health behavior and compliance.
Beliefs, attitudes and the formation of behavioral intentions. According to the theory of 'reasoned action' a joint operation of attitudes and social norms brings about behavioral intentions. This theory has received rather extensive empirical support, albeit

primarily in areas other than health behavior. Although the theory is primarily a predictive one, it provides a very useful framework, according to the authors, for bringing about changes in behavioral intentions.

To change behavioral intentions the provider can try to change patient's beliefs and attitudes. Persuasion seems to be an effective technique in this respect. Characteristics of effective persuasion are discussed. The health practitioner may also use other forms of social influence to change patient's beliefs and attitudes. The applications and limitations of those techniques are reviewed.

From intentions to behavior. According to the authors, health practitioners often consider their efforts successful when the patient is persuaded to change his or her beliefs, attitudes and subjective norms. Practitioners should recognize however that patients encounter difficulties and barriers when behavioral intentions are converted into actual (compliant) behavior. Some of the typical barriers are discussed. The methods practitioners might use to assess those barriers and the forms of assistance available to patients to overcome them are analyzed.

Barriers influencing non-compliance are: accessibility of medical care, costs of treatment, complexity of treatment regimen, the form in which medication is dispensed. Other barriers may lay in lack of social support from family or friends. There is empirical evidence that social support groups are successful as a strategy for enhancing compliance.

The authors point to the fact that social support seems to be a necessary but not a sufficient condition for behavior change and maintenance. They discuss the way behavioral and cognitive approaches can be used to facilitate and enhance patient compliance. Besides the influence of practitioner's attitudes and expectations are analyzed.

Concluding remarks. The authors discuss the implications of a social psychological approach to compliance and some ethical issues. In general, they conclude patients compliance with both short and long-term treatments is wholly inadequate. They consider a negotiating approach with shared knowledge and power as the most adequate. They strongly recommend clinical prescriptions should be based on a negotiated consideration of patient's beliefs, values, norms, resources, and constraints. The implications of a negotiating approach in clinical practice are discussed.

2

MASUR, F.T.

Adherence to health care regimens.

In: C.K. Prokop & L.A. Bradley (eds.) Medical Psychology: contributions to behavioral medicine. New York: Academic Press, 1981, p. 441-470.

nivel (C 2439)

This review adresses four issues with respect to compliance: the magnitude of noncompliance; definitions and measurement of compliance; various parameters affecting compliance; and various strategies to improve compliance.

Magnitude. According to the author, based on the study under review, the proportion of patients who fail to adhere to physicians' orders ranges from 15 to 94%. Summarizing various opinions, the author concludes that noncompliance is a problem which often results in an inefficient utilization of health care services and an unnecessary increase in health care expenditures.

Definition and measurement. According to the author, the operational definitions of compliance vary considerably across investigations. He examines various measures of medication compliance; such as provider prediction, patient self-report, medication measurements, clinical outcome, direct chemical analysis, and medication monitors. In his opinion: the predictions of compliance by health care providers are usually inadequate. Patients self-report and medication measurement overestimate frequently compliance. Frequent medication checks may have a reactive effect. Treatment outcome measures must be used with special caution in assessing compliance for many extraneous variables may have accounted for the patient's improved condition. Direct observation is an ideal but often impractical strategy, while medication monitors have gained some recognition as an adjunctive compliance assessment tool.

Factors. The author reviews the relevant factors that have been studied with the largest section being devoted to those psychosocial or sociobehavioral variables that are of particular importance to the medical psychologist. He discusses demographic characteristics, features of treatment regimen, side effects, duration of treatment, cost and psychosocial variables.

Demographic characteristics, when viewed in isolation, have, in his view, very little predictive value in understanding compliance. He suggests, however, that when demographic characteristics are combined with other parameters they may prove helpful in delineating

specific high risk patient profiles.

Reviewing the literature on treatment characteristics, he argues that: treatment regimens that require extensive alterations of the patient's lifestyle pose serious compliance problems. Further, the improvement of compliance by less frequent dosages of medication has yet to be established experimentally. Long-term treatments are generally associated with poorer compliance although this may be partially due to the asymptomatic nature of the prophylactic orientation of the regimen. Side effects may have little to do with compliance, whereas the relationship between cost of treatment and compliance remains open to investigation.

Reviewing literature on psychosocial variables, the author suggests that clinicians should emphasize the importance of instruction and advice, and should use language that is easy to understand. It would be helpful in determining whether the patient has clearly received the intended communication to have the patient briefly reiterate the provider's directives. Further, he concludes there is a fairly consistent finding that patients' stated degree of satisfaction with their interaction with health professionals correlates with subsequent compliance. He remarks that nearly all of the studies reviewed are correlational investigations, making it difficult to infer direct causality with any degree of confidence.

Educational studies suggest, according to the author, that patients' formal knowledge regarding their illnesses does not correlate with, predict, or guarantee improved compliance.

By employing response cost, response priming, contingency contracting, and more elaborate token economy systems the clinician might well be able to affect improvements in adherence. A more comprehensive approach to compliance including cognitive-behavioral concepts and self-management techniques needs to be developed.

The health belief model, according to the author, may be of heuristic value for a cognitive-behavioral approach to improving compliance. In its present form the model no longer incorporates a 'cues to action' dimension which, in his opinion, needs to be reincorporated. Although the model has been criticized for its retrospective analysis, at least one study has demonstrated its prospective utility.

In the section on improvement of compliance, the author discusses intervention techniques, including: patient education, regimen tailoring, and behavioral techniques. He reviews several ways of implementing these techniques.

Recommendations. The author concludes that the behavioral treatment of noncompliance is still in its infancy. He hopes that the recent 'rediscovery of thought' will provide a forum for the development of new and powerful compliance improving techniques. Similarly, educational strategies, he suggests, must move beyond simply providing the patient with formal knowledge. Research based upon an understanding of the factors involved in persuasion, social influence and social control must be directed at educational strategies to alter patients' values, expectancies, and belief systems. Finally, methodologically sound, empirically based research needs to be undertaken evaluating cost-efficient, practical intervention strategies.

3
DUNBAR, J.
Adhering to medical advice: a review.
International Journal of Mental Health; 9, 1980, no. 1-2, p. 70-87, 31 ref.
nivel (C 2440)

In this article, the author reviews definition, measurement, and determinants of adherence/compliance.

Two **definitional issues** are discussed: the terms compliance and adherence; and the specification of the behavior under study. The term compliance suggests, according to the author, that the physician makes a request of the patient. Adherence refers to the ability or willingness to follow a health-care plan. The author discusses three types of definition of adherence. The first type uses a ratio of behaviors carried out to the behaviors prescribed. The second is the category type, in which the patient is placed in a category of adherence, e.g., good, fair, poor, non-adherent. The third definition is an index of adherence. For example, a diabetic patient's adherence may include knowledge of the disease, ability to follow a diet, accuracy in administering insulin injections, and following food-care prescriptions.

Measurement. The author discusses: biological evaluations, pill count, self-monitoring, monitors, interviews, and clinician estimates. She expresses her views on the pro and cons of these methods. Biological assays measure only whether or not a drug has been taken in some period before the test was performed. An assess-

ment of taking medication over time cannot be obtained, nor can the quantity of the drug ingested be determined. The pill count is, according to the author, useful in a research setting, particularly for evaluating the outcome of intervention studies and for defining categories of adherence. The complexities involved in collecting the data tend to make it less useful in clinical practice. Self-monitoring, she argues, is relatively simple if the patient has been instructed on how to observe this behavior. The ease of self-monitoring and the richness of the data make this procedure suitable for clinical practice. It does, however, tend to be reactive, that is, to alter the behavior itself. Although this can be useful in practice, it can confound the dependent variable in research. Monitors can supplant the traditional pill count and provide data on taking medicines over time. Monitoring devices show promise, in her view, for the measurement of adherence in research. Their potential utility in clinical practice remains to be demonstrated, particularly in terms of cost-benefit factors. Although interviews tend to overestimate adherence, it does allow the patient's routine, problems, and errors in detail to be examined. Problem is that the patient has to rely on his memory. Moreover, the patient may overestimate his adherence, probably to present himself in a positive light. Health care providers tend to overestimate adherence. The outcome of therapy is dependent on various factors, adherence being only one of them. The author warns not to hasten to the conclusion that the outcome measure is a direct indicator of adherence: other assessments must be made.

Determinants. The author groups determinants of adherence in four groups: factors that have to do with (1) the patient, (2) the clinician, (3) the clinic or office environment, and (4) the regimen itself. Studies are cited, showing that remembering and understanding the clinician's advice are important patient-factors. Therefore the clinician should instruct the patient carefully. He can use stimulus control methods (cues, reminders) to help the patient remember what to do. The degree of social support may also influence adherence. She argues that methodological differences and difficulties and failures to define social support may account for the problems in clear interpretations of these studies. Patient attributes like motivation, she states, seem to have little connection with adherence. Similarly, age, race, sex, marital status, educational level, and intelligence are not associated with patient adherence. Certain clinician characteristics, such as empathy with

the patient seem important to the patient's adherence. An important clinical factor is waiting time. Further, if a patient is telephoned or sent a postcard as a reminder, appointment-keeping rates tend to be higher.

Conclusion. Of all factors critical to patient adherence, the author concludes, those associated with the regimen seem to be most critical. The risk of poor adherence is greater with life-style changes than with simple medication. A complex treatment regimen has been shown in several studies to raise the risk of poor adherence. Duration of the regimen seems to have a greater impact on adherence than for example side-effects. Continuing support seems to be important, along with simple techniques, self-attributed change, and preventing dependency on the provider, self-monitoring and social support.

According to the author, each of the foregoing factors and interventions is concerned primarily with prevention of adherence problems and the main tenets of good adherence. Little attention has been paid, over the last decade to the problem of improving adherence. Three studies showed that poor adherers can be retrieved, with significant effects on adherence and therapeutic outcome. According to the author, the strategies need to consist of more than attention and self-monitoring.

The author suggests clinicians to pay attention to a well-running clinic, offering sound instructions about regimen, and utilize prevention and remediation techniques.

4
GREENBERG, R.N.
Overview of patient compliance with medication dosing: a literature review.
Clinical Therapeutics; 6, 1984, no. 5, p. 592-599, 68 ref.
nivel (C 2427)

This paper reviews the literature from the perspective of a physician interested in improving patient compliance in a cost-effective and time-efficient manner. The purpose of the reviewer is to summarize the literature on patient compliance with dosing schedules and drug regimens to make objective statements.

From library computer searches and cited references, 57 articles were identified that examined patient compliance to medication

dosing. Thirty-six of the 57 studies limited data to compliance with one particular agent. Twenty-three studies evaluated compliance in patients receiving antibiotics, five studies evaluated patient compliance with antacid regimens, and the rest dealt with miscellaneous diseases. Twenty-four of the 57 studies evaluated compliance in the pediatric age group, 32 studies involved only adult populations, and one included both groups. Measurement and definition of compliance varied from study to study. Despite this divergence, the author examines the overall relationship between medication dosage and compliance.

Results. On basis of 26 studies, the author concludes that better compliance is seen with once-a-day and twice-a-day regimens than with either three-times-daily or four-times-daily regimens. Six studies evaluated physician ability to predict patient compliance. The predictions were correct in about two thirds of patients. Six studies suggested that compliance rates decrease with increasing the number of drugs a patient must take each day. Three studies suggested that patient compliance decreases over time. According to the author, neither patient's income, or education were found to correlate directly with compliance rates. And intense patient counseling have been found in some studies to improve compliance rates.

Recommendations. According to the author, the reviewed literature suggests that attempts to reduce dosage schedules to no more than twice-a-day will significantly improve compliance rates. Other factors found in the review are: shortening duration of therapy, reducing number of medication, offering intense counseling, and offering medication in specialized dose dispensers or calendar packs. Future research should evaluate these techniques to improve compliance in randomized trials. Measurement should be standardized. As more effective medications become available, the author argues, therapeutic effects could be utilized as means of measuring compliance. Finally, pharmaceutical companies should be encouraged to develop effective and safe drugs that can be administered less frequently.

5
STEEN, J.J. van der,
Terugkomtrouw in de huisartspraktijk
(Return-compliance in general practice), (including english summary).
Waddinxveen: Alphazet, 1987, 179 p.
nivel (B 1457)

In this dissertation, the motives of patients in returning for an appointment agreed with the general practitioner are investigated. In chapter two, the author reviews research into advice compliance and in particular appointment keeping. Most studies involved primary care situations. Definitions and determinants (in particular health beliefs, social support, physician-patient interaction, and demographic factors) of appointment keeping are discussed.

Definition. According to the author, terms like 'appointment-breaking', 'no-shows', 'broken appointments', and 'appointment failure' all refer to return-noncompliance. Several investigators remarked the lack of uniformity in definition of return-compliance.

Determinants. On basis of several studies, the author concludes that return-compliance is higher with easy treatable chronic diseases than with psychic complaints and asthmatic complaints. On basis of five studies, he concludes that personal reactions to complaints are better predictors of return-compliance than nature of the disease.

The author discusses the **health belief model**, which he regards as a variant of Boudons's utility-theory. The model predicts that the patient makes a rational choice on basis of a cost-benefit analysis. One study reported that among the four health belief model factors, 'perception of the severity of the disease' has the greatest (positive) impact on return-compliance. A second study showed that severity of the diseases is sometimes reasoned away by patients. A third study reported a low correlation between experience of health status and physical status. On basis of three studies, the author concludes that patients with more vague complaints show higher return-compliance.

The author argues that cultural beliefs have a great impact on health beliefs of the individual. Cultural beliefs can be in contradiction with medical beliefs of the care-provider. According to the author, it is the task of the care provider to support a rational choice of the patient between medical and cultural beliefs.

The author discusses possible barriers of return-compliance. Several studies reported that a polite, engaged, efficient approach during

consultation, and short waiting-time increased return-compliance. One study showed a negative relation between the distance practice-home and return-compliance; another study found no relation.

Social support. Social inconvenience, according to the author, can be a barrier too. Return-compliance can be improved by engaging members of the social network of the patient into the treatment. Social desirability is an important determinant of individual health beliefs. One investigation, engaging friends into a polio-vaccination program showed positive results. Some investigators stress the importance of information-giving to the social environment of the patient.

Physician-patient interaction. On basis of several studies, the author concludes that continuity of care by one care-provider improves return-compliance. Mutual participation and consultation improved return-compliance too, according to several investigators. Information-giving is an ambiguous determinant. Four studies reported a positive relation; one piece of literature research pointed out that this relation is not always consistent.

Demographic factors. Contradictory results exist on the relation between return-compliance and sex. Two studies found a positive relation, and seven studies no relation, with sex. On basis of eight studies, the author concludes that patients under 35 are less compliant in terms of appointments.

Cultural factors, such as education and profession, can explain compliance, according to several investigators.

Discussion. The author regards the health belief model as a realistic explanation model of health and sickness-role behavior. Beliefs and perceptions are influenced by the social network of the patient. He argues that influence of the care-provider on the social network is of first importance for return-compliance. He recommends to study the role of the family and return-compliance.

On basis of his (dissertation) research into appointment-keeping with general practitioners, the author concludes that Boudon's model can explain the return behaviour to some extent, but he regards the strength of the correlation as unconvincing.

6
WILSON, T.G.
Compliance: a review of the literature with possible applications to periodontics.
Journal of Periodontology; 58, 1987, no. 10, p. 706-714, 122 ref.
nivel (C 2429)

This paper reviews the literature of compliance in dentistry in general and periodontics in special. The articles reviewed deal with compliance with oral instructions regimens and compliance with maintenance schedules.

Magnitude. One study reported that after instruction in oral hygiene, less than half of the patients still used cleaning aids at the end of 3 years. In a second telephone-survey, one third of the patients said they were highly compliant, and another third said they were poor compliers. In a third study, using interviews, 51% of the patients given oral instructions were found 'highly compliant', and 11% 'noncompliant' 30 days after instruction.

Improving compliance. One study reported that positive feedback lowered plaque and bleeding scores compared with controls. Investigators in a second study stated that the keys to improved self-care included (1) successful patient-therapist communication, (2) having the desired skills demonstrated by the patient to the therapist and (3) reinforcing the idea that efficiency is more important than the amount of time spent cleaning. Referring to one study, the author remarks that educational programs alone will not improve compliance.

According to the author, compliance with suggested **maintenance schedules** for patients with periodontal diseases is important. In one study of approximately 1000 patients monitored for 8 years, it was found that 16% complied with suggested maintenance intervals and 34% never came back for maintenance. A second analytical study of university-based studies showed percentages of noncompliance ranging from 11% to 45%. In a third study, the investigators question the need for complete compliance. They found that the frequency of visits had no effect on the effect of 'bleeding upon probing'.

Determinants. One investigator has suggested that noncompliance may be indirect self-destructive behavior, characterized by denial and negligence in patients' attitudes towards their illness. A second determinant mentioned is fear. Several approaches have been suggested to diminish fear, including: relaxation and symbolic model-

ing, group education or video tapes, and the changing behavior of dentists towards patients. A third determinant is formed by economic problems. On basis of two studies, the author concludes that in lower socioeconomic classes, monetary rewards have been shown to improve compliance. In his view, the 'middle class' is more apt to be motivated by educational, exercise of practitioner authority, discussion and persuasion.

Discussion The author briefly discusses the influence of 'inception cohort' (to be representative all patients starting treatment should be followed to the completion of the study) and type of disease on research outcomes. Further, the author makes several suggestions, taken from medical literature, for improving dental compliance. Finally, he outlines an approach of patient's compliance with oral hygiene and/or maintenance by implementing different therapies for different levels of compliance.

7
COHEN, S.J.
New metaphors for old problems.
In: S.J. Cohen (ed.), New Directions in Patient Compliance.
Toronto: Lexington, 1979; p. 153-163, 14 ref.
nivel (C 2435)

The author states that the bibliography of the McMaster group (Sackett, Haynes a.o.), has shown that generalizability of findings across studies is more often the exception than the rule. He argues that the paucity of clear and consistent trends in patient-compliance cannot be attributed to methodological weakness. Because, if generalizations of the results are restricted to only those studies with the greatest methodological merit, the conclusions will not be significantly altered, and conflicting results will still far outweigh consistent findings. Instead of searching for generalizations, he assumes, as an alternative, that the implementation of compliance techniques requires understanding in terms of contextual relationships.

Social science. The author discusses methodological and epistemological debates in social and educational psychology. In social psychology, the author refers to Gergen who has offered the suggestion that social knowledge is historically dependent. Gergen regards theory building oriented toward prediction and control of human

behavior as illusory since it can never transcend the historical context in which it was developed. Furthermore, general social theories require understanding of specific and changeable situational forces. The predictive factor of any one factor in such a theory will vary drastically across time and situations. Next, the author refers to Schlenker who considers the social-psychology-as-history thesis unconvincing. Schlenker suggested that scientific approaches assume that regularities of human behavior exist, but these regularities need not be stated as universal laws. A third cited author Cronbach states that many of the inconsistencies of findings determined by traditional fixed-condition research indicate that higher-order interactions have not been adequately identified. Cronbach suggests relying on multiple correlational research instead of fixed-condition research. In educational research, the author notes a similar debate. He refers to Campbell & Stanley who advocate carefully controlled experimental research as the route to cumulative progress. The authors remarks that the criteria for methodological merit developed by the McMaster group for evaluating compliance research parallels this position. As an alternative, the author proposes qualitative, rich, situational 'ethnographic techniques' employed by anthropologists, such as participant observation. In his view, the potential strength of participant-observation is the opportunity to glean contextual relationships that might easily be overlooked in controlled experiments. Scientific progress includes, then, two complementary processes: hypothesis generation and hypothesis validation. Prospective clinical trials are, he thinks, more appropriate for hypothesis testing, while ethnomethodology can serve to suggest new relationships. The author acknowledges that hybrid approaches will create potential problems, as adding an observer might affect the variables in the study. A pragmatic problem is the time and expense required.

The author concludes that the discovery of patient compliance will require understanding of contextual constraints. As an aid to identifying these contextual relationships, researchers should borrow ethnomethodological techniques.

8

KOLTUN, A., STONE, G.C.

Past and current trends in patient noncompliance research: focus on diseases, regimen-programs, and provider-disciplines.

The Journal of Compliance in Health Care; 1, 1986, no. 1, p. 21-31, 4 ref.

nivel (C 2410)

Patient noncompliance is discussed within a historical perspective. Trends within the literature on patient compliance published between 1943 and 1984 are examined in the areas: (1) patient populations that have engaged attention of researchers, (2) contributions to compliance research made by different medical subspecialties, and (3) the major varieties of research which have been done within the area of patient noncompliance. The period between 1943 and 1977 was assessed by surveying the annotated bibliography of Haynes, Taylor and Sackett. The period 1978 to 1984 was examined through a survey of 'Index Medicus'.

Although the medical profession was aware of noncompliance from the earliest times the first research into noncompliance was not done until the 1940's.

Patient populations. Patient populations, such as 'children', 'psychiatric patients' and 'patients with hypertension' have received a great deal of sustained attention from researchers. Tuberculosis patients, who used to figure prominently in the compliance literature, have accounted for a progressively smaller percentage since the sixties. By contrast, there has been a steady increase in the number of studies involving diabetics, particularly from 1980 to 1984.

Medical specialties. The area of general medicine has remained a major contributor to the literature. Psychiatry has also been a major contributor, but not until the sixties. In the period from 1950 to 1954 three disciplines began to provide contributions: nursing, public health, and psychology. From 1954 to 1959 two additional disciplines began to contribute: pharmacy and pediatrics. The years from 1960 to 1974 witnessed contributions from three additional disciplines: psychiatry, dentistry, and the social sciences.

Research. Among the studies whose titles were sufficiently explicit as to indicate the type of variable studied in relation to noncompliance, it was found that the majority of investigators preferred

to study the relationship between noncompliance and patient-focused variables. Since 1972 there has been an upsurge of interest in provider/treatment-focused interventions, as well as a modest increase in context-related (patient's environment or setting of treatment) interventions.

Discussion. According to the authors, patient compliance has clearly become an interdisciplinary area and has remained so since 1960s. Nevertheless, general medicine and psychiatry, they write, remain the major contributing specialties. Regarding trends in patient populations, the authors found relatively little research being done on compliance among smokers, alcoholics, and participants in weight loss programs. They argue this is due to the distinction, researchers make between compliance and dropout studies.

The authors conclude that most of the current noncompliance research explores relationships between noncompliance and patient focused variables; rather than characteristics of the health care setting, the provider, or the prescribed regimen. The authors hope DiMatteo & DiNicola's book (see no. 1) will encourage researchers to give more attention to the characteristics both of practitioners and of health care settings.

9

TROSTLE, J.A.

Medical compliance as an ideology.

Social Science & Medicine; 27, 1988, no. 12, p. 1299-1308, 58 ref.

nivel

This paper discusses why therapeutic compliance is an important topic today. By reviewing twentieth century historical materials, the author describes how the concept of compliance evolved, and analyzes its assumptions.

The author argues that therapeutic compliance is a problematic concept with its own social history. Many research articles on compliance have evaluated a range of possible determinants and measures, but few have asked why compliance itself has prompted such research enthusiasm, or how it came to be so important. The author remarks that compliance researchers have produced more than 4000 scientific papers in the past two decades. Compliance researchers have explained the growth of their literature by linking it to development of antibiotics in the 1950s, and the subsequent wide

availability of these effective treatments. He considers the explanation to be incomplete because it fails to acknowledge that most healers in any historical period believe in and help to reinforce the curative powers of their treatment.

A history of medical compliance must explain the popularity of the concept by referring to cultural beliefs in curative substances and the history of the profession of medicine, as much as to the efficacy of pharmaceuticals. Rather than pointing to the efficacy of antibiotics to explain the growth of a concern for compliance, this historical study points to the developing consolidation of the profession of medicine, and the growth and sales strategies of the pharmaceutical and proprietary drug industries.

As a **case study**, a selection of advertisements from campaigns for infant feeding materials are analyzed. These show the development of a new professional and industrial concern for controlling the behavior of the weak and the sick. The advertisements show that a concern for therapeutic power evolved into a concern for patient compliance. The author shows that what clinicians now call 'compliance' used to be presented overtly as a matter of physicians 'control'.

Discussion. According to the author, to understand the importance of compliance today, the topic is better approached as an ideology supporting the authority of medical professionals. Analyzing the assumptions, the author notes that a paternal role was adopted by the profession in the 1950s, which had been replaced by a role as 'therapeutic partner' in the late 1960s. The author summarizes the assumptions about patient-doctor relationships as follows: the physician is the prior ultimate authority over the actions of his or her patients; in exchange for a physician's services a patient owes fee, cooperation, and compliance; noncompliance is usually the patient's fault; and the physicians offer therapeutic partnership to patients, not vice versa. Further, the author argues that concern for compliance serves professional purposes and the justifications for this concern change over time.

Recommendations. Analyzing compliance as an ideology is useful, according to the author, because it helps to explain why the literature is so large and yet so contradictory and incomplete. Looking at patient behavior in terms of medical compliance perpetuates the notion that health care is centered around proper use of physicians. The causes of problems in the patient-physician relationship are sought in patient behavior and beliefs. If research on people's use

of medications continues to be analyzed in terms of their compliance then this research will continue to give a distorted picture of behavior.

10
LEVENTHAL, H., CAMERON, L.
Behavioral theories and the problem of compliance.
Patient Education and Counseling; 10, 1987, no. 3, p. 117-138, 94 ref.
nivel

In this article, presentations are given of five major theoretical approaches to compliance research: biomedical, behavioral, communication, rational decision, and self-regulative systems. Summaries are made of their contributions and deficits. In the second part, the authors propose a method for integrating the theories into an overall view. They believe that the current theories offer limited guides for and are often inadequately applied in compliance research.

Biomedical perspective. According to the authors, the patient is, in this frame work, viewed as the recipient and performer of regimens that are to be accepted and obeyed. The model has caused investigators to focus on dispositional characteristics of the patient rather than on situational factors and cognitive processes. The countless studies in this area have failed to pinpoint any demographic or personality characteristic that distinguishes the noncomplier from the complier. Biomedically inspired studies have identified several non-dispositional factors, such as the characteristics of the disease and features of the regimen. In addition, biomedical researchers have made contributions to the measurement of compliance. However, the perspective ignores two key issues: psychological processes underlying compliance, and the effect of institutional structure and practitioner behavior on compliance.

Behavioral models. Behavioral strategies, according to the authors, have been most successful. They have also been used to increase compliance to long-term regimens. The most salient empirical defect of the behavioral approach is its demonstrated failure to maintain long-term changes in behavior. Further, they fail to identify the specific social, cognitive and motivational processes underlying change. Moreover, behavioral programs often fail to provide participants with a rational perspective on the relationship between behavioral outcomes and changes in risk or health status, and seldom

provide the individual with any guidance in evaluating these relationships (appraisal).

Communications approach. In this perspective, compliance is seen to depend on six major steps: (1) generation of message (2) reception of message (3) message comprehension (4) message retention (5) acceptance of substance of message (6) action. In addition to a clear statement of the message, the timing of the message delivery, and clarity of organization, the practitioner must also be able to persuade the patient, in accordance with communication studies. A variety of external factors, such as satisfaction with the practitioner, and patients rating of the practitioner's friendliness, warmth, empathy, interest, and concern are found to be related to compliance. A deficit of these studies, in the authors' opinion, is the small amount of information on how information about the health threat actually affects attitude change and then leads to compliance with the treatment instructions. Further, studies have shown that acceptance and compliance can be increased (by fear) without any change in comprehension. In general, there is a need for improved understanding of the way messages fit the individual's belief about factors affecting his other current physical status. In addition, the communications approach does not address the multitude of factors, such as self effectance and instrumental social support, which may be important for long-term compliance.

Rational belief theory. These models assume, according to the authors, that human behavior is determined by an objective, logical thought process. Decisions are viewed as the product of cost-benefit computation. The most widely used rational belief theory identifies four basic dimensions as the basis for behavior: (1) perceived probability of a threat, (2) perceived severity of the threat, (3) perceived benefits of health behavior, (4) perceived barriers of health behavior. The dimension of perceived barriers appears to be the most powerful predictor of health action, followed by vulnerability, benefits, and severity. According to the authors, The body of research provides strong support for consistent but modest associations between these attitudes and compliance behavior. The health belief model and other rational belief models do not specifically propose strategies or coping skills.

Self-regulatory systems theory. This theory conceptualizes the individual as an active problem solver whose behavior reflects an attempt to close the perceived gap between his or her current status and a goal, or ideal state. The self regulation model identifies

three stages: (1) cognitive representation of health threat (2) action plan or coping stage (3) appraisal stage (in which the individual utilizes specific criteria to gauge the success of coping activities). The model has three major deficiencies: paucity of supporting data; lack of standardized instruments; and the model is difficult to use because of their multivariate and transactional character.

Integration of models. The health belief model and operant behavioral model are used as examples of how theories can be integrated into the self-regulative systems framework. The authors believe that the placement of earlier compliance models in a self regulation framework will allow for linkages between approaches.

The authors conclude that the examination of isolated variables may prove valuable in particular situations, but will do little to advance a communicable theory. They believe the self-regulation theory will do better than the other theories in respect of integration between models, examination of interacting factors, and understanding of psychological processes.

11

JANZ, N.K., BECKER, M.H.

The health belief model: a decade later.

Health Education Quarterly; 11, 1984, no. 1, p. 1-47, 58 ref.

nivel (C 2434)

This article presents a critical review of 29 health belief model (HBM) related investigations published during the period 1974-1984, tabulates the findings from 17 studies conducted prior to 1974, and provides a summary of the total 46 HBM studies.

The HBM consists of four dimensions: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (see nr. 10 for theoretical discussion).

The following review-criteria were established: (1) only HBM-related investigations published between 1974 and 1984 were included, (2) the study had to contain at least one behavioral outcome measure, (3) only findings concerning the relationships of the four HBM dimensions to behaviors are reported, (4) the literature survey was limited to medical conditions, and to studies of behaviors of adults. Results are grouped under three headings: preventive health behaviors, sickness-role behaviors, and clinic-visits.

Discussion of the results. According to the authors, it is apparent from the 29 studies that research published during the last several decades provides substantial support for the usefulness of the HBM for understanding individuals' health-related decision making. To facilitate discussion, the authors created a 'significance ratio' in which the number of positive and statistically significant findings for an HBM dimension are divided by the total number of studies which reported significance levels of that dimension. Examination of this ratio across 29 investigations reviewed reveals that the best results are obtained by the 'barrier' dimension (91%) followed by 'benefits' (81%), 'susceptibility' (77%), and 'severity' (59%).
In an overall evaluation of 46 pre- and post-1974 studies, each HBM dimension was found to be significantly associated with the health-related behaviors under study: the significance ratio's orderings are: barriers (89%), susceptibility (81%), benefits (78%), and severity (65%). 24 studies focused on preventive health behaviors. While 'barriers' was most productive, 'susceptibility' was a close second. Most dramatic, according to the authors, is the finding that only 50% of the preventive health behaviors studies, reporting significance levels for 'severity', had obtained positive, significant results. They suggest that 'perceived severity' may be a concept of relatively low relevance in the area of preventive health behaviors, but of greatest salience to individuals with diagnosed illness. The results of HBM-sick-role behavior research, in their view, appear to support this contention: the significance ratio for 'severity' (88%) is second highest among the four dimensions.
Conclusion. The authors conclude that these investigations provide substantial empirical evidence supporting HBM dimensions as important contributors to the explanation and prediction of individual health-related behaviors. They notice that, prior to 1974, 'perceived susceptibility' was the most powerful dimension of the HBM, and in post-1974 research 'barriers' consistently yielded the highest significance ratio's, and this overall finding persists when all HBM studies are summarized. In general, the authors conclude, 'susceptibility' appears somewhat more important in preventive health behaviors than in sickness-role behavior, and the reverse is observed for 'benefits'. The most noticeable difference among HBM dimensions is the relatively low power of 'perceived severity' with the major exception of its importance to understanding sick-role behavior.
Recommendations. Given the numerous survey-research findings on the

HBM now available, it is in their view unlikely that additional work of this type will yield important new information. However, they see a paucity of experimental-design research. Further, the HBM does not dictate any particular intervention strategy for altering attitude and belief dimensions. Only a few investigations have been generated. Finally, the authors remark that there is a need to refine and standardize tools to measure HBM components more precisely.

12
ERAKER, S.A., KIRSCHT, J.P., BECKER, M.H.
Understanding and improving patient compliance.
Annals of Internal Medicine; 1984, 100, 258-268, 169 ref.
nivel (C 2402)

In this article, problems of patient compliance are described in relation to the 'health decision model', which combines decision analysis, behavioral decision theory, and health beliefs. According to the authors, there is a large body of empirically based literature suggesting that patient's belief make substantial contributions to their decision about cooperation with treatment plans.

Health decision model. The authors proposed the health decision model because they see practical and theoretical shortcomings in the 'health belief model'. The latter doesn't explain for example the failure to behave consistently with one's belief or the role of fear arousal on health behavior. In addition to the perceptions of the patient, the health decision model also recognizes the importance of factors such as experience, knowledge, and social variables. Support for these aspects in compliance literature is reviewed. The authors relate compliance interventions to (1) modifying general and specific health beliefs, (2) modifying therapeutic recommendations to reflect patient preferences, (3) modifying current experiences, (4) enhancing knowledge, and (5) modifying social interaction factors.

General health beliefs. According the authors, the importance of modifying general and specific health beliefs is shown by a large body of empirical literature suggesting that patient's attitudes make a substantial contribution to cooperation with treatment plans. These beliefs are readily assessed and can often be altered. In one study it was found that satisfaction with patient-physician relationship resulted in health beliefs that can alter compliance. Several other studies reported that satisfaction and resulting

compliance are greater when patients feel their expectations have been fulfilled, and concern and sympathy are shown. A controlled study showed the positive effects of physician awareness of health beliefs on compliance.

Patient preferences. Modifying treatment recommendations to reflect patient preferences can also enhance compliance. In the authors' view, the incorporation of patient preferences, regarding benefit and risk, into health decisions depends on the ability of the patient or physician to determine and communicate those preferences. One study showed that most patients were averse to taking risks when they were uncertain of therapeutic effects.

Experience with treatment regimens. Third, the authors assert that modifying current experience with respect to therapeutic regimens and health care providers influences compliance. The role of previous experience is considered to influence general and specific health beliefs. One way to modify current experience is the use of contingency contracts (see nr. 52). Data are discussed supporting the provider-client contract as a tool for improving patient compliance. Some studies provide support for the value of involving pharmacists in the improvement of compliance: it led to a reduction of deviation from prescriptions, and a decrease in the proportion of missed refills.

Knowledge. Fourth, the authors state that knowledge about disease and treatments influences patient decisions, but that its effect on patient compliance is unclear. Different studies have shown different effects of knowledge, ranging from no relationship to positive linkages. It was found in several studies that information regarding procedures and usual experiences have typically yielded beneficial effects on recovery. They note that a considerable amount of noncompliance may be involuntary, due to a disparity in patient and provider understanding. Two studies reported that many technical words are not understood by patients. Several other studies reported that information about the risk of adverse drug effects does influence patient attitudes regarding this risk.

Social interaction. At last, modification of social interaction factors such as social networks and supervision of the patient can improve compliance. Various studies have shown improved patient cooperation when frequency of home visits was increased, a home-monitor was used, and continuity of care was provided.

Ethics. In the authors' opinion, compliance strategies must be limited by certain ethical constraints. They discuss two ethical

questions: to what extent is the provider responsible for noncompliance; and what are some of the ethical limits on efforts to improve compliance?

13
HEIBY, E.M., CARLSON, J.G.
The health compliance model.
The Journal of Compliance in Health Care; 1, 1986, no. 2, p. 135-152, 75 ref.
nivel (C 2415)

A model for integrating a wide diversity of research findings related to compliance is proposed, termed the health compliance model. According to the authors, the numerous reviews of compliance literature, one citing over 200 factors, have been helpful in understanding the complexity of compliant behavior, but they fail to integrate findings into a systematic model. The proposed health compliance model incorporates three major classes of independent variables: 1) situational-antecedent variables, 2) organismic variables, and 3) consequence variables. Dependent variables are compliance-related behavior and/or their effects. The authors argue that the model differs from a strict operant functional approach and from the health belief model.

The authors review a variety of studies, classified into three independent variables, to demonstrate the utility of the health compliance model in integrating the divergent empirical research.

1. **Situational-antecedent variables.** Stimuli that can facilitate daily pill-taking include palatability of size and taste of pills (in accordance with 1 study), simple regimens (1 study), and calendar packs (1 study). Instructions with cues tailored to daily routines (1 study) and written instructions (1 study) also improved this kind of compliance. The role of media and education is controversial according to the authors; one study described the failure of mass media approaches, another study reviewed six methodologically sound studies which were more positive. A variety of reminders have been shown to enhance compliance-related activities, including mailed postcards (1 study), and telephone calls regarding appointments (1 study). In one study, telephone calls to patients were counterproductive in compliance with procedures on stopping smoking. Pharmacist promotion showed long-term effects in hypertension

patients in one study. Language that is easy to understand, and accurate recollection of instructions correlates positively with compliance in one study. Continuity of treatment (1 study), shorter interval between contacts (2 studies), and gradually introduction of requests (1 study) improved compliance. A moderately positive effect of social support from friends was shown in several studies investigating a range of compliance problems. Evidence favoring the influence of support groups has been obtained on smoking (1 study), dieting (1 study), and alcoholism (1 study). Several aspects of the subject-provider relationship appear to be correlated with compliance. The effectiveness of patient-provider contracts for a variety of medical regimens has been demonstrated in one study.

2. **Internal variables.** In three studies it was shown that stated intentions are good predictors on subsequent responding in several settings. Four studies documented the relationship between compliance and perceived benefits of medication and therapy. While no apparent relationship between actual severity of a disease and compliance with treatment was found in one study, the degree to which an individual perceives himself to be at risk bears a correlation with compliance, in accordance with 3 studies. In several studies it was found that if the therapist is perceived as satisfactory, competent, friendly, and interested, there are likely to be positive benefits. By contrast, if the therapist is businesslike there may be negative impact on compliance. One study reported that when the patient's expectations regarding therapy are met, there is likely to be a positive impact. Several studies have indicated that an individual is more likely to comply if he or she exhibits an internal locus of control. Several studies have found that training in self-management improves compliance for hypertensives.

3. **Consequence variables.** There is a massive literature concerning the effects of reinforcers and punishers. According to the authors, there are numerous studies demonstrating the positive effect of consequence variables, such as money and social rewards, on compliance. Research investigating effects of punishment, such as side effects, money costs and time involved in meeting, is not as extensive as the reinforcement, but has also met consistent findings.

Conclusions. According to the authors, their review indicates that the current evidence can be conveniently conceptualized into the health compliance model's three components. They admit, the effectiveness of this model remains to be determined. They regard the model as a heuristic for integrating existing disparate literature.

14
ROTH, H.P.
Measurement of compliance.
Patient Education and Counseling; 10, 1987, no. 2, p. 107-116. 28 ref.
nivel

This report is mainly concerned with methods of measuring patient compliance with medical regimens. Seven types of measurement are reviewed: (1) patient self-report, (2) physician' estimates, (3) keeping appointments, (4) request for prescription refills, (5) pill count, (6) medication monitors, and (7) measurement of level of drug or metabolite in blood/ urine. The author argues, it is important to take the definitions in account of reviewing these seven types.

1. **patient self-report.** Although some investigators have stated that this is a good measure, four studies have proved otherwise. When patients statements are compared with more objective measures such as pill counts or urine tests, it is found that their statements are untrue. The author concludes on the basis of three studies that the nature of the patient population may be an important factor. More accurate reports were obtained from steel workers with hypertension and in two studies from patients with heart diseases.

2. **Physicians' estimates.** In one study, it was found that, although physicians grossly overestimated their patients' drug intake, there was a significant correlation between physicians estimates and patients' intake. The same study reports that 11 physicians in practice were more accurate in their estimates than were 27 medical residents. These findings differ from a second study, in which a group of physicians' judgment was no better than chance. This contradiction is not discussed by the author.

3. **Keeping appointments.** One study reported that the correlation between percentage of appointments kept and the percentage of prescribed drugs taken is low in treatment of chronic ulcer patients. These results are corroborated by two other studies of tuberculosis and hypertension.

4. **Request for prescription refills** (= the number of pills which the patient requests refill of prescription). One study reported a correlation between number of pills obtained and percent of positive urine tests of .47. In another study it was found that 54 patients who were judged as compliant by urine test, three had obtained less than 60% of their prescribed medicine.

5. **Pill count.** The author argues that, although this method appears

objective, comparisons of the pill count with blood or urine levels in three studies showed it is not totally reliable. In a fourth study it was found that bottle counts overestimated intake. The author remarks that it is easy for a patient to dispose of pills if they believe they are being checked.

6. **Medication monitors** may use radioactive material, photographic film, and mechanical devices. In the author's view, they have the advantage that the measurement doesn't depend on the patient's memory. He states, however, that none of the medication monitors available establishes whether the patient has taken his medicine.

7. **Measurement of level of drug or metabolite in blood or urine.** Several studies show that techniques for these measurements are being developed for many drugs and their metabolites. The author remarks that the results may depend upon factors other than compliance, i.e. bio-availability, absorption, metabolism and excretion. He writes it is difficult to draw conclusions because of the many other operative factors.

Recommendations. The author suggests a method for clinicians. The cheapest and simplest method for determining whether a patient has taken his medicine is to ask him. If the patient answers that he did not, this is probably true. If not, the clinician can use pill count or prescription fills. If he still remains in doubt, he can obtain a level of medication in blood or urine from a laboratory where this facility is. In the author's view, research priority should be given to the development of simple, inexpensive methods for measuring blood or urine levels.

15
LEVY, R.L.
Social support and compliance: salient methodological problems in compliance research.
The Journal of Compliance in Health Care; 1, 1986, no. 2, p. 189-199, 42 ref.
nivel (C 2411)

In this paper, the author reviews the methodological problems of definition, measurement and independent variable in social support literature. Some methodological standards for research are suggested. According to the author, there are three methodological problems with social support literature which obscure conclusions

about the effect of social support on compliance.

Definition. The first problem is that there are numerous definitions of social support and many of these definitions are stated in such broad terms as to allow for endless possibilities in operationalizing each definition. Some investigators defined social support as support accessible to an individual through social ties to other individuals, groups and larger communities. Others added professional and financial support to the definition. A third group of investigators included clinical outcome as a goal supported by other persons. A fourth group has attempted to order definitions along three dimensions: quantitative versus qualitative, instrumental versus expressive, and the source of social support. Other writers stressed the measurable aspects.

One way to address the varying components of social support is to continue searching for a complete 'correct' operational definition of social support. According to the author, this goal is unattainable, and she recommends viewing the phrase 'social support' as a generic term like the term 'reinforcement': a complex term that may vary from one individual to another, or even within one individual over time.

Measurement. A second problem is the number and type of measures of compliance. According to the author, the literature reviewed presents the same problem as other areas of compliance literature. These reviews report that most measures rely on clinical outcome. The author argues that clinical outcome may be an invalid way of measuring adherence.

Independent variable. The third problem is the poor determination of how, and if, social support as an independent variable is manipulated as planned. Several studies are reviewed for their method of ensuring safeguards to the integrity of the independent variable. For each study, the methodological problems, like experimental design, definition and measurement of the independent variable, are discussed separately.

Recommendations. According to the author, there is a lack of consistency and clarity in the definition of social support. She suggests to use the term in a generic sense, like 'reinforcement'. Each study should make its own operational definition. On measurement, the author suggests not solely relying on clinical outcomes. On the third problem, she advises researchers to ensure that experimental manipulations are conducted as planned and reported.

16
BRUER, J.T.
Methodological rigor and citation frequency in patient compliance literature.
American Journal of Public Health; 72, 1982, no. 10, p. 1119-1123, 5 ref.
nivel

The bibliography of Haynes et al. which assesses the methodological rigor of the patient compliance literature, and citation data from the Science Citation Index (SCI) and the Social Science Citation Index (SSCI) were combined. The author wants to determine whether methodologically rigorous papers are used with greater frequency than substandard articles by compliance investigators.

Method. Six methodological standards were applied in the bibliography: study design, selection and specification of study sample, specification of the illness or condition investigated, the compliance measured, description of the therapeutic regimen, and the definition of compliance used. The six scores in each paper yield a methodological profile, while the total score gives an overall estimate of the article's methodological rigor. On the other hand all citations from the first four years after publication were compiled to give a total citation score for each article (sample = 154 articles published in 1976).

Results. The spearman rank correlation between methodological score and total citation score was .26. According to the author, this correlation indicates that citation score would not be a reliable indicator of an individual paper's methodological rigor.

To further examine the relationships between citation and rigor, the sample was divided into low, middle and high methodological score and idem for citation score. The results revealed that articles in the high citation class could be expected to have higher methodological scores than articles in the middle and low citation class. The difference in methodological score between the middle and low citation classes was not significant.

Discussion. The author concludes that the low correlations do not warrant using citation score as an indicator of methodological rigor. After partitioning the sample into classes, he concludes there is significant difference between the extreme classes. The middle group of articles, however, cannot always be distinguished from the high and low classes.

17
STONE, G.C.
Patient compliance and the role of the expert.
Journal of Social Issues; 35, 1979, no. 1, p. 35-59, 83 ref.
nivel (C 2408)

In this review, theoretical approaches to patient-compliance are discussed. The author's purpose is to explain their consequences for the role of the expert. He categorizes the theoretical approaches in terms of the explanatory variables: (1) the personality trait approach, (2) psychodynamic interpretations, (3) the sociocultural approach, (4) learning theories, (5) cognitive theories, (6) the health belief model, and (7) the health transaction model.

1. The **personality trait approach** searches for psychological traits and demographic factors. The author remarks that these factors can hardly be changed. Therefore, this approach does not generate any recommendations for action by experts who hope to see their advice taken. At its worst, he argues, it tends to fasten the responsibility for a problem on the person who suffers from it. Such 'blaming the victim' consequences were exemplified by one survey of physicians' beliefs about the reasons for patient noncompliance.

2. **Psychodynamic interpretations** stress the significance of various aspects of the treatment situation. In this view, non-adherence may arise from an active resistance based upon the patients' unconscious fears and conflicts. To the extent that psychodynamic theories rely on conscious factors in patients, they imply, according to the author, that the expert bears the major responsibility for improving compliance.

3. The **sociocultural approach** stresses the importance of cultural and subcultural roles, beliefs, practices, and taboos concerning health. Three studies reported that compliance with medical regimen tends to be lower in groups with strong folk patterns for dealing with illness. From this perspective, the role of expert, the author writes, involves an awareness of the potential effects of sociocultural factors, and appropriate modification of his behavior to maximize adherence.

4. **Learning theories** appear in several versions, ranging from

theories that attend primarily to rewards, punishments, and discriminative stimuli to theories that emphasize self-control behaviors. Across the range, these theories emphasize the responsibility of the expert.

5. **Cognitive theories** focus strongly on the conception that human beings are self-conscious decision-makers. Most of the educational approaches implicitly base their arguments on a cognitive theory. Given this viewpoint, the expert's responsibility is often seen as ending when the proper words have been spoken. The author concludes that; whereas learning models have the potential for leading to overemphasis on the responsibility of the expert, purely cognitive models, through their overestimates of rationality, tend toward the opposite.

6. The **health belief model** turns attention to the functioning of beliefs about health and illness of the individual. The principal virtue of this model - its capacity to explain numerous findings -, in the author's view, becomes a drawback in planning an intervention. The health belief model recognizes that multiple variables guide the patient's behavior, but doesn't recognize the determinants of the expert's behavior.

7. In the **health transactions model**, compliance is viewed as a property that arises in a transaction between two people. The health transaction is divided in different stages: the early stages occur prior to the communication between expert and client; then come the stages of direct communication; and finally there are the stages that follow the communication when clients have returned to their home settings. Viewing compliance as a property of the transaction between expert and client, the author sees the responsibility for establishing compliance as shared between expert and client.

Recommendations. The author assigns three areas of responsibility to experts: exploring the individual patient's situation fully; anticipating the patient's difficulties in following recommendations; and communicating information in a way that will maximize its effectiveness.

18
GARRITY, T.F.
Medical compliance and the clinician-patient relationship: a review.
Social Science & Medicine; 1981, 15E, p. 215-222, 49 ref.
nivel

In this paper, a four-category classification of research (extending back to the early 1960's) on elements of provider-patient interaction (that appear related to compliance behavior) is presented. The first category describes research on pedagogical techniques employed by practitioners to inform patients in detail of the patient behaviors prescribed to deal with the medical problem. The second category of research deals with studies that indicate an association between extensive clinician-patient sharing of expectations about appropriate behaviors and good patient compliance. The third category contains studies that reveal links between patient's assumption of responsibility for his own therapy and compliance. The fourth category contains research linking positive tone of the clinician-patient interaction with good patient adherence.

1.**Pedagogical technique.** In a study of the link between comprehensibility of the physician's medical recommendations and patient compliance, an association was found between the intelligibility of the instructions and amount of medication-taking error. In a second study, with a different design, the same investigators also found an intelligibility-compliance association. The measures of compliance and comprehension were subjective reports from patients. In a third study, it was found that the more congestive heart failure patients and their physicians agreed on the issues discussed during the medical visit, the more compliance (measured by reported medication taking errors) was observed. According to the author, these results suggest that the adequacy of doctor-patient communication affects compliance with medical advice. A fourth study also found that congruence between doctor's and patient's perception of what the patient should do was greatest in situations of greatest explicitness. In a fifth controlled study, the presence of an experimental maneuver improved medication-taking compliance (but not diet adherence and appointment-keeping) and significantly increased the proportion of patients achieving blood pressure control. Two more recent studies of contingency contracting between hypertensive patients and their nurse-educators add support for the notion that explicit and precise communication of therapeutic expectations to

the patients promotes adherence. In a fifth study, a pedagogical strategy of direct, explicit communication by the practitioner of his therapeutic recommendations showed no improvement in blood pressure; however compliance with medication-taking advice and weight loss exceeded those of the control group.

The author concludes that the correlational and intervention studies described in this section provide support for the notion that practitioners who manage to present therapeutic recommendations to patients clearly and specifically find higher levels of follow-through in their patients. This proposition may be consistent with recent results that find patient knowledge of the recommended regimens correlated with adherence; while more generally knowledge of the nature of the disease is not correlated.

2. **Reciprocality of expectation.** In one study it was found that patients with unfilled expectations were significantly less likely to return for the next scheduled psychotherapy appointment. Others have reported similar associations between expectations regarding conduct or results of psychotherapy and dropping out of therapy. Another investigator postulated that as the nature of physician-patient interaction departs more from the culturally-prescribed norms, compliance decreases. He found some support for this normative behavior-compliance link. In a third study, compliance, measured for the most part by unvalidated reports of parents and interviewer judgments, was found to be associated with fulfillment of patient expectations.

The author notes that proposed strategies for increasing compliance derived from literature on expectation reviewed have not been tested. He concludes that, although this aspect of the clinician-patient interaction is not extensive in terms of numbers of studies, the research findings are consistent: complementary expectations regularly yield patient satisfaction and following of advice.

3. **Patient responsibility.** The author remarks there is a modest literature that proposes patient 'activation' and assumption of greater responsibility 'vis-à-vis' the practitioner as a condition needed for maximal compliance. In one study, a high 'active patient orientation' was found associated with greater blood pressure control, greater adherence to prescribed health promoting activities, fewer medication side effects and better understanding of treatment procedures. In a second study, a randomized intervention was designed to encourage patients to take greater responsibility by asking more questions of their physicians. The intervention strategy

appeared to have increased patient initiative-taking; experimental subjects showed a significantly greater internal locus of control score. In a third study, investigators found that implementation of a 'negotiation' method was associated with improved compliance. In a fourth controlled study, dropout from care was significantly less in a negotiated intake group. In a fifth study, it was found that a strategy of negotiating and co-authoring increases patient responsibility for and involvement in self-care. Based on these findings the author assumes (because no evaluative data were yet available from this research) that better adherence would be found in such active patients. A sixth study on techniques of role-playing, behavioral rehearsal and identification with peers did not report significantly greater compliance than in controlled conditions. However, an 18% improvement was noted in the number of patients in good blood pressure control about 6 months after the trial ended.
The author concludes that studies dealing with the 'active patient' concept are recent and relatively few. The challenge of designing research that clearly separates the patient activation elements in affecting adherence has not yet been met.

4. **Affective tone of the interaction.** In one study, approachability, defined as an amalgamation of signs of friendliness, interest and respect for the patient, was found directly associated with level of patient compliance. Approachability was also associated with amount of patient questioning of the physician. In a second study, the affective tone of the interaction was consistently associated with compliance. The author notes that few other investigators have addressed this relationship. Further, no intervention trials have attempted to manipulate the affective quality of the clinician-patient interaction to influence compliance.

Conclusions. The author summarizes the methodological state of art in the four categories. The first category contains studies of both correlational and experimental design. In the second category, research has not yet proceeded beyond correlational and descriptive research designs to experimental design. In the third category, the supporting research is both correlational and experimental. In the fourth category, research design has not yet reached the experimental level of development.
For future research, the author remarks that a differentiation of the term 'clinician' into physicians, nurses, health educators or others and differentiation to the variety of illnesses is needed.

19
LEY, P.
Satisfaction, compliance and communication.
British Journal of Clinical Psychology; 1982, 21, p. 241-254, 108 ref.
nivel (C 2407)

This review focuses on the relationships between communication, compliance, and satisfaction. Attention is given to methods for improving communication. The author categorizes the literature into the topics: (1) patient satisfaction, (2) compliance with advice, (3) the transmission of information from patient to doctor, (4) intelligibility of health communications, (5) recall of medical information, (6) potentially harmful effects of fuller information for patients, and (7) theoretical approaches.

1. **Patient satisfaction.** Satisfied patients, according to the author, are more likely to comply. Patients' satisfaction with the consultation (in 1 study), satisfaction with communications (3 studies), and general satisfaction with medical care received (1 study) correlated with patients' compliance with advice.

2. **Medical advice.** Many attempts have been made to delineate the non-compliant patient's characteristics. Referring to several other reviews, the author concludes that none of the following is related to non-compliance: the patient's sociodemographic or personality characteristics, the doctor's characteristics, illness variables, including duration and severity of the illness. Variables which do seem to be related to non-compliance include: duration and complexity of regimen, patient's levels of dissatisfaction, lack of supportive follow-up, patient's perceptions of their vulnerability to the consequences of the illness, the seriousness of the illness, the effectiveness, and the problems caused by the treatment.

Two investigators reviewed investigations of the effects of written information and found that in the case of short-term medication six out of seven investigations reported greater compliance in groups receiving written information. In the case of long-term treatment, only six out of eleven studies reported greater compliance.

In the author's view, few if any social psychological findings have emerged, but several of the variables investigated have had significant effects on at least some occasions, e.g. degree of fear aroused in subjects; bias of argument; frequency of exposure to appeals to fear; and position of appeals to fear in the message.

The wisest method, the author believes, of increasing patients'

compliance is to discover the features in the particular situation which contribute to non-compliance. It was found that waiting time, lack of 24-hour availability, and variations in staff seen on different visits contributed to a 24 % clinic dropout rate. When these factors were attended to, the drop-out rate was reduced to 8%.

3. **Transmission of information.** Investigators evaluated the effects of providing information to experienced doctors. Patients whose physicians had attended an experimental tutorial acquired greater knowledge of their illness, were more compliant and achieved better control of their hypertension.

4. **Understandability.** One study reported that 53-89 % of the patients do not understand instructions.

5. **Recall.** Eleven investigations of patient's forgetting of material show a percentage ranging from 31-71 %. Age didn't correlate with forgetting in four studies.

6. **Potentially harmful effects of fuller information for patients.** Two studies reported no or little increase in depression or anxiety when fuller information was given. A series of three studies reported that fuller information about drugs does not appear to decrease compliance.

7. **Theoretical approaches.** The author views the health belief model as the best-established theoretical approach in the field. In terms of published results it seems well supported. However the author remarks, most research is correlational rather than experimental, and retrospective rather than prospective. Ley's own cognitive model of communication and compliance claims that a significant portion of the variance in both patient satisfaction and compliance can be accounted for by comprehension and memory variables. According to the author, much of the relevant evidence has been reviewed and much of this has been consistent with cognitive model. Some counter-evidence has forced the author to elaborate the model.

20
FEINBERG, J.
The effect of patient-practitioner interaction on compliance: a review of the literature and application in rheumatoid arthritis.
Patient Education and Counseling; 11, 1988, no. 3, p. 171-187, 55 ref.
nivel

This review deals with the effects of the patient-practitioner interaction on compliance with treatment programs for rheumatoid arthritis. The author divides the interaction into four elements: pedagogical techniques, sharing of expectations, patient's assumption of responsibility, and affective tone.

A search of 'Index Medicus' was completed, and all studies published in the English language medical literature between 1960 and 1986 were viewed. Fifteen studies were selected. Although no studies were designed to examine the patient-practitioner interaction, they have addressed various aspects of this relationship in secondary analyses.

Pedagogical techniques. Four studies investigated the understanding of education programs. In a first study, results indicated that a higher proportion of compliant patients (53%) than noncompliant ones (31%) considered that they had received an adequate explanation of the nature of the disease. In a second study, examining compliance with an exercise regimen, no significant difference was found between compliers and noncompliers with regard to patient's understanding of the disease. In a third study of splint use, noting a 50% compliance rate, patients with rheumatoid arthritis reported pain relief from wearing splints but did not report donning them for that purpose. The investigators concluded this was a teaching problem. In a fourth study of hand splinting, a compliance rate of 62% was found, when patients were informed to expect pain relief from splinting. The author remarks that whether this increased rate of compliance was related to education is not known.

Three studies investigated teaching aspects of education programs. The results of a controlled study indicated that, although knowledge about their disease significantly improved, education-support groups had little effect on subsequent compliance with prescribed exercise programs. The results of a second study, comparing computer-based education group and a control group, showed in both cases increases in: knowledge, observation of joint protection principles, and time resting. A third controlled study, comparing the relative effective-

ness of self-instruction, self-instruction with practice, and self-instruction with practice and contracting, showed improved compliance in all three groups with no significant differences between groups. According to the author, a structured and systematic teaching of concepts may be of more importance than the specific teaching modality used.

Sharing of expectations. According to the author, no studies examined the sharing of expectations between health practitioners and patients, but patient's expectations were addressed in the following studies. In one study it was found that patients, who believed that the crippling effects of arthritis were inevitable, complied much less frequently than those who were less resigned to eventual disability. A second study showed that lack of belief in the benefit of the therapeutic regimen increased noncompliance with aspirin therapy and exercise. A third study found no relationship between compliance and the patient's perceived benefit of an exercise program. A fourth study found no association between patient's perception of physicians' expectations of compliance and the use of hand splints.

Patient's assumption of responsibility. One study of several nonsteroidal anti-inflammatory drugs (NSAIDs) and a placebo was conducted. One observed result was that compliance for a given NSAID was greater if the patient was not encouraged to seek alternative therapy.

Affective tone. In a study, it was found that 61% of those patients who perceived the doctor to be personal were full compliers, compared to 35% who felt that the doctor was more business-like in his relationship with the patient. While there is no further support in the arthritis literature, affective tone has been shown to influence compliance with other medical populations, according to the author.

Recommendations for clinical application. In case of pedagogical techniques, the author suggests that health professionals should apply learning principles to patient education. In addition, he or she should emphasize the necessity of adherence. To approach the problem of the physician's awareness of the expectations and needs of the patient, the author suggests designing an assessment form to determine what socio-behavioral factors might facilitate or impede the relationship between patients and physicians. In case of the patient's responsibility, the author suggests encouraging patients to participate actively in their health care. They should be involved in treatment planning and decisions through the use of

contracts or mutual goal-setting techniques. Because arthritis affects so many aspects of life and causes pain, anxiety, it is essential for patient compliance that the physician listens and shows compassion.

Future research. According to the author, there is a need for compliance studies which search for predictive variables which can be easily measured and are amenable to change. Diagnosis, drug identity, regimen complexity, and appointment frequency may account for only 20-30% of the variance in compliance behavior. Thus, the personal interaction may be the key element in predicting variance in compliance. Experimental designs, using multivariate statistical techniques, can provide estimates of how much variance in compliance is explained by these variables. For chronic illnesses, longitudinal studies are also needed to determine how physician-patient interactions change over time. Because a patient may have contact with a variety of allied health professionals, it needs to be addressed if findings from physician-patient interactions are applicable to allied health professionals. Finally, the author wonders, considering the current state of health care delivery in the US, if decreased time with a health care provider will result in decreased compliance.

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LEVY, R.L.

Social support and compliance: a selective review and critique of treatment integrity and outcome measurement.

Social Science and Medicine; 17, 1983, no. 18, p. 1329-1338, 71 ref.

nivel

This paper presents a selective review and critique of the literature on social support as a factor in the enhancement of patient compliance with medical regimens. The review highlights theoretical approaches, definitions, correlational and experimental studies.

Theories. Several writers have incorporated social support into theories explaining health and behavior. The author discusses the role of social support in the health belief model, social learning theory, cognitive-emotional theory and motivational models. The author concludes that all theoretical positions agree that recovery from illness is related to social support.

Correlational studies. A number of studies have measured the re-

lationship between social support and adherence. In one study, a relationship was found between patients reports of family encouragement & cooperation and treatment outcome. In a second study, it was found that social support explained most of the variance in 'fertility behavior'. A third study, using self-report data found that patient who perceived support at home reported high levels of adherence. The author writes that most correlational evidence seems to support the positive relationship between social support and compliance or health outcome. However, any conclusion must be made with caution, as the majority of studies did not utilize an objective, or validated, measure of compliance and social support was most often measured by questionnaire, not observational data.

Experimental studies. These studies are grouped into four categories: home visits, other significant training (not at home), structured reinforcement/contracting, and group support.

1. Home visits. It was found that after 18 months the blood pressures of hypertensive patients dropped significantly in home monitoring and home visits groups; after 24 months only groups with home monitoring and home visits by public health nurses maintained a significant drop. In another study, specific family support intervention did not appear strong for medication compliance and showed positive effects similar to other interventions on appointment-keeping and blood pressure control. A third study didn't show an effect on compliance by home visits alone.

2. Significant other training (not at home). One investigator found no significant differences in clinical outcome (blood pressure) between training with and without partner. In another study it was found that at a 10 week, post treatment time, subjects in duo training did significantly better than those in the other two groups (weight loss). In four other reports, duo training (for weight loss) seemed to have no effect. Two later studies did contribute some, but not overwhelming support for the effect of spouse involvement in obesity programs.

3. Structured reinforcement/contracting. Two independent investigators found that monetary reinforcement for behavior change was most effective for producing and maintaining weight loss.

4. Group support. In one study, hypertensive patients participating in weekly meetings did better than controls in 2 and 6 month follow up on compliance as measured by pill count. In a second study it was found that subjects participating in groups decreased their blood pressures while controls did not. In a third controlled study of

group support, no differences in weight were observed at 52 weeks. The 'buddy system' has been utilized in several programs, often with contradictory findings, according to the author. Two studies demonstrated the superior effects of a community program.

Recommendations. The author makes methodological recommendations. Future research should clearly specify the form of social support to be conducted in the home, in training sessions, and in support groups. Observational studies, for example, could be used to asses how social support for compliance is operationalized in naturally occurring situations.

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RISSMAN, R., ZIMMER RISSMAN, B.

Compliance. 1. noncompliance: a review 2. facilitating compliance.

Family Systems Medicine; 5, 1987, no. 4, p. 446-467, 38 ref.

nivel (C 2413)

In this article compliance is viewed from a 'family therapeutical' perspective. The authors argue that the standard interventions (education, behavior-modification etc.) used until now have met little success. These interventions are based on the assumption that noncompliance is due to a deficit in the patient. The context in which noncompliance occurs is rarely considered in medical literature. Therefore, the authors consider compliance in this review in a context on different levels: (1) individual, (2) family, (3) ethnic-group, and (4) physician consultation. The second part of the article is devoted to family therapy as a solution for noncompliance.

1. On the **individual level**, the authors view the health belief model as an adequate indicator of determinants of noncompliance. The model can help the physician to recognize a 'problem patient'.

2. In a review of studies at **family level**, family support was found to have a positive influence on compliance behavior with regard to weight control, alcohol treatment, and participation in cardiovascular fitness programs. For example, in a study of a screening program it was found that compliance with recommendation to obtain screening was greater when husband and wife shared the same health beliefs.

3. At **ethnic-group level**, the authors document evidence that help-seeking behavior is strongly influenced by ethnic background. One

study reported that patients of Hispanic descent may seek relief from a 'curandero' prior to or simultaneously with seeing a physician. A second study showed that Chinese patients tend to see illness as strictly physiological in origin and would consider a physician's explanation of psychological factors inappropriate. In a third study, it was found that Italian, Irish, Jewish, and white Anglo-Saxon Protestant patients differed significantly in their responses to pain and expectation of treatment. The authors argue that an awareness of ethnic differences aids the physician in anticipating problems with compliance.

4. At the **physician's level**, many writers have argued that the doctor-patient interaction must be improved to enhance compliance. Three studies of the context of the consultation are reviewed. In one study it was found that doctors who encourage discussion and are interested are more successful in getting patients to follow their advice. A second study reported that patients who felt they knew their doctors well were more likely to follow advice. A review of literature suggested that spending more time with patients, regardless of the content, is associated with increased compliance.

Family therapy. The authors propose family therapy as an strategy to improve compliance. They discuss several conditions and techniques of family therapy. First, the therapist must join the family members in a way that creates a supportive environment. Second, an approach that has already been tried by other family members and has failed must be avoided. Third, the therapist must try to reframe the view of the problem by the patient. Fourth, the treatment plan can be presented with the help of significant others. Fifth, when a chronic illness is diagnosed, a family conference can be scheduled to aid in assessment and to discuss the illness and the treatment options. Finally, consulting and referral issues are discussed.

Despite drawbacks, like time and organization, the authors believe that family therapy can short-circuit or prevent compliance problems, thereby easing the physician's job in the long run.

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BLALOCK, S.J., McEVOY DEVELLIS, B., SANDLER, R.S

Participation in fecal occult blood screening: a critical review.

Preventive Medicine; 1987, 16, p. 9-18, 22 ref.

nivel (C 2437)

In this article, the findings of six studies that have examined participation of people in fecal occult blood (FOB) screening. According to the authors, participation in FOB screening can be separated into two distinct components. Individuals first decide to participate; and then complete or do not complete the screening procedures. The authors term these components 'agreement' and 'compliance'. In combination, they use the term 'participation'.

The authors discuss the relationships between screening participation and selected demographic characteristics, physical health status, family history, personal experience, practice of other preventive health behaviors, and health beliefs.

Results. According to the authors, no consistent relationship has been demonstrated between sex and participation in five studies. Three studies reported that participation declines after the age of 65 to 75 years. Another study found no relation between age and agreement. A third study reported that participation was greater among subjects over 50.

In two studies it was found that having experienced a recent serious illness related to participation in FOB screening. A third study reported no relationship between compliance and subjects' perceived health status. A fourth study separately examined subjects' agreement and compliance with the procedures. They found that subjects who experienced symptoms within the past year were more likely than others to agree to participate, but were not more likely to comply with the procedures. A fifth study reported that individuals with first-degree relative with colon cancer were more likely than others to agree to participate in FOB screening, but were no more likely to comply with procedures.

Three studies, focusing on either agreement or overall participation, reported that knowledge of others with colon cancer was positively related to FOB screening participation. In another study it was found that smokers were as likely as nonsmokers to agree to participate in FOB screening, but were less likely to comply with the screening procedures.

Three studies used the health belief model as a framework for

examining decisions to participate or not in FOB screening. The findings of two studies indicated that those with higher levels of perceived susceptibility to cancer are more likely than others to agree to participate in screening, but are not more likely to comply with the screening procedures. Four studies reported that high levels of perceived severity do not appear to influence individual's agreeing to participate in FOB screening, but do interfere with their carrying out the procedures. Perceived benefits of the efficacy of treatment, in the authors' view, appear to be related to participation. One investigation into perceived barriers reported that individuals who believed participating in FOB screening would be embarrassing, distasteful, worrisome, or would cause discomfort or inconvenience were less likely to agree to participate in screening. Compliance appeared to be related only to embarrassment and worry. In addition to health belief model concepts, in one study it was found that individuals who believe that smoking and diet affect health are more likely than others to participate. It was also reported that the belief that illness is a matter of chance is negatively related to participation, whereas the belief that individuals should have regular checkups is positively related to participation.

Discussion. The authors discuss three issues relevant for future research. First, researchers should distinguish between different types of beliefs and attitudes. They assert that the majority of beliefs examined in FOB screening literature provide little insight into why people decide to be screened, and knowledge of these relationships does not suggest strategies for increasing participation. Second, many of the apparent inconsistencies between individual's behavior and their beliefs and attitudes may be due to the failure to measure beliefs and attitudes that correspond to the behavior being examined. In general, they remark, behaviors are highly specifically, but beliefs and attitudes are usually measured at a more general level. Third, researchers should distinguish between individual's intentions to perform a certain behavior and their actual performance of that behavior. Much of the confusion in FOB screening literature, they believe, may be attributed to the failure to distinguish between measures of a subject's stated intention to participate in screening and measures of whether they actually completed the test. They conclude that the assumption that beliefs in these two types are similar is wrong. Factors that lead to agreement often differ from those leading to compliance.

24

POSAVAC, E.J., SINACORE, J.M., BROTHERTON, S.E., HELFORD, M.C., TURPIN, R.S.

Increasing compliance with medical treatment regimens: A meta-analysis of program evaluation.

Evaluation and The Health Professions; 8, 1985, no. 1, p. 7-22, 20 ref.

nivel (C 2412)

This article concerns a quantitative integration of research articles measuring effects of programs to increase patient compliance. The purpose of the authors is to investigate if such programs in general are effective enough to justify wide application. The technique of meta-analysis is used to quantify and compare the data. Literature was selected on patient compliance with medical treatment. Studies on substance abuse, weight reduction, and psychotherapy were not included. The authors selected only experimental studies with at least two groups, an experimental group and a control group. Studies using only one group (yielding pre- and post-test figures) were excluded. This resulted in 58 studies, containing a total of 96 different interventions. These are the base of the meta-analysis.

Meta-analysis. In meta-analysis the effect of a program is expressed in an estimated effect-size (ES). An effect-size is computed by taking the difference between the mean score of the experimental group and the mean score of the control group. This difference is divided by the standard deviation of the control group. An effect-size can be converted into a percentile rank score indicating where the experimental group's mean would be found, relative to the control group distribution.

Nature of compliance interventions. The most used intervention methods or strategies in the studies were: providing information (53%), reorganizing facilities (19%), including in daily routine (10%), teaching self monitoring (8%), encouraging social support (5%), shaping adherence (2%) and, multiple strategies (2%).

The principal media used in the interventions were one-on-one contact, multiple media, and written material. Evaluations of the compliance program were largely conducted with outpatients (69%).

The authors remark that a theoretical basis to the educational program was only mentioned in 11 of the 58 programs.

Compliance effect sizes. The overall mean effect size of all measures was .47 with a standard deviation of .56. This indicates that

the average member of the experimental groups complied better than 68% percent of the control groups.

Comparing types of compliance. Three types of compliance were distinguished: 1) actual treatment compliance as for example taking medication, 2) being available for care as in keeping appointments, 3) behavioral change as in losing weight.

The analysis reveals striking differences between these forms of compliance. Changing a patient's level of compliance to medication prescriptions is markedly easier than getting patients to come in for care (effect sizes are respectively .62 and .35). Improving compliance with lifestyle behavior changes and with preventive programs appears to be most difficult (effect size .19).

Comparing types of intervention. The most effective intervention appeared to be helping patients to include the desired behavior in their daily routines (effect size .71, meaning the mean level of compliance in the experimental group was better than 76% of the control group patients). Interventions based on changing the organization of care delivery were also quite successful (reducing waiting time, reminders of appointments and so on). Effect size of those interventions was .54. Encouraging social support and teaching self monitoring seem to be not very effective in the studies (ES is respectively .27 and .30). Providing information may be considered as moderately effective with an effect size of .42.

Very strong effects are found in three studies, one of these utilizing multiple interventions, and two studies based on a behavioral approach.

Discussion. The authors remark that the quality of the research design including the sampling of participants, may influence effect sizes. Stronger effects may be obtained in the least well-controlled research. They discuss the advantages of using effect size as a measure making comparisons between types of interventions possible. Clinicians should know what kind of effect size can be expected in what kind of intervention. The authors regret the costs of interventions and programs are seldom reported. They suggest program developers may overestimate the impact their interventions will have, perhaps in a need to 'sell' the program. Although in general the programs appear to be moderately effective, there is still much overlap between the compliance rates of the experimental group and the control group. In specific terms, 32% of the control groups did comply better than the average member of the experimental groups.

25
HANSEL, N.K.
Review of oral hygiene patient education.
Patient Education and Counseling; 5, 1983, no. 2, p. 89-93, 46 ref.
nivel

In this article, the author reviews empirical studies, proposals for programs and opinions on oral hygiene patient education. The review focuses on those educational methods that apply to one-to-one or small groups targets rather than large-scale programs. The studies are discussed under the headings: behavioral techniques, patient motivation, special programs, and parental role.
According to the author, the standard of dental patient education has remained relatively stable the past several decades. More recently, however, the information instruction mode has been recognized as insufficient to induce long-term oral health-care behavior changes. The problem of long-term compliance is a recurring theme in the review.
Behavioral techniques. According to the author, the effectiveness of fear as a motivational tool remains controversial. In one study it was found that a 'moderate' fear appeal with general tooth brushing was more effective than a 'strong' fear appeal. Other investigators have challenged the importance of fear. They found that highly specific oral hygiene instructions were more effective in short-term outcomes than either fear or positive appeal in a group of junior high school students. In one study, a significant improvement was found in dental behavior among children exposed to video-taped demonstrations of a peer model. Results of a second study suggest that elaborated recommendations and positive affect arousal were most effective in changing actual behavior but that high fear levels and recommendations were most effective in changing reported behavior. A third investigation had success with group discussion and group-administered desensitization for those very anxious about receiving dental treatment. In a fourth study, the effects of visual feedback were tasted using disclosing tablets after brushing and flossing. There were no significant differences between experimental and control group.
Patient motivation. A comparison between two groups on improvement on oral hygiene, the group with fee-reduction contingency demonstrated a higher level of improvement. In two studies, locus of control appeared to be correlated with certain oral health practices. In a

survey of high-school students who had received oral health education throughout elementary grades, they demonstrated a lack of fundamental knowledge on oral health. Results from a national program, involving 25.000 children in ten sites across the United States, indicated no significant effects from the educational component of the project.

Special programs. According to the author, educational programs directed toward subgroups of the population with special oral hygiene needs are increasing. A study of mentally retarded teenagers and their parents has revealed high incidence of improvement in brushing patterns and reduction of plaque after preprogram instruction, interval examinations and reinforcement. A second investigator examined the attitudes and perceptions of the elderly toward oral health and found attitudes generally positive, which may suggest, in his view, a potential for education.

Considerable attention has been given to the motivation of patients who wear dentures. In one study, dental behaviors were not significantly different among groups, receiving educational and behavioral sessions, written instructions, and no instructions. A second investigator has demonstrated that specialized instruction for wearers of removable partial dentures improved plaque scores.

Parental role. An investigator found that children's Oral Health Index was highly correlated with the mother's dental knowledge. In another project, active parental participation and contracts with parent and child tended to increase compliance and levels of hygiene among patients.

Discussion. In the view of the author, dental practitioners face a difficult challenge when attempting to modify oral hygiene habits, because there is no clear cut cause and effect relationship between the incidence of dental caries and oral regimens. Patient action must occur over a long period of time before results can be demonstrated.

Future research should move away from brushing and flossing exclusivity (on short-term) toward providing effective information and behavioral guidance in the area of fluoride usage (on long-term).

26
KANTERS, H. W.
Effectiviteit van patientenvoorlichting: een literatuuronderzoek.
(Effectiveness of Patient Education: a Literature Research.)
Bunnik: Landelijk Centrum Gezondheidsvoorlichting- en opvoeding, 1986.
129 p., 112 ref.
nivel (R 3730)

Kanters has three purposes on studying effects of patient education: a) clarifying the meaning of 'patient education' and of 'effects', b) reviewing research results on this topic, and, c) formulating recommendations for research and politics.
The study concerns six possible effects of patient education: 1. hospital residence, 2. patient compliance, 3. health status, 4. self care, 5. anxiety, 6. knowledge. This abstract is restricted to one chapter, the chapter on patient compliance.
The author describes his investigation of the literature. Most of the literature reviewed concerns the 1975-1985 period. Much attention is paid to reviews and meta-analysis.
The chapter on patient compliance covers four subjects: the problem of compliance, factors determining compliance, the influence of education on compliance, and cost-effect ratio of patient education.
The problem of compliance. Compliance is defined as: the way patient's behaviour conforms to the medical and health advice given. The author discusses some ethical problems concerning this topic. In his view influencing patient's non-compliance is not always permissible.
The magnitude of non-compliance appears to be impressive and always exceeds providers expectations. The number of patients not keeping appointments for screening or treatment varies from 16% to 90% with a mean of 50%. Those figures drop to 25% if it was not the provider but the patient himself who initiated the first contact.
Compliance in short term treatments, like finishing antibiotic treatments, usually ranges from 60% to 75%. About one third of the patients do not finish the treatment. More compliance is seen in curative treatments than with preventive treatments.
Long term treatments, as for the chronically ill, show a mean compliance rate of 50%. The author mentions the enormous differences in percentages reported ranging from 7% to 95%.
Factors influencing compliance. Research has been done on various factors assumed to influence compliance. The author discusses the

following factors: the nature of the illness, features of treatment, organization of care delivery, features of the communication, and, characteristics of the patient.

The nature and duration of the illness appear to be relatively unimportant with respect to compliance. Factors positively influencing compliance are the way the illness restricts the patient in his activities and, contrary to expectations, the less serious the illness; the more compliance there is.

Treatment features, negatively influencing compliance, are the side effects of treatment, the costs to the patient and restrictions in patient's lifestyle. Most non-compliance however stems from duration of treatment (compliance declines over time) and complexity of treatment. According to the author there is nearly a perfect relationship between the amount of different advice given and non-compliance.

In respect of the organization of care delivery, reducing waiting time, the individualization of the appointment system and enhancing continuity of care appear to enhance patient's compliance.

Communication variables affecting patient's compliance are based on Ley's research on doctor-patient communication. Information must be comprehensible and the amount of information should be restricted to facilitate memorizing. Compliance also seems better if the provider shows interest and concern in the patient and if he supervises patient's compliance.

Patient characteristics such as age, sex and social class do not seem to be related to compliance. The results show ambiguous or contradictory findings. There is some evidence that the patient's attitude and beliefs are related to compliance, derived from research into the health belief model. This model however seems to have little predictive power.

The author concludes that compliance is related to a variety of factors. Some are easy to influence and others are difficult to influence. He cautions against exaggerated expectations in gaining long-term compliance.

Effects of education on patient compliance. The effects of education on appointment keeping appears to be an increase of appointment keeping compliance ranging from 10% to 30%. Effects on short-term compliance with treatment also are demonstrated. Clear instructions can enhance compliance with 10% to 25%. Combining clear instructions with 'memory-aids' such as a medicine calendar even increases compliance from 30% to 60%. In general, it seems that the quality of

the educational approach is more important than the kind of approach.

Enhancing long-term compliance seems to be more difficult. According to the author there is a consensus about the finding that merely informing the patient has no effect on long-term compliance. There are however indications that applying a combination of methods can have long-term effects. Some methods and principles, mostly derived from psychotherapy and counseling, are discussed. The finding that behavior often relapses to pre-treatment level after stopping the intervention is disappointing.

Cost-effect ratio of patient education. With respect to the costs and effects of patient education the author mentions the risk of health damage in the case of non-compliance and, the millions of dollars wasted on medication not taken. Comparing the costs and benefits of educational activities however is a rather complex problem and research on this topic is hardly ever performed. In reviewing seven studies on this topic the author concludes there are indications of positive results for educational programs in terms of cost-benefit. In general it seems the benefits exceed the costs of the interventions. More research is needed before firm conclusions can be drawn.

Recommendations. The author formulates 13 recommendations for research and practice. We mention some. To enhance compliance, it seems not to be sufficient to merely inform patients. Information should be combined with other educational activities. The basic principles in such education are individualization, feedback and reinforcement.

There is a need for research on cost effectiveness of patient education in the Netherlands. The author cautions against simply replicating research done in other countries. Investigators should take into account the specific problem under study and the specific health care setting and structure in the Netherlands. Finally, the author recommends researchers to pay more attention to the patient's point of view in future research.

4. CHRONIC DISEASES

27
GERBER, K.E.
Compliance in the chronically ill: an introduction to the problem.
GERBER, K.E., NEHEMKIS, A.M.
Epilogue: the complex nature of compliance.
In: Gerber, K.E & Nehemkis, A.M. (eds.) Compliance: The Dilemma of the Chronically Ill. New York: Springer, 1986, p. 12-23 & 226-235.
nivel (C 2433)

In Introduction and Epilogue, the editors review literature on noncompliance in the chronically ill, with special attention to the contributions in this book. The contributions deal with: 'indirect self-destructive behavior', a cognitive-behavioral perspective, quality of survival, family relationships, elderly, staff perceptions, physician-patient communication, and societal factors.

Introduction. The author considers the terms 'compliance', 'adherence', and 'therapeutic alliance' as points along a continuum of social control. A main problem, according to the author, is the decrease of compliance rates when a regimen must be followed for longer periods. One study showed that fewer than 7% of the chronic diabetic patients fully complied with medically recommended self-care procedures. Further research has shown that diabetic patients often follow regimen procedures incorrectly. A third study showed evidence that hypertension medications are often not taken frequently enough or in the correct therapeutic dosage. A fourth study with diabetics confirms that compliance with dietary restriction in this population is poor.

Educational interventions have not, according to the author, generally improved compliance rates. Reviews of compliance literature reported, in his opinion, that compliance rates are the result of complex interactions of many differing factors. In three studies, it was stated that with the appreciation of the multifactorial determinants of compliance, much of the recent treatment literature still focuses on a simple one-dimensional approach. One study shows the failure of these approaches to maintain long-term effects. In this study it was suggested that specific treatments be developed for the unique needs of the chronically ill.

The author paraphrases Barofsky, who has argued that traditional behavioral approaches ignore the aspect of quality of life which influences compliant behavior, particularly in long-term chronic illness. (Quality of life includes the varied social, cultural, familial, economic, and phenomenological consequences of compliance.) In a study, one third of the patients was told that their nonparticipation was due to the adverse effect of treatment in their daily lives.

The author discusses the work of Cohen & Lazarus, who asserted that coping and health outcome reflects value-laden judgments about what constitutes health adaptation and 'appropriate' patient behavior. Referring to two chapters in the book, the author remarks that rather than adopting the values promoted by professional health caretakers, patients' coping patterns may have several adaptational outcomes (which may include somatic health or greater satisfaction with daily life). Personal matters may infringe more negatively on the patient's life than do the negative effects of noncompliance.

On basis of five adaptive tasks (Lazarus & Cohen), the author remarks that the process of coping with chronic illness includes a number of substantial life adjustments, only one of which directly involves compliance with medical recommendations. The author therefore espouses a multicause, multi-effect model of compliant behavior in the chronically ill.

In the **Epilogue**, the authors summarize alternative perspectives of noncompliance in the chronically ill represented in the book. Further, general and specific areas of future clinical and research efforts are suggested.

In the authors' view, one can only appreciate the meaning of the patient's response to recommendations through an understanding of the patient's value system. Consequently, no single theoretical formulation or intervention strategy will be sufficient. However, they assert that compliance literature has for too long been cluttered with the results of the nomothetic approach. As an alternative, they refer to the idiographic approach of one of the contributors to the book.

Several authors have raised the question of what therapeutic attitude should be adopted toward a patient's failure to comply. One contributor concluded that there are definable limits to the lengths that a physician need go, beyond the provision of information. Other contributors, from a cognitive-behavioral perspective, are inclined to view the failures to adhere as medical symptoms which can be

solved.
According to the authors, noncompliance has both negative and positive aspects. They discuss some positive aspects of noncompliance.
The authors view the utility of educational intervention as restricted to a few cases. For example those of the chronically ill who are constantly given information about their condition, and yet still show high rates of non-adherence.
The authors consider the notion that compliance is a complex, multi-determined phenomenon as the major theme of the book. They assert that comprehensive research which analyzes the interaction of these separate factors is lacking. Without such analysis, interventions are difficult to design, in their view. Further, the multiplicity of factors reinforces the necessity of individualizing treatment, which is an important issue for future research and clinical effort. Another area of future investigation is that of the impact of the family on coping with chronic illness.
Finally, the authors believe that the greater understanding of compliance must include an appreciation of moral questions. The dilemma of the chronically ill individual is a moral one: the complex determination of how individuals should live, given the unique circumstances of their lives.

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HOLROYD, K.A., CREER, T.L. (eds.)
Self-Management of Chronic Disease: Handbook of Clinical Interventions and Research.
Orlando etc.: Academic Press, 1986.
ruu

This book is divided into three parts. The first examines recent developments in health education and social learning theory that have served as guidelines for establishing self-management programs. Part two focuses on the self-management of health behaviors and health risk. Part three focuses on the self-management of eight chronic diseases. The division of this abstract will be somewhat different, as a result of the decision to review only parts of the book which deal with compliance and self-management. First, the social learning theoretical framework of the book will be discussed. Second, a chapter specific discussing compliance will be discussed.

Third, parts, dealing with compliance, of chapters on drinking, exercise, and diabetes will be discussed.

Social learning theory. According to the authors (D.L. Tobin, R.V. Reynolds, K.A. Holroyd & T.L. Creer) self-management has its roots in behavior therapy, in which the original techniques of rewards and punishment were replaced by coping skills training. Self-management skills include: self-monitoring, self-instruction, self-induced stimulus change (change of environmental conditions), self-induced response change (change of behavior to reinforcement or punishment responses), relaxation, and decision making. Social learning theory suggests that self-control behaviors are affected by the reciprocating interaction of the environmental, behavioral, somatic, and cognitive dimensions of the self.
Compliance is defined as 'the adherence to a self-imposed rule set regarding the performance of self-control behavior'. The authors assume that the impact of clinician and client behavior, cognitive processes, and the management of side-effects are important to patient compliance. Accordingly, promoting compliance should be a natural part of self-management program development, in their view.

In their chapter on the **facilitation of compliance** with medical interventions, M.A. Southam & J. Dunbar argue that the growing appreciation of long-term compliance has led to an interest in behavioral self-management. They discuss the compliance improving methods of self-monitoring, contingency management, stimulus control, and problem solving, including self-regulation and medication. On the basis of three studies, the authors conclude the efficacy of **self-monitoring** as a single compliance-enhancing technique is not consistently supported. Neither has self-monitoring provided consistent improvements with therapeutical outcome of blood pressure control and with blood glucose monitoring.
The authors discuss the pros and cons of self-monitoring. A negative point is that self-monitoring requires the patient to be trained in recording. On the positive side, patients report a better understanding of their disease. The authors recommend to investigate the elements that make self-monitoring effective with certain diseases but not with others.
Contingency management includes goal setting, contracting, reinforcement, and response-cost condition. The authors consider goal setting as an useful component of management. They found no research

conducted on the efficacy of goal setting. Several studies demonstrated that contingency contracting, in combination with other self-management techniques, improved compliance rates. The authors regard reinforcement techniques to improve compliance as successful in a wide range of medical regimens (most studies used point systems or token economy). Although self-reinforcers have not been investigated, they consider them to fit into self-management well. A response-cost condition is a method whereby there is cost to the patient for noncompliance. Improvement was observed in one study.

Stimulus control includes: cueing strategies, and self-talk. Cueing strategies have been implemented particularly with pill taking. The authors argue that simple reminders can be cost-effective components of self-management strategies. They consider self talk, although no studies have been performed, able to improve the performance of desired self-control behaviors.

Although skills for **problem solving** have not been reported in literature, the authors regard the only approach of problem solving as time-consuming and not appropriate for all patients. A few studies have the reported positive compliance effects of giving patients greater control in regulating their medication.

Combination of strategies. The specific methods discussed previously have generally been incorporated into various combinations. According to the authors, single strategies have been found less effective when compared with combination strategies.

Conclusion. The authors conclude that increased knowledge is not a sufficient outcome for self-management. The training of self-management skills is necessary for the success of self-management too. The authors recommend clinicians, first, to consider patients' physical capacity to carry out the required procedures. Second, to select self-management strategies specific to the patient and his problems. And third, to regard shared responsibility, and acceptability of the procedures as important factors in offering the program.

Compliance with specific chronic diseases.

In the chapter on **problem drinking**, W.H. George & G.A. Marlatt discuss relapse prevention in the self-management of alcohol use. They define relapse as a violation of a self-imposed rule. According to the authors, if the individual is able to execute an effective coping response in a high risk relapse situation, then the probability of relapse diminishes. They propose two treatment procedures: teaching individuals to (1) cope with high risk situations and (2)

to identify and respond to early warning situations. Most of the attention in this chapter is devoted to the presentation of a comprehensive self-management program based on the authors work on relapse prevention.

P.M. Dubbert, J.E. Martin & L.H. Epstein discuss the application of self-management to **exercise** adherence, in aerobic exercise programs in particular. They evaluate behavioral and cognitive approaches. According to the authors, half of the participants in exercise programs drop out by 3-6 months. They view program attendance as the most reliable measure. However, they note that some exercise sessions are performed at home. Accordingly, fitness indicators should be used too. The authors found few experimental studies of determinants of non-adherence; most studies were retrospective and correlational. They divide determinants into subject factors, social and environmental factors, and exercise program factors. The authors conclude on basis of their review that the most critical factors characterizing the high-risk dropouts consist of poor self-motivation, no active spouse support, an inconvenient exercise facility, and exercise consisting of individual high-intensity activity with little or no support and/or reinforcement during or after the exercise.

The authors conclude that studies of exercise-adherence modification suggest that reinforcement control, stimulus control, and especially self- or cognitive control procedures can lead to considerable improvements. The authors regard these studies as preliminary because of their lack of replication, the small number of subjects, select samples, and inadequate long-term follow up.

The authors provide clinical guides for planning exercise self-management.

D.J. Cox, L. Gonder-Frederick, S. Pohl & J.W. Pennebaker devote in their chapter on diabetes a paragraph to adherence. First, they discuss studies of personality and patient education. On basis of the literature, they conclude that health education alone is not sufficient for long-term adherence. And they conclude that the view that problematic personality characteristics are the primary cause of non-adherence has not been supported.

The authors discuss a social learning model that includes the role of health beliefs and social support. On basis of their review, they state that while there is no broad empirical base, assessment of patient health beliefs might be useful in identifying potential self-management problems. Further, assessment should be made to

identify barriers to self-treatment presented by family members, other significant people, and work site colleagues.
Attempts to enhance adherence, according to the authors, are hampered by the lack of understanding concerning interaction between the relevant variables. A greater understanding and management of diabetes will progress, in their view, only with collaboration among medical and behavioral professionals. They regard this as a challenge for behavioral medicine.

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EPSTEIN, L.H., CLUSS, P.A.
A behavioral medicine perspective on adherence to long-term medical regimens.
Journal of Consulting and Clinical Psychology; 50, 1982, no. 6, p. 950-971, 64 ref.
nivel (C 2405)

The authors review studies investigating the use of behavioral procedures to alter medication compliance in chronic disorders. After discussing definitional issues and the range of compliance, they review methods of measurement, behavioral medicine approaches, the relation between adherence and clinical outcome, and future compliance research.
Measurement. The authors discuss the advantages and disadvantages of indirect methods, such as self-report, therapeutic outcome, physician estimate, pill count, and mechanical methods; and direct methods such as blood/serum assays, urine assay, tracer and marker methods. The authors conclude that the clinician or researcher must choose a method considering practicality and validity.
Behavioral approaches are, according to the authors, among the most effective methods available for improving adherence for chronic diseases. They divide the approaches into: stimulus-control techniques, reinforcement control techniques, and self-control techniques. The authors remark that the studies are difficult to compare as a result of different methodological procedures.
On basis of their review, the authors conclude that **feedback of drug levels in serum** proved to be successful with asthmatics and epileptics. It resulted in both increases in medication-compliance and decreases in symptoms. However, only one study was a randomized controlled study, and the investigation had substantial loss to

follow-up and a possible confound of treatment improvement by having more older patients in the experimental group. They conclude, however, when available, drug feedback has a major advantage of being a very simple and cost-effective treatment to implement.

Reinforcement for medication use was reported effective in two studies and not effective in one. However, the positive studies both had methodological difficulties. Reinforcement for symptom control was shown to be responsible for improved day-to-day control in insulin-dependent diabetic children and possibly responsible for improvement in adult hypertensives. Reinforcing blood pressure reduction in the hypertensives was one part of a multicomponent treatment package used. Independent testing of two of the stronger components - self-monitoring of symptoms and increased supervision- were not revealed as important in influencing control. The authors infer that reinforcement for symptom reduction was important.

Self-monitoring of symptoms had little effect on adherence of hypertensives in one study. Self-monitoring of medication showed equally small effects, with one positive study showing improvements in inpatient geriatric patients over a short 2-week period, compared to a control, but with only minimally better effects than a detailed instruction card.

On basis of these results of behavioral interventions, the authors conclude that self-monitoring approaches are less effective than reinforcement or feedback approaches.

Adherence and clinical outcome. Although it is commonly believed that adherence has effects on clinical outcome, the authors conclude the following on basis of four studies: (1) improving adherence will not result in all adhering patients achieving control of their disease, and (2) outcome measures cannot be used to estimate levels of adherence.

Examination of controlled trials that measure both adherence and response to drug or placebo showed the following results in a coronary drug project. As expected, patients who adhered to the drugs had fewer deaths. However, unexpected, patients who adhered to a placebo also had fewer deaths than non-adherers. A second study showed that schizophrenics who adhere to either medication or placebo showed lower relapse rates than schizophrenics who did not adhere to their prescribed dosage. The authors conclude on basis of these two studies that main effects of adherence have been demonstrated. A third study of chlorpromazine medication reported that by 2 year 80 % of placebo patients had relapsed, whereas only 48 % of

the drugtreated patients suffered a relapse. The authors conclude that adherence itself is not enough to protect patients against relapse.

Future research. The authors consider the measurement of long-term adherence a major limitation to present controlled studies. Contrary to the common belief that adherence decreases over time, they refer to a case of gradual increase in outcome over 5 years probably due to improved adherence.

A second drawback in theoretical development is the relative absence of any basic research. The authors regard the majority of clinical compliance research as a theoretical, with the major goal being the technological solution of specific compliance problems. They propose considering the psychological habit literature to guide basic research. Pill-taking and smoking are examples of such habits.

A third problem to be solved is the development of a common method for measuring adherence in a wide variety of problems.

Fourth, the finding of two studies that adherence had an independent statistical effect on clinical outcome, demands an explanation. Further, the identification of effective clinical procedures would clear compliance research. Normally, poor clinical response is attributed to poor compliance. The authors suggest a more direct assessment of pharmacological treatment effects. They conclude that the contribution of compliance research is to improve the clinical response of patients to effective pharmacological treatments.

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HAYNES, R.B., WANG, E., MOTA GOMES, M. DA

A critical review of interventions to improve compliance with prescribed medications.

Patient Education and Counseling; 10, 1987, no. 2, p. 155-166, 31 ref.

nivel

This review examines investigations testing strategies intended to improve patient compliance with prescribed medications. The authors' purpose was to select the most scientifically sound studies, published in the last ten years. They comment on these in the light of the progress of knowledge and the future needs for research.

Articles were acquired from Medline, Science Citation Index and bibliographies. Studies were selected that met seven methodological standards (among others; sample, control group, randomization, follow-up study). 17 studies were selected, including: 12 articles

on hypertension, 3 on streptococcal prophylaxis, and single articles on asthma and epilepsy. The authors divided the intervention studies into: short-term treatment and long-term treatment.

Short-term interventions. Only two studies in this category met all standards. In one study of pediatric patients it was found that special instruction (emphasizing the need for a full course of treatment) showed superior results to usual instruction in medication compliance. The other study reported that compliance with medication can be increased by decreasing the frequency of dosing to once or twice a day.

Long-term treatment. Fifteen investigations met the standards. On basis of eight studies, the author conclude that the following interventions applied in isolation failed to enhance compliance: self-monitoring, home visits, tangible rewards, peer group discussion, counseling by a health educator or nurse, and special unit dose 'reminder' pill packaging. The authors argue that long-term compliance requires combinations of interventions.

The authors regard cues and rewards the most consistently effective part in the ten selected combinations interventions. Some combination intervention studies are discussed. The results of a combination of counseling, group discussion and home visits, were individually unimpressive, but, in group population, the combination resulted in statistically significant improvement in compliance and treatment outcomes. A program of group discussions, self-monitoring and self-management reported positive results. The authors question, however, the practicability and the staff time involved. A study of a combination of maneuvers among epileptic patients, including self-monitoring, medication container and mailed reminders increased the proportion of prescription refills.

Conclusion. The authors conclude that after two decades of intervention testing, the list of practical strategies is still short. They present a list of compliance improving actions that have been shown to work. For all regimens, they regard simple prescriptions and clear instructions as working. For long-term regimens, reminders, rewards and social support work.

Discussion. The authors argue that although considerable knowledge is gained on compliance, many methods of improving compliance fall short in terms of ease of application and effectiveness. In their view, the majority of high quality studies were published in the 1977-1981 period, with good studies since then being few and far between.

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DOLAN MULLEN, P., GREEN, L.W., PERSINGER, G.S.
Clinical trials of patient education for chronic conditions: a comparative meta-analysis of intervention types.
Preventive Medicine; 1985, 14, p. 753-781.
nivel (C 2443)

In this article the authors quantify the cumulative meaning of clinical studies on interventions to improve knowledge, adherence, and clinical outcomes in patients with chronic conditions. Their purpose is to investigate what type of educational intervention is most effective. The technique of meta-analysis is used to quantify and compare the effects of the interventions.
The authors have found 500 titles on educational interventions in chronic conditions. On the base of methodological rigor they selected 70 studies for their meta-analysis. These studies are on hypertension, diabetes, mental problems, asthma, cardiac conditions, and some other diseases.
The authors rated both the methodological quality of each study and the educational quality of the intervention. These ratings were used to investigate their relation with out-come measures.
Meta-analysis. In meta-analysis the effect of an outcome is expressed in an estimated effect-size (ES). An effect-size is computed by taking the difference between the mean score of the experimental group and the mean score of the control group. This difference is divided by the standard deviation of the control group. An effect-size of 0,5 means the scores of the experimental group are a half standard deviation higher than the scores of the control group. A simple way to evaluate ES-values is thus: 0.2 is small, 0.5 is moderate, and 0.8 is large (and rare).
Quality of research methods. The quality of the study-designs were rated using the Sackett and Haynes coding system. This scheme considers six elements: 1) the degree of assurance of internal validity, 2) appropriateness of sample selection and thoroughness in describing the sample, 3) completeness of specification of the illness or condition, 4) completeness of description of the therapeutic regimen, 5) replicability of the standards of adherence, and 6) quality of the measurement instruments and procedures used.
The results show the quality of the study designs varies widely and the authors state there is a considerable room for the improvement of study designs. Inadequacies concern for example failures in

adequate description of sampling procedures, diagnostic criteria and treatment regimen. The measure of the dependent variable (adherence) yields a problem because some investigators require perfect agreement with the regimen while others allow a deviation of 20%. Such discrepancy makes comparison among studies difficult.

The most common measures of adherence to the regimen were pill-counts and prescription refills (n=36). Twelve studies depended solely on self-report. The remaining studies used more than one measure of adherence.

Quality of the educational intervention. The interventions were rated according to educational principles based on a rating scheme adapted from Neufeld. The criteria of this scheme are: consonance, relevance, individualization, feedback, reinforcement and facilitation.

Consonance, that is the degree to which an intervention was directed toward effecting the intended outcome. Nearly all the interventions appeared to match this criterion.

Relevance: the degree to which the educational program appeared to be geared to the knowledge, reading level, visual acuity, beliefs, circumstances and prior experience of the learners. Less than half of the interventions applied those principles.

Individualization: more than half of the experimental treatments could be characterized as explicitly providing for individualization (11 studies could not be rated).

Feedback: this criterion was met in 30 studies, 21 studies applied it incidentally and, 4 made no provision for feedback and in 15 studies application of feedback could not be rated.

Reinforcement: just 28 of the studies could be rated on this criterion, and less than one-third (n=22) applied it explicitly.

Facilitation: the degree to which the regimen was adjusted to patient's specific circumstances or to which barriers in adherence were reduced. More than a third of studies (n=27) facilitated adherence in some way, in one-third (n=23) there was some incidental application, and in the remainder, facilitation could not be discerned.

As a final criterion, the authors assessed whether a **combination** of educational methods had been used, because this approach is usually more effective than one single approach. Well over half of the interventions (n=43) incorporated two or more methods.

Comparison of educational methods: effects on knowledge. In the 27 seven studies measuring knowledge as dependent variable, six educa-

tional strategy types could be distinguished. The effect-sizes of these strategies were computed. All but one strategy appeared to be effective, as is indicated by high values of effect size. Effective strategies are: one-to-one counseling, group education, counseling or group education plus materials. Behavior modification, and providing written or audiovisual information showed somewhat lower but nevertheless strong ES-values. One method, using patient package inserts, had no effect on patient knowledge.

A least squares analysis was performed to investigate the influence of other variables on effect-size. The results indicate that the quality of the educational intervention strongly influences effect-size. The higher the quality rating of the intervention, the larger the effect on patient's knowledge, regardless of the type of intervention strategy. The quality of the research design has the reverse effect: the lower the quality of the design, the larger the reported effects on knowledge.

Comparison of educational methods: effects on drug utilization. In the 55 studies using drug utilization as dependent variable, 8 intervention strategies were distinguished. The ES values on drug utilization appear to be lower compared with ES values on knowledge. Nevertheless the effect-sizes are in the strong-middle range for all the applied strategies with the method of using patient package inserts as an exception again. Behavior modification and a multi-method approach achieve the highest ES-values, but they do not differ significantly from the other approaches.

Again, the least squares analysis indicate the quality of the educational intervention has considerable effects on effect-size values, regardless of type of intervention. As with knowledge, once again bad research designs yield high effect-sizes for adherence figures.

Discussion. The authors conclude their analysis indicates that patient drug information and education can achieve impressive gains in knowledge and reduction of drug errors. The overall rating of strategy according to seven educational principles appears to be the most powerful predictor of effect-size. The most strongest predictors in this respect were individualization of the education, explicit feedback on learning or clinical progress and reinforcement to reward the desired behavior.

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MAZUCCA, S.A.
Does patient education in chronic disease have therapeutic value?
Journal of Chronic Diseases; 1982, 35, p. 521-529, 42 ref.
nivel (C 2442)

This article concerns the degree to which education improves the course of chronic disease. The purpose of the author is to investigate whether patient education can influence patient compliance with treatment regimens, physiological progress toward a therapeutic goal, and long range health outcomes. The author examines the differential effects of an 'educational approach' and a 'behavioral approach'. The technique of meta-analysis is used to assess the magnitude of experimental effects making the comparison of different research results possible.

Four criteria were used in selecting the literature: the study must concern a chronic medical problem and the independent and dependent variables must meet some specific criteria. Only experiments with control group were included.

Investigation of the literature identified approximately 320 articles. Only 30 studies met all the criteria. These were included in the meta-analysis. The chronic conditions were hypertension, other heart disease, asthma, obesity and some other diseases.

Meta-analysis. In meta-analysis the effect of an intervention is expressed in an estimated effect-size (ES). An effect-size is computed by taking the difference between the mean score of the experimental group and the mean score of the control group. This difference is divided by the standard deviation of the control group.

Quality of study design. Of the 30 studies selected, 24 used some form of randomization to assign subjects to treatment and control groups. The effect sizes calculated from randomized studies however did not differ as a whole from the non-randomized studies.

Effects of patient education. Eighteen studies were directed at improving regimen compliance. The mean change in compliance, attributed to patient education is an effect size of .67. Calculated effect sizes range from -.12 to 1.68, but these figures form exceptions.

Thirteen studies investigated the effect of education on the therapeutic progress of the patient. The mean effect size of these studies is .49.

Changes in long term outcome of the chronic disease are more difficult to obtain as is indicated by the mean effect size of .20. The author points to the fact that the more the intervention is removed from the intended effect the smaller are the effect sizes. For example education may directly intend to change compliance behavior but may only indirectly intend to improve patient's health.

Differential effects of educational approaches. Two educational approaches are distinguished, the didactic and the behavioral approach. The didactic approaches only yielded a mean effect size of .17. In contrast, the behavioral approaches showed a mean effect size of .77. A breakdown analysis of all variables included indicate the striking superiority of the behavioral approach. This holds both for patient's compliance with the regimen and for the therapeutic progress and health outcome. Didactic approaches appear to have only very little effect.

Discussion. The author discusses the clinical significance of his findings. The effect sizes found in behavioral approaches mean that the average patient in the experimental group will demonstrate a physiological response to therapy better than 78% of control patients. In contrast, patients receiving didactic education show more improvement than only 57% of the control group patients. The author recommends investigators and clinicians to calculate effect sizes of their interventions to gain more insight in the effects of their educational activities.

Health professionals should realize that behavioral approaches have therapeutic value. Interventions that appeared to be successful in the analysis included: regular contact with the same health care professional, control over stimuli and rewards for progress, establishment of mnemonic systems, and, daily self care rituals.

33
DEYO, R.A.
Compliance with therapeutic regimens in arthritis: issues, current status, and a future agenda.
Seminars in Arthritis and Rheumatism; 12, 1982, no. 2, p. 233-244, 55 ref.
nivel (C 2436)

In this article, the literature on compliance with medications and physical therapy for arthritis is reviewed. Reports from the standard medical literature dealing with therapeutic compliance among arthritis patients were identified from the bibliography of Haynes et al., bibliographies from the National Clearinghouse for Arthritis and a search of literature through 1981 via Medline.

Medication compliance. The studies reviewed show that compliance of rheumatoid arthritis patients ranges from 51 to 78% of the patients. The author notes that two studies reported considerable variation in compliance depending on the identity of the drug prescribed. Two studies reported compliance by age and sex, one reported compliance by matrimonial status. None of these demographic features were associated with differences in compliance. One study of compliance showed there were no differences due to the number of arthritis medications taken, number of doses/tablets per day, or number of overall drugs. Another investigator also concluded from his study that regimen complexity was a relatively minor determinant of compliance.

In the author's view, characteristics of the disease process itself may influence compliance. In one study it was found that compliant rheumatoid patients generally had more case of the severe disease than non-compliant patients. In accordance with a second study, the duration of rheumatoid arthritis does not appear to correlate with compliance among adults. A third study of juvenile rheumatoid arthritis showed that compliance was lower among patients with fewer clinic visits. A fourth study reported that appointment-keeping compliance and medication compliance are at last moderately correlated. In a fifth study, it was found that patients had different therapeutic expectations from physician, which, in the author's view may influence compliance. He discusses two studies, reporting correlates patient's knowledge about their disease and medications and compliance. Finally, one study found that compliance was correlated to perceived time waiting and time spent with the physician,

and to the degree to which the relationship was seen as 'personal'.

Physical therapy. According to the author, the percentages of compliance in these studies range from 34% to 62%. In one study it was found that 78% of the patients complied with aspirin, 40% with exercise, and 25% with splint use. Two studies showed no correlations between disease severity and physiotherapy compliance. In the author's opinion, studies of the type or number of instruction sessions gave conflicting results. Family expectations were in one study found to be associated with splint compliance.

Discussion. The author asserts that nearly all studies summarized in the tables were cross-sectional surveys of patients seen in hospital-based clinics. Patient self-report and physician estimate were by far the most common measures of compliance. Definitions of compliance varied considerably. And most studies examined correlates of compliance behavior.

Recommendations. The author concludes that the value of future research is partly predicated on studies of clinical efficacy, which should indicate where compliance is most important. Secondly, actual studies should be designed with validity and generalization in mind. Studies which examine possible correlates should search for stronger, more easily measurable predictive variables, which are amenable to change. Thirdly, studies of lay explanatory models should be encouraged, and analysis should emphasize the identification of independent variables.

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BELCON, C., HAYNES, R.B., TUGWELL, P.

A critical review of compliance studies in rheumatoid arthritis.

Arthritis and Rheumatism; 27, 1984, no. 11, p. 1227-1233, 31 ref.

nivel (C 2403)

In this review, nineteen studies of treatment compliance in rheumatoid arthritis (RA) patients have been appraised to assess the magnitude and determinants of noncompliance in this population. A MEDLINE computer cross-reference search of English biomedical literature, linking compliance to RA was performed for reports published during the years 1962-1971. Nineteen articles met the six criteria of the authors. Eighteen articles investigated the magnitude and the determinants of compliance and one evaluated a strategy to increase compliance.

Results. Eight studies investigated the relationship between **drug therapy** and patient compliance in RA. Two of these noted a negative correlation between duration of therapy and compliance. In one of the few long-term studies, the percentages of dropouts over a 52-week period of observation were 100% (within four weeks) for the placebo group, 57% for flubiprofen, and 84% for enteric-coated ASA. According to the authors, this study represents one of the few randomized control trials investigations. Another study, investigating the effect of duration of therapy on compliance, reported a 33% 2-year compliance rate for RA patients receiving azathioprine.

Drug complexity and compliance was probed in two studies. In one study, using pharmacy refills as a compliance measure, a negative correlation between drug complexity and compliance was observed. In the other study, no correlation between compliance and drug complexity was noted, nor was dose frequency found to be related to compliance. In a next study, 35% of evaluable patients were compliant according to a urine marker, while 51% were by pill count. In the study discussed last, it was reported that the number of pills taken per day was found to be negatively correlated with compliance.

Three studies have investigated the relationship between **disease severity** and compliance. The authors believe that the lack of details in the selection procedures and lack of explicit definitions preclude firm conclusions.

Physiotherapy. Two cross-sectional studies, involving a mix of rheumatic disease patients, estimated the compliance rate for patients of self-administered home physiotherapy to be 39% and 65%. According to the authors, methodological inconsistencies may explain the discrepancy in compliance rates. A third study reported that length of illness, frequency of clinic visits, and presence of side effects, did not influence compliance. Unlike another study, belief in the benefit of the therapy was found to influence compliance positively. A fourth investigation into the effects of visual feedback on compliance with completion of hand exercises, reported an increase in compliance following the introduction of the experimental maneuver.

Splint usage. According to the authors, all five studies of compliance with splint-wearing used some form of patient interview, lacked details on sample selection, and none fully explained the prescribed regimens for wearing splints. The compliance rates were determined to be 25%, 28%, 50%, 62%, and 65%. The only methodologi-

cal sound study reported a rate of 62%. In a last miscellaneous study, it was found among patients who admitted having experienced pain or discomfort from treatment, that 47% were fully compliant, whereas 55% of those who did not experience these effects were fully compliant.

Discussion. The authors regard it particularly disturbing that among 19 investigations, only one can be considered a true randomized control trial. Further, many of the longitudinal studies have failed to assemble an inception cohort. In their view, these studies may well have excluded the most non-compliant patients. Many studies failed to define compliance, list the disease diagnostic criteria, or detail the regimen administered. The validity of such studies can not be assessed and they can not be replicated.

Strategies to improve compliance among RA populations are virtually nonexistent, according to the authors. Accordingly, in the interim, clinicians and researchers may need to resort to strategies employed in other chronic diseases. In the long run, there is a need to replicate these studies among RA patients to determine whether their results are applicable.

35

BRADLEY, L.A., YOUNG, L.D., ANDERSON, K.O., McDANIEL, L.K., TURNER, R.A., AGULDELO, C.A.

Psychological approaches to the management of arthritis pain.

Social Science & Medicine; 19, 1984, no. 12, p. 1353-1360, 30 ref.

nivel

This review examines the literature regarding the efficacy of cognitive-behavioral and other self-control interventions by rheumatologists and psychologists in helping arthritis patients reduce their pain and functional disabilities. This is followed by a description of a research program on the outcomes produced by a biofeedback-assisted, cognitive-behavioral group therapy. According to the authors, the goal of all self-control pain management programs, including cognitive-behavioral interventions, is to teach the patient to recognize and alter the association between certain stimuli and pain.

Rheumatoid arthritis. One study examined the efficacy of hand temperature biofeedback and relaxation training. The results showed that patients receiving both were unable to consistently increase

skin temperature, although they showed an increase in pain tolerance and a decrease in the time necessary to complete a 50-ft walk. There was no follow-up assessment. In a second controlled study, rheumatoid arthritis patients were provided with relaxation-sessions, finger temperature feedback, home exercise training and education concerning posture. Experimental and control groups showed significant changes in 50-ft walking-time and performance. Only the experimental group showed positive changes with respect to night time awakenings, number of joints involved, physical activity and pain intensity. This study, according to the authors, also failed to show that changes were maintained over an extended period. In a third study, the effects of a cognitive-behavioral intervention were compared with social support intervention and with a no-treatment control condition. The first condition produced relatively positive changes with regard to patient's report of daily work, leisure, social and functional activities. The 8-week follow-up was in the authors view not sufficient to ensure long-term stability.

Arthritis secondary to haemophilia. In one study, the use of a protocol, including among others relaxation training, meditative breathing exercises and imagery training, showed that the patients decreased their experience of chronic pain, and use of analgesic medication. These changes were maintained across follow-up periods ranging from 7 to 14 months. A second case study reported similar results.

Program. The authors discuss at length a study of the effects of two interventions, including (a) a biofeedback-assisted , cognitive-behavioral group therapy, and (b) social support group program. According to the authors, this study features several methodological improvements relative to the previous studies reviewed. In their view, the results indicated that only the cognitive-behavioral approach produced consistent decrease in patients' pain behavior, morning stiffness and functional disabilities.

Conclusions. The authors conclude that the collaboration between rheumatologists and psychologists in the studies reviewed has produced several promising results concerning the efficacy of various self-control interventions in helping arthritis patients better cope with pain and reduce their functional disabilities. They advise future researchers to demonstrate that self-control techniques produce reliable outcomes among large numbers of patients over extended periods of time.

36
WATTS, F.N.
Behavioral aspects of the management of diabetes mellitus: education, self-care and metabolic control.
Behavioral Research & Therapy; 1980, 18, p. 171-180, 60 ref.
nivel (C 2401)

This review of behavioral aspects of the control of diabetes focuses on three dependent variables: (1) knowledge about disease and its treatment, (2) self-care and compliance with the treatment programma, and (3) the level of metabolic control achieved by the patient.
1. **Knowledge.** Five studies reported that patients are disturbingly ignorant about the disease and the management of the disease. Another study revealed that patients remembered only 40% of the information given on management. Patients who had diabetes for longer time were more likely to remember the information.
In a review of diabetic education programmes, it was concluded that they significantly improve knowledge but fail to affect metabolic control. A study of a educational programme related to social support and a study of automated teaching programmes revealed the same conclusions.
2. **Self care.** According to the author, there have been repeated reports that diabetic patient's level of self-care leaves a great deal to be desired. The collection of accurate data presents a problem in his view, because patients are unlikely to admit to the physicians how negligent they have been. One study reported that 8% of patients administered insulin in an unhygienic and unacceptable way; 58% of the patients administered the wrong dosage; 77% tested their urine incorrectly; 75% were not eating the prescribed foods, and 75% were not eating with satisfactory regularity.
On basis of three other reports, the author concludes that there is a minor group of patients who deliberately interfere with the proper management of their condition. The use of overdoses of insulin in suicide attempts have also been reported. According to the author, most of such patients reported in literature seem to be under 25, to be regarded as immature and to have failed to make a satisfactory, independent social adjustment.
According to the author, the majority of studies that have examined the correlation between knowledge and compliance in medicine have not found the two significantly correlated. In the author's view, health belief is an important factor. Currently, very little is

known about health beliefs and their association with the level of self-care. In one study, 23% of the patients who were aware of possible problems arising from the disease in the future, but who thought they would personally escape them, seemed to be very well motivated to manage their condition carefully. On basis of the literature, the author concludes that in this case, a coping set is the most helpful. Other relevant factors, in his view, are the effects of closer monitoring and supervision of self-care. In general, closer supervision has been found to be associated with better compliance.

3. **Metabolic control.** On basis of several studies, the author concludes that emotional factors have an important role in the control of diabetics. The author regards evidence of two kinds: effects of emotional stress on metabolic states, and general differences in emotional adjustment between well controlled and poorly controlled diabetics.

The preliminary results of an intensive training programme to achieve tight control, by monitoring their blood sugar levels and adjust food and insulin properly, showed improved metabolic control. A second study reported encouraging results from supportive counseling of poorly controlled diabetics.

Discussion. The author argues that attention to one factor alone is not sufficient in the investigation of self-care and compliance. Education may be in his view one of the less important determinants of self-care. He pleads for a multifaceted programme. A further complication is that the relative importance of different factors will vary from patient to patient. The best results will be obtained, he writes, when the source of the problem is clearly identified in a particular patient and appropriate measures taken. He regards the application of a routine programme without such a prior analysis of the problem inefficient and ineffective.

The author recommends among other things using two methods of improving standards of self-care that might be more effective than the traditional education programmes: an analysis of relevant health beliefs and the use of established attitude change procedure to modify them, and the application of behavioral methods of self-monitoring and self-regulation. Further attention needs to be given to training patients to predict the consequences for their metabolic control of various factors. According to the author, behavioral medicine can make a contribution, not to the management but to the prevention of diabetes mellitus.

37
ROSENSTOCK, I.M.
Understanding and enhancing patient compliance with diabetic regimens.
Diabetes Care; 8, 1985, no. 6, p. 610-618, 42 ref.
nivel (C 2441)

In this review, a comprehensive conceptual framework for explaining compliance with regimens for the management of diabetes is presented. The conceptual framework is the health belief model, expanded to include perceived self-efficacy, a key concept of social learning theory. The author approaches the problem noncompliance in terms of a general set of learning principles, based on the health belief model and social learning theory. According to these principles: learning proceeds best when it occurs in an incremental manner, that behaviors need to be reinforced if they are to become habitual, that much of behavior is of habitual nature and resistant to change, and that learning new behavior includes both a knowledge and a skill component.

Magnitude. On basis of several studies the author concludes that compliance with diabetic regimens may be poorer than with regimens for other conditions. He considers this lower compliance a result of the diabetic regimens which is complex, of life-long duration, and requires many behavior changes on part of the patient.

Determinants. On basis of the literature the author summarizes factors that correlate with compliance. No consistent correlations were found between compliance and: age, sex, education, income, personality type, intelligence, and general knowledge about health. Compliance was found positively correlated to: occurrence of symptoms, continuity of care, social support, beliefs about threat to health, beliefs about efficacy of recommended action, and knowledge of the nature and rationale of the regimen.

Improving compliance. The author classifies compliance improving strategies into: strategies directed toward modifying the health care system, strategies directed toward influencing the provider care, and strategies directed toward influencing the patient. At the system level these include simplifying the regimen and providing continued monitoring and continuity of care. At the level of the provider, recommended modifications include incorporating a compliance-oriented history into the medical history and becoming more aware of and attentive to patients' educational needs as well as medical needs. At the level of the patient, a number of strategies

are proposed, including provision of needed information about the regimen and modifying health-related beliefs and attitudes through contracting, social support and other modes of reinforcing compliant behavior.

Finally the relapse model is described. This model is relatively new approach to maintaining long-term compliance, which entails the patient's identifying high-risk situations for relapse and learning coping skills to deal with them.

Conclusion. The author concludes that the models described constitute a comprehensive conceptual scheme for understanding noncompliance with regimens for the management of diabetes and, with the aid of various behavioral interventions, for increasing both short- and long-term compliance. And he considers considerable research evidence supports this comprehensive conceptual framework.

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HAYNES, R.B., MATTSON, M.E., CHOBONIAN, A.V., DUNBAR, J.M., ENGEBRETSON, T.O., GARRITY, T.F. LEVENTHAL, H., LEVINE, R.J., LEVY, R.L.
Management of patient compliance in the treatment of hypertension.
Hypertension; 4 1982, no. 3, p. 415-423, 107 ref.
nivel (C 2430)

In this article, the authors review: the theoretical foundation of compliance behavior; methods of measuring compliance; approaches to managing compliance; and ethical considerations. The purpose is to review current developments in compliance as seen by an interdisciplinary group of clinicians and researchers (see list of authors).

Theories. Early theories, in their view, related compliance to easily tested characteristics of patients or their social environments. Empirical testing failed to reveal consistent relationships between these variables and compliance. Studies on 'situational variables' were somewhat more fruitful but still failed to explain more than a fraction of the problems. The authors express their opinions on contemporary models shortly. Educational strategies, according to the authors, appear to have merit for short-term treatments but has very limited value for chronic disease regimens. Tests of the health belief model showed that it does have practical value for at least preventive and short-term actions but that the magnitude of its predictive value is modest at best. The emotional drive model (which attempts to achieve compliance through informa-

tion about the illness to which is added some form of motivational appeal) is corroborated by once-only or short-term compliance; threats and fear arousal appear to have little long-term influence. The authors see the social learning model as a broad frame of reference that encompasses rather than competes with the models mentioned earlier. The authors view the self-regulation model as promising for both understanding and modifying a person's compliance, but it has had only preliminary empirical testing in the health sphere.

Measurement. The authors note the following on different methods of assessment: Monitoring attendance is not a substitute for medical compliance as about one-third of the patients who remain in care fail to follow the prescribed treatment. Clinical judgement cannot reliably predict the compliance of their patients. Patient self-reports tend to overestimate the amount of medication they are taking. Pill counts in general give higher estimates of compliance than biological assays, and lower compliance than patient-self-reports. The interpretations of drug-level measurement is subject to the foibles of individual variation in drug absorption, metabolism, and excretion. In contrast to direct measurement of drug levels, the biological effects of drugs have not been found to correlate well with compliance. According to the authors are all methods of assessing patient compliance susceptible to 'reactivity', that is, if patients become aware of the purpose of the assessment, they may alter their compliance.

Improving compliance. The authors make the following statements on strategies: The yield of screening programs can be increased by home visits. The success of referral from screening can be augmented by counseling and by assisting patients to make and keep appointments. In contrast to the lack of effect of unimodal interventions for medication and follow-up compliance, several controlled trials have shown statistically and clinically significant increases in compliance from combinations of interventions. All of these approaches are characterized by interactions between the provider and patients.

New directions in improving compliance. Nevertheless the successful compliance improving strategies, the understanding of compliance, according to the authors, remains incomplete. Two promising avenues to understanding, in their view, are studies of the clinician-patient relationship and the role of social support in compliance. Both aspects are discussed; on the first aspect the review of Garrity (see no. 18) is summarized and added with some new materi-

als. On the second aspect, the authors note that it has been well documented that patients from disrupted or isolated social circumstances are less likely to be good compliers than those with stable families and/or helpful friends.

Ethics. In research, according to the authors, the focus of intent shifts from benefit to the individual patient to the testing of a hypothesis in order to develop new knowledge. Ethical issues may seem to be insurmountable barriers to the execution of at least some compliance research.

Recommendations. On basis of a small informal survey, the authors conclude that the most frequently used techniques, such as public and patient instruction, are not those shown to be the most effective in well-designed controlled trials. Further, the private practice sector appears as yet little affected by new information about the management of patient compliance.

39

GLANZ, K., SCHOLL, T.O.

Intervention strategies to improve adherence among hypertensives: review and recommendations.

Patient Counseling and Health Education; 4, 1982, no. 1, p. 14-28, 87 ref.

nivel

This paper reviews attempts to improve adherence to medical regimens for the control of high blood pressure. Adherence to anti-hypertension regimes is defined as a behavioral problem, which includes a series of steps: participation in screening, entering treatment, and adhering to the prescribed regimen. Interventions, their efficacy, study designs and populations studies are reviewed, and recommendations for future testing are made.

According to the authors, the problem of adherence can be described in terms of a simple formula; ½x½x½, that is, one half hypertensives are aware that they have the disease; one half of those are not receiving treatment; and one half of those in treatment are inadequately treated and have uncontrolled blood levels.

Results. Three types of adherence are reviewed: (1) appointment keeping, (2) adherence to medication regimens, and (3) blood pressure control programs. Strategies are classified into structural interventions (organization, delivery, regimen) and educational

interventions.

Appointment keeping. On basis of the literature reviewed the authors conclude that structural interventions, such as substantive clinic restructuring and use of follow-up clerk reduced dropout rates. Educational interventions, using mail and telephone reminders were consistently found effective, with mail reminders considered most efficient. A study using only nurse-patient education increased knowledge of illness in the experimental group but did not reduce the proportion of dropouts.

Medication regimens. The authors reviewed studies of hypertensives that used adherence to a drug regimen or blood pressure control, or both, as outcome variables. In addition to the statistical significance, the authors calculated a 'clinical significance' coefficient of the studies. On basis of the literature they conclude that: structural interventions demonstrated short term effects, which exceeded the criteria of clinical significance, but no long-term effects were reported. Educational interventions that yielded clinically significant short-term effects included individual education/counseling by nurses during home visits, use of a set of tailored behavioral strategies, and contingency contracting. Neither group education nor individualized psychosocial counseling by a social worker were improvements over routine care by a family practitioner. Self-monitoring and recording of blood pressure did not significantly improve blood pressure control.

Model blood pressure programs. These programs are a composition of multiple strategies for screening, monitoring, education, and follow-up. According to the authors, the studies reviewed vary in endpoints used for evaluation. However, all programs have demonstrated their feasibility on a large scale and increased levels of continued treatment and/or blood pressure control above local and national baseline levels.

Discussion. Discussing the methodological aspects, they note that sample sizes varied considerable among studies. Further, it was apparent that follow-up data regarding long-term effects were not reported for many studies. They argue that in short duration studies, the possibility of getting significant results depends on the power of the treatment variable. In their view, attitude change research has shown that long-range effects are greater for general attitudes, and immediate effects are greater for specific attitudes. In addition, specification of interventions, the individualization of strategies and the role of health professionals are discussed.

The authors conclude that structural interventions are becoming increasingly widespread and have great potential for long-term improvements in hypertension control at relatively low cost. Further study of educational strategies is required to clarify the conditions for effective education and the intermediate goals enhancing compliance.

40
CARMODY, T.P., MATARAZZO, J.D., ISTVAN, J.A.
Promoting adherence to heart-healthy diets: a review of the literature.
The Journal of Compliance in Health Care; 2, 1987, no. 2, p. 105-124, 78 ref.
nivel (C 2423)

In this article, the authors discuss studies of dietary adherence. Specific studies using hypocholestoremic (low fat, low cholesterol) diets in treatment of hyperlipidemia (elevated cholesterol and/or triglyceride levels in the blood) and prevention of coronary heart disease (CHD) are discussed. The authors also discuss factors and strategies for promoting long-term adherence. A total of 19 intervention studies are selected. The authors follow the definition of adherence of Haynes (see introduction). The methodological problems of measuring adherence with diets are discussed in more detail. According to the authors, the particular dilemma faced by researchers is that dietary compliance is generally not amenable to any direct method of assessment. In their review, they choose for the reduction of blood cholesterol as the measure of adherence.
Results. The results of dietary interventions range from 3 - 24% reduction in blood cholesterol over a range of 24 weeks to 8 years. On basis of five studies of dietary intervention trials for secondary CHD prevention, the authors conclude that significant dietary adherence and reductions in serum cholesterol levels were achieved among middle-aged, post-myocardial infarction men involved in intensive clinical dietary programs, particularly in more controlled settings. Results with healthy populations living in the community and participating in community based mass media and behavioral interventions were less impressive, according to the authors. In the clinical studies, reductions in blood cholesterol levels ranged from 12 to 20 % and from 3 to 15 % for the community studies. The authors conclude that the findings are grossly similar to long-term ad-

herence levels observed in the treatment of chronic illnesses.

Factors. According to the authors were many of the community studies based on the perspective of social learning theory. They assert that little empirical effort has focused on psychosocial determinants of hypocholesteremic diets. On basis of three studies, the authors conclude that the cognitive attitudes one has developed toward individual food products play an important role in the extent to which such foods will be part of one's regular diet. Further they discuss interpersonal variables. The authors give the example that eating preferences are established by family patterns assimilated early in life. Nevertheless, few empirical studies have examined the role of the family in the development of patterns of foods consumed by the individual. The authors discuss the role of the mass media, particularly advertising is discussed. They note a massive change in eating habits which has occurred during the lifetime of the past generation, as Americans have increasingly enjoyed the convenience of fast-food establishments and easy-to-prepare foods.

Improving adherence. The authors discuss: health education, family-based and group intervention procedures, and relapse training. They regard health education not sufficient for behavior modification. They discuss several reasons for family-based or group intervention. In families it provides the opportunity for young children to develop eating habits early in life. Dietary changes are more likely to be maintained when made by an entire family. And the involvement of a cooperative and supportive spouse can facilitate dietary change and maintenance. Relapse training has been developed to maintain eating behavior. Self-efficacy techniques have been successful in the treatment of alcoholism and cigarette smoking. The authors conclude that long-term maintenance requires an internationalization of those values and skills necessary for continuing healthful eating habits.

Discussion. The authors assert that comparisons of the effects of interventions on levels of dietary adherence across different types of dietary intervention studies are difficult to make because of the variability in intervention procedures, the specific dietary prescriptions, subjects' characteristics, assessment methodologies, duration of interventions, and major dietary end points used. The authors advocate focusing dietary intervention on the family unit as a way of producing and maintaining dietary change for two reasons: (1) the family is the primary agent of socialization; (2) dietary changes were shown more to be maintained when made by an entire

family.

According to the authors, the problem of relapse remains a major challenge for interventionists promoting long-term adherence. They believe, these methods are also applicable in dietary regimens. Relapse prevention training procedures involving role playing and problem solving as well as self-efficacy estimates, based on cognitive-social learning theory represents a promising approach for facilitating long-term adherence, in their view. Further research is needed to explore the impact of the family on eating behavior as well to investigate still-untried methods for facilitating family-based, long-term adherence. The authors conclude on basis of their review, that a broad-based cognitive social learning model provides the most comprehensive theoretical foundation on which to design dietary intervention procedures.

41

FINN, P.E., ALCORN, J.D.

Noncompliance to hemodialysis dietary regimens: literature review and treatment recommendations.

Rehabilitation Psychology; 31, 1986, no. 2, p. 67-78, 35 ref.

nivel (C 2438)

This review provides: an introduction to dietary noncompliance in patients with chronic renal failure treated with hemodialysis; an evaluation of the current status of assessment and interventions; and suggestions for the development of treatment design strategies.

In the absence of a functional kidney, there is an accumulation of fluids, toxic wastes, electrolytes, and minerals. The purpose of hemodialysis is to remove toxins and excess fluid from the body. Dietary factors that, according to the authors, require regulation include limiting protein intake, limiting intake of specific electrolytes, adhering to a regimen of vitamin supplements, and lowering fluid intake. The authors review pharmacological and behavioral interventions.

Pharmacological intervention. One investigation into self-medication studied the use of sodium polystyrene resin candy in comparison to a control group receiving a placebo. A significant decrease of potassium was reported in the experimental group. This study had no follow-up. A second study reported that the use of VA-Oralube, a saliva substitute, decreased thirst and therefore fluid intake.

According to the authors, the value of saliva substitutes remains, because of several reasons, unclear.

Behavioral interventions. One study used three interventions: behavioral contracts with patients, behavioral contracts with patients and family members, and weekly telephone contacts by nursing staff. Each resulted in decrease in noncompliance as measured by potassium and intersession weight-gain. In a second study, the use of token economy decreased noncompliance. A third one year study reported that compliance was maintained only by a group that continued in treatment. A fourth study of a token economy showed a positive effect in decreasing intersession weight and decreasing blood pressure. The authors doubt whether the reported change was the result of the token system, information feedback, staff praise, or any combination of interventions. A next study of token economy showed success for weight gain with potassium and blood urea nitrogen remaining at acceptable levels. Here too, the authors doubt whether the beneficial effects were the result of the token economy, public posting, or a combination. (The kind of tokens used in these studies are not reported by the reviewers.) In a sixth study, behavioral contracting, contingent staff praise, and patient graphing of intersession weight gain were utilized. Because the treatments were mixed, the authors state that it could not be determined whether staff praise or contingency contracting was responsible for the observed changes.

Conclusion. The review reveals, according to the author, that although some studies contained weaknesses in selection of procedures for data analyses, compliance with dietary regimens can be increased through the feedback of information to the patient, staff praise, behavioral contracting, token economy, reactive effects of the research process, patient and environmental variables, or any combination. They note that the reactive effects of the research process may have been sufficient to generate treatment effects.

Recommendations. According to the authors, it would be impractical to implement all the interventions and combinations that have been reviewed. They suggest treatment packages addressing the addictive effects of successively applied behavioral interventions. Another strategy is the multiple-baseline design, which permits the measurement of response discrimination. A third suggested design is the partial-withdrawal design, which provides a basis for targeting specific components of a treatment package that may be maintaining behavior change.

5. THE ELDERLY

42
BOCKOWSKI, J.A., ZEICHNER, A.
Medication compliance and the elderly.
Clinical Gerontologist; 4, 1985, no. 1, p. 3-15, 36 ref.
nivel (C 2409)

The authors start the review with the determination that: elderly patients with their variety of medical disorders and complex medication regimens, are more likely than younger patients to suffer the consequences of medication noncompliance. They review research and interventions in the field of noncompliance in the elderly. Among others they discuss research of demographic factors, unintentional noncompliance, doctor-patient relationship, knowledge, cost, and types of medication. The interventions of educational programs, behavioral tailoring and increasing pill salience techniques are discussed.

Research. The authors write that although at least four studies in this area have not found a correlation between age and compliance, age was found to correlate with medication error in one study.

In five studies, no significant correlations were found between drug compliance and household composition.

In one study, unintentional noncompliance was found to account for less than one-third of all discrepancies in medication-taking behavior. At least 70% of non-adherent behavior was found to be intentional. The most frequently given reason for this noncompliance was a belief that the dosage was not needed. Concern about possible side effects also accounted for a small portion of intentional under-use. This negative relationship between frequency of complaints about unwanted effects and medication adherence rates has been corroborated by another study.

According to the authors, two investigations into the doctor-elderly relation and compliance don't reveal significant results.

No significant correlation was found in two studies between elderly people's knowledge about medication and compliance rates.

Two studies gave evidence that compliance rates are contingent on drug class. These studies suggested that compliance rates are lower for drugs which offer symptomatic relief than those that may have

more generalized benefits to the patients.
According to the authors, research presents inconsistent reports on the effect of cost of medications on medication compliance. One study gave a positive correlation between cost of medication and compliance, another gave no correlation.
The authors state that complexity of the drug regimen is the most consistently variable related to compliance. Three controlled studies reported that compliance rate drops when the complexity increases.
Interventions. In two studies no significant improvement was found with an educational program. In four studies, attempts at increasing pill-package salience have not appeared to increase compliance. On basis of four studies the authors conclude that the most effective treatment intervention is a combination of education about medication regimen with the use of cues to aid in remembering.
Recommendations. Given the data regarding intentional noncompliance, the authors suspect that this may be strongly influenced by the doctor-patient relationship. This has not been extensively studied with an older population. They recommend to investigate this hypothesis.

43
RICHARDSON, J.L.
Perspectives on compliance with drug regimens among elderly.
The Journal of Compliance in Health Care; 1, 1986, no. 1, p. 33-45, 50 ref.
nivel (C 2416)

This paper examines compliance research among elderly patients. Studies of demographic, pharmacological, educational factors in compliance among elderly patients are considered and recommendations for future research are made.
According to the author, the problem of non-adherence is a more complex problem among the elderly than among younger groups, because they are more likely to have more chronic diseases and to take several medications at one time. The increasing percentage of the elderly indicates that the problem of compliance among elderly will grow.
Results. The author assumes that the risk of adverse reactions increases when the combination of medicines is compromised by

inappropriate self-administration in terms of dosage or scheduling. One study showed that adverse drug reactions are higher in the elderly. They occur most often in persons taking many drugs and in patients with abnormal renal function, infection, or previous drug reactions. It was reported in a second study that these adverse reactions cause a large number of hospital admissions and tremendous expense.

A third study showed an inverse relationship between frequency of unwanted side effects and compliance. According to the author, this confirms other findings that patients stop a treatment if they think it provokes adverse effects.

It was found in two studies that elderly patients forget much of what they are told. Pacing of presentation by increasing time to study visual materials, increasing time to give responses, and slowing the pace of speech are found in three studies to benefit comprehension.

The success of improving compliance using age specific cue packages is mixed, in the author's view. Using color coded bottles (1 study) and memory aids (1 study) showed success; memory-aid stickers, packaging differences (2 studies) showed no success.

Further the author argues that loss of support persons (spouse, close friends) is a functional loss (in terms of reminders, transportation etc.) as well as a psychological loss. Lonely elderly persons may feel less desire to take care of themselves and to comply with regimens.

A review of social support noted that 33 studies showed a positive relationship, one showed a negative relationship, and 18 showed no relationship. Three studies noted a lack of confidence of the elderly in physicians, which affected rapidity of response to symptoms and to seeking treatment.

Discussion. The author argues that the problem of non-compliance is more complex among the elderly than among younger groups for two reasons: first, elderly are more likely to have more chronic diseases, which increases the possibility of drug errors and adverse drug interactions, and second, biological changes make the 'margin for error' smaller. The author recommends research of intentional and non-intentional non-adherence, research how to teach elderly patients about their regimens, and studies that begin to integrate diverse perspectives on non-adherence among elderly.

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GREEN, L.W., MULLEN, P.D., STAINBROOK, G.L.
Programs to reduce drug errors in the elderly: direct and indirect evidence from patient education.
Journal of Geriatric Drug Therapy; 1, 1986, no. 1, p. 3-18, 71 ref.
nivel (C 2431)

The starting point for this review is the assumption that the problems of compliance with medical regimens are greatest in the older age groups. The authors review: (1) medical, physical, and mental conditions of the elderly, and (2) ten experimental studies of educational and behavioral intervention.

Conditions. According to the authors, many elderly people consult several different physicians during the year and receive medications for multiple diseases. The elderly frequently are unsure of the purpose, proper dosage and schedule for the administration of prescribed medications. In one study of 55 persons of 65 and above, none had received adequate information on the safe use of their medication. Failure to provide clear written instructions has been documented by another study. This finding is made important, according to the authors, by the frequency with which 'forgetting is cited as a reason for inconsistent use.

The authors argue that the deleterious consequences of noncompliance in the elderly may be more severe, because they are less capable of metabolizing drugs, and are more susceptible to side effects and drug interactions. They suggest using a comprehensive tracking system to reduce drug errors. A small pilot-study by the authors showed that 89% of seniors had no written record of medication an 72% had no formal method for keeping track of medications.

Strategies. According to the authors, five factors have been shown in the health education literature to be important attributes of successful programs: relevance (with regard to knowledge, reading level, visual acuity etc.), individualization, feedback, reinforcement, and facilitation (provision of medication). The authors discuss each aspect. An investigation of the literature by the authors revealed ten studies published before january 1984 that systematically designed and tested strategies to reduce drug errors in the elderly. A quantitative 'meta-analysis' was used to compare and summarize the findings of the studies. The authors found that the most commonly used technique was facilitation (adjustment of medication, provision of free or discounted medication, provision of

unit-dose containers). Only about 50% of the articles used methods to improve relevancy and individualization as part of their strategies. Fewer strategies specifically employed feedback or reinforcement. The results of the analysis suggest, according to the authors, that interpersonal communication methods, in combination with written or audiovisual materials and self-help memory aids, are effective combination of intervention both in increasing knowledge an in reducing drug errors and clinical symptoms in the elderly. Interventions using behavioral, skills-development, or facilitating techniques were also powerful for reducing drug errors. The isolated use of audiovisual materials does not appear to be effective in influencing either knowledge or behavior.

Conclusion. The authors conclude that, although many caveats must be attached to these findings, the results indicate that substantial benefits from educational programs for elderly patients have been demonstrated. On basis of the analysis of the shortcomings of the ten experimental studies, they suggest that future programs to reduce drug errors should concentrate on: assessment of the background, needs and preferences of the patients; tests of program components separately and in combination; use of behavior theory; and active eliciting of questions from the patient.

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MORROW, D., LEIRER, V., SHEIKH, J.
Adherence and medication instructions.
Journal of the American Geriatrics Society; 1988, 36, p. 1147-1161, 105 ref.
nivel (C 2417)

In this article, non-adherence is viewed as in part a communication and cognitive problem. According to the authors, elderly people often do not understand or remember the information that would enable them to take their medication properly. The intention of the authors in reviewing the research is to design rules for the better design of written medication instructions. Research is reviewed that suggest rules for designing medication instructions tailored to the needs of the elderly. The authors review research which contributes to better communication. In addition to compliance and studies of the elderly, many psychological information-processing studies are included. Most studies are controlled; however, experimental and

correlational studies are not distinguished. Each of the rules describes a requirement for written medication instructions, followed by reviewed evidence.

Determinants. First, the authors discuss causes of non-adherence such as poor communication, cognitive inabilities, intentions, the role of the particular physician, and physical inability. Poor communication between health professional and patients as major cause of non-adherence was found in two studies. The authors argue this is partly due to the gradual decline of cognitive abilities (i.e. visual acuity, memory, understanding) in aging. It was found in two studies that non-adherence increases with the number of medications taken, and in one study with the number of times a single medication is taken. Both poor communication and cognitive impairments intensify other causes, like intentional non-adherence. In one study, 70% of the instances of non-adherence were intentional. That many patients under-adhere because they think they are being overmedicated was supported in two studies. Side-effects also contribute to non-adherence because patients reduce or eliminate a medication if they think it is doing more harm than good (4 studies). As a consequence, non-adherence can lead to serious medical problems. Percentages between 4-35 % of non-adherent elderly endanger their health by taking medication incorrectly were found in one study.

Theoretical approach. Cognitive research shows that understanding requires people to construct a specific, concrete mental representation of the task they must perform or the situations the instruction-text describes. This representation is called a 'mental model'. In order to take medication properly, elderly patients need a mental model of their task. Well-designed instructions help readers to easily construct this task model.

Rules and evidence.

1. 'Medication instructions (MI) should be complete'. Many instructions do not contain essential information (1 study). Information that explains why a medication is taken will help the elderly develop a richer mental model of task (1 study). Problem solving research suggests that richer models lead to more accurate problem solutions (2 studies).
2. 'MI should be list in format, with each action or warning numbered and presented on a separate line'. Instructions are more effective when their format is compatible or congruent with the way readers think about the task (2 studies).

2b 'MI should contain medication schedule and warning icons'. People solve procedural problems more accurately when the instructions contain graphic icons (3 studies). The elderly recognize pictures 40-50% better than words (1 study), and also recall pictures better than words (2 studies). People recognize sign warnings more quickly when visual icons rather than word are used (1 study).

3a. 'MI should begin with a title that names the goal of the task, and the first sentence should expand the title by describing the goal'. A basic rule of writing is to give readers the most important information first (1 study). Texts with titles are better remembered than those without titles (2 study).

3b. 'MI should mention actions in the order in which they are performed'. Texts that mention actions in the order they should be performed are read at least 20% faster and recalled 20% better than texts with a mismatching order (3 study).

3c. 'MI should explicitly signal which information is important.' These signals include placing critical concepts in sentence subject position, and printing the concepts in boldface. Readers have trouble comprehending narratives that present conflicting cues about which character is important (1 study). Elderly readers tend to remember important information 40-100% better (3 study).

4. 'MI should be familiar, use common names for medication and anchor medication schedules to routine activities such as meals and bedtimes'. People remember 50% more information from a text when they know a lot about the topic (1 study). Unfamiliar texts are likely to be misinterpreted because readers try to interpret such texts in terms of what they already know, thereby distorting the information in the text (2 study). This is especially likely for elderly, who may have more trouble distinguishing new text information from previous knowledge (1 study).

5. 'MI should be printed in at least 14 point font size'. One study found that 55% of the elderly interviewed could not read the print on their medication containers.

6a. 'MI should use common, concrete words'. People recall concrete words at least 20% better than abstract words (1 study).

The next rules are followed by evidence which is common sense:

6b. 'MI should contain single clause, affirmative sentences, except for negatively worded warnings.'

6c. 'MI should have no greater than fourth-grade readability score'.

7. 'MI should describe medication schedules with explicit words and phrases'.

8. 'MI should contain unambiguous words and phrases'.

Recommendations. The review is concluded by suggesting how to implement the rules above. Suggestions as to how to improve the medication container label, how to expand the label with full instruction set, and how to facilitate the distribution of these instruction sets to the elderly through computerized instruction systems installed in pharmacies are also made.

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RAPOFF, M.A., CHRISTOPHERSEN, E.R.
Compliance of pediatric patients with medical regimens: a review and evaluation.
In: R.B. Stuart. Adherence, compliance and generalization in behavioral medicine. New York: Brunner/Mazel, 1982; p. 79-124, 82 ref.
ruu nivel (C 2426)

The literature reviewed in this chapter is primarily concerned with the compliance of pediatric patients with oral medication. References that apply to adult patients are included to supplement the discussion of issues which have received little attention in the pediatric literature.

Incidence. Four studies have specifically investigated compliance rates of pediatric patients. Percentages were found of 56%, 95%, 83%, 32%.

Measurements. Drug assay, observational methods, pill counts, treatment outcome, physician estimates, and patient reports are discussed. The authors found that the most frequently employed measures were pill counts, either used alone or in conjunction with assays. Patient or parent reports and observational methods were less frequently employed. The measures discussed share one major disadvantage according to the authors. If patients are aware of when and why measurements are being obtained, their rate of compliance may be affected at least temporarily. Given that each of these measures has some disadvantages, they propose the use of multiple measures that may yield a more complete assessment of patient compliance, a suggestion that has been made by three other authors.

Factors. According to the authors, the literature concerned with factors related to compliance is sometimes contradictory, as they show in the example of 'negative side effects'. The health belief model incorporates a number of factors, and tries to explain and predict compliance. Several investigators have attempted to test the health belief model, particularly in its terms of its value in predicting compliance. They believe the health belief model fails to adequately predict future compliance.

Interventions. The authors classify interventions as educational,

organizational, and behavioral strategies. For each section, controlled studies are discussed in terms of procedures, outcomes, designs, and follow-up data.

1. **Educational strategies.** Three studies are discussed, which reported that supplementary instructions regarding administration schedules can improve compliance with short-term regimens. Two studies showed that using educational strategies to improve long-term compliance was less encouraging.

2. **Organizational strategies.** Three studies, investigating the effect on compliance of modifying medical and pharmacy services, are discussed. Two were concerned with long-term regimens. One study reported at 12 weeks a higher percentage of experimental patients than control patients with therapeutic blood levels of phenytoin. Another long-term study didn't find significant differences in the results of experimental and control patients. A third short-term study compared an experimental group visited by a health management specialist to control patients receiving routine services. Experimental patients were found to be significantly more compliant with their medication regimens and in keeping clinical appointments.

3. **Behavioral strategies.** Seven long-term behavioral strategies are discussed. In one study it was found that the use of an experimental pill dispenser that emitted a tone which could be terminated only by dispensing a pill led to better compliance. A second study compared the effects on compliance of a combination of strategies, including the use of flavored tablets and self-monitoring. Initial results indicated no significant differences between groups on compliance measures. A response-cost procedure was then added. At the end of the study period, compliance was found to be significantly improved for subjects exposed to the response-cost procedure and for subjects in the taste plus self-monitoring group. Two studies are criticized for their methodological-measurement flaws. In a fifth study, a point system was found to effectively increase compliance with medical regimen for an elderly heart patients. The introduction of the point system resulted in an increase in the number of walks taken, glasses of orange juice consumed, and pills taken per day. In a sixth study, it was found that explicit instructions were effective in increasing diet adherence of a juvenile diabetic. However, the addition of a point system was necessary to effectively increase daily food care and urine testing. A seventh study investigated the effects of a multicomponent compliance improvement package that included behavioral components of self-monitoring and monetary

incentives. Significant differences were found on the compliance measures, with experimental patients showing better compliance than controls. However, no significant differences were found in blood pressure. The last and most elaborate comparative study compared an individual counseling program to a behavioral group program with adult patients at risk for cardiovascular disease (both programs were compared to a control group). The investigators found no significant differences between the individual counseling and behavioral groups at the post test assessment nor at three-month follow-up.

In general, the authors criticize the infrequent reporting of follow-up data, and when reported of short duration.

Future research. According to the authors, in order to obtain a more representative assessment of compliance, measures before, during, and after compliance intervention should be collected, including follow-up measures with the intervention removed in order to assess maintenance of improvement. To insure replication of results, investigators need to clearly specify how compliance is defined and measured and how the sample is selected. On experimental design, the authors assume that the present research is in the technique building phase: investigators are attempting to isolate strategy components and combinations which reliably improve compliance with different types of regimens. According to the authors the results in terms of mean compliance rates do not allow readers to determine the range of compliance rates. Treatment outcome should be included in order to determine the relationship between compliance and outcome. On feasibility, they argue that although a number of potentially useful strategies have been identified, it is questionable whether these strategies can be feasibly implemented by health-care providers outside of research settings. In general, compliance-improvement studies have contained little information that would allow readers to determine the feasibility of procedures.

Conclusions. The authors conclude: 1. Studies which have isolated factors correlating with or predictive of compliance have stimulated intervention efforts. 2. Much of the literature on compliance improvement is characterized by discussion articles, which is characteristic of any new area of research. 3. The results of controlled investigations have suggested that educational strategies may be useful in improving compliance with short-term regimens, but not effective with long-term regimens. Behavioral strategies have been found to improve compliance with long-term regimens.

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MASEK, B.J., JANKEL, W.R.
Therapeutic adherence.
In: Russo, D.C., Varni, J.W., Behavioral Pediatrics: research and practice. New York: Plenum Press, 1982; p. 275-395, 93 ref.
ruu nivel (C 2424)

The authors examine the problem of therapeutic non-adherence in pediatrics. Research with adult populations is only considered in the absence of illustrative examples from the pediatric literature. Methodological and definitional issues in adult literature are discussed. The authors argue that despite some objections to bio-assay procedures, they are likely to be central to future studies.
On basis of five studies, they argue that behavioral approaches have proved to be the most promising in solving therapeutic adherence problems. On the basis of three studies, they conclude that self-monitoring appears to be of limited usefulness. Discussing the determinants of non-adherence, they emphasize psycho-social factors and give attention to the fact that specific characteristics of a diseases are thought to be related to adherence.
The remainder of the chapter focuses on a review by disease entity of the pediatric research. The reason for reviewing literature by disease is to integrate research with medical management of a disease.
Results of pediatric research. In the case of **middle ear inflammation**, the authors present data that indicate that the perception of the seriousness of the illness by the mother is the most significant factor related to adherence. They suggest that increased education and instruction should be a routine prevention intervention in the pediatrician's office.
On the basis of two **rheumatic fever** studies, they note that the ability of the physician to communicate effectively appears to be more important than the supposed authority of the physician in motivating the appropriate adherence behavior in parents. It is concluded that in addition to effective information, the parent-child relation remains a critical area of investigation.
In two studies involving a total of 90 ambulatory chronic **asthmatic children**, it was found than when the patients knew that they were being monitored, adherence (defined as reaching the effective therapeutic serum level) rose from 11% to 41%. The percentage of total non-adherence dropped from 23% to slightly more than 6%. The

continuing non-adherence was attributed by the investigators to the absence of close parental supervision, the taste of the medication, the necessity of administration during school hours, or a decreased motivation to take medications when they were less severely stressed. The authors remark that these speculations parallel those of two other studies.

In an investigation of **cystic fibrosis**, 80 % of the children were defined as completely adherent. While other studies in chronic illnesses have noted that adherence generally decreases with illness duration and the complexity of medical treatment, the authors mention that the high degree of adherence supports the position that disease severity and consequences of non-adherence are principal components in determining adherence.

Literature on **encopresis** reveals it to be a common childhood dysfunction which up until recently has resisted most forms of intervention. One study illustrates that a close monitoring procedure coupled with reinforcement technology has resulted in substantial symptomatic improvement.

The therapeutic regimens in **diabetes** requires the regular execution of several complex procedures and there are many occasions for non-adherence (dietary behavior, urine-testing, injection behavior, activity behavior, appointment behavior), as one descriptive study points out. In an investigation of the effects of memos and point systems, it was reported that adherence to the diet increased to a high level and was maintained during the memo condition, while urine-testing and foot care reached 100% and were maintained by the introduction of a point system. A follow-up demonstrated a maintenance effect of 100% adherence. According to the authors, this study not only demonstrates the analysis of the descriptive study, but exemplifies a cost-effective approach.

Two studies of adherence in children with recurrent **urinary tract infections**, reported a significant relationship between non-adherence to an antibiotic regimen and incidence of recurrent bacteriuria despite long-term therapy. The studies suggest, according to the authors, that a simplified regimen might result in higher rates of adherence, which was corroborated in one study.

As part of the overall management of children with **renal failure**, dietary management plays a critical role. One study examined the effects of a behavioral interventions (token economy). This resulted in significant positive dietary changes, better adherence to fluid-intake restrictions, and a reduction of intersession weight gains of

45%.

The tendency of long-term **epileptic** patients to be non-adherent has been reported a rate of 50% in one study, and estimated at 33% in a pediatric population in another study. In general, adherence is inversely correlated with the complexity of the regimen, and a strategy of fewer daily doses, a simple behavioral manipulation, should, according to the authors, be investigated further, particular since two studies have shown that the amount of phenytoin necessary to achieve seizure control and therapeutic plasma levels can be obtained by ingesting a single larger dose without risking increased side effects.

Recommendations. The authors conclude from the review that until the parameters which define adherent behavior are better understood and the assessment technology becomes more accessible, the efficient use scores of existing medical treatments will not yet be realized. On the other hand, they ask for a reordering of priorities in research, moving away from the descriptive to the procedure-testing approach described in their guideline-study.

48

JAY, S., LITT, I.F., DURANT, R.H.

Compliance with therapeutic regimens.

Journal of Adolescent Health Care; 1984, 5, p. 124-136, 114 ref.

nivel (C 2422)

This article focuses on the issue of adolescent compliance with medical regimens. Past research in this area is reviewed and recommendations suggested that may enable physicians to enhance the compliance of their adolescent patients. The authors discuss the magnitude of adolescent compliance, direct and indirect measurement techniques, theoretical approaches in general compliance literature, and adolescent compliance with oral contraceptives. Although more research is discussed, this abstract will focus on adolescent compliance research.

Magnitude. According to the authors, most studies of noncompliance have focused either on adults or both children and adults with relatively few studies including only children or adolescents. The studies involving children tend to show different results from those involving adults since they not only measure the compliance of the patient, but also of the parent. The belief that adolescents are

less compliant with medical regimens than younger children is supported by two studies and rejected by one study.
In a pediatric study 18% of the patients were taking penicillin on the ninth day of treatment. In a second study, only 7% of clinic patients completed 10 days of therapy. In a study in a rheumatology clinic, 55% of both children and adolescents were found to have good long-term compliance.

Oral contraceptives. The authors view the issue of noncompliance with oral contraceptives as a particular problem in adolescent compliance. Little is known about why many adolescents fail to comply with their contraceptive regimen. In an effort to identify adolescents at risk of noncompliance, the influence of a variety of sociomedical factors were evaluated in a retrospective study. It was found that adolescent females who made their own clinic appointment, came to clinic specifically to receive some form of birth control or see a physician about a specific medical problem, were willing to receive birth control at the initial visit, and had sexual intercourse two or more times a week, were significantly more compliant. Combination of these factors in a model made it possible to predict compliance in 72% of the cases. In a similar designed study, seven factors were found. The investigators reported that if the adolescent's parent made the clinic appointment, and when adolescents considered the physician helpful significantly higher compliance was obtained too. However, unlike the former, the latter did not attempt to build a model. In a prospective study, the influence of psychosocial factors were tested over a four month period; and identified six factors associated with noncompliance: multiple sexual partners, appointment made by adolescent, low evaluation of personal health, feelings of hopelessness, worry about pregnancy, and having had previous abortion. In a follow-up study, the effect of using peer counselors was tested compared to nurse counselors. At the first and second follow-ups, the adolescents counseled by a peer had significantly higher compliance. According to the authors, these findings suggest that nature of the interaction between the health-care provider and the patient, combined with the adolescent's sexual behavior and social psychological status, may influence how compliant she will be with her oral contraceptive regimen.

Recommendations. For improving adolescent compliance with short-term regimens, the authors suggest to use written instructions or administering a drug in one large dose. For long-term regimen compliance they suggest a combination of approaches, like reorganiza-

tion of the clinic or office, the cueing of medication, supervision by a nurse or a best friend, improving the physician-patient relationship and rewarding and reinforcing compliance.

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PELCO, L.E., KISSEL, R.C., PARRISH, J.M., MILTENBERGER, R.G.
Behavioral management of oral medication administration difficulties among children: a review of literature with case illustrations.
Journal of Developmental and Behavioral Pediatrics; 8, 1987, no. 2, p. 90-96, 17 ref.
nivel (C 2420)

The literature pertaining to teaching children how to swallow pills or capsules is reviewed. According to the authors, few studies have attempted to identify the child noncompliance with medical regimens and to instruct health care professionals in the skills necessary to increase child compliance with medical treatment routines. The acquisition of pill/capsule swallowing skills and the maintenance of compliance with oral medication are two important areas of pediatric management in their view, which have been virtually ignored.
The authors discuss five studies that have reported successful treatment of pill/capsule swallowing difficulties among children aged 18 months to 16 years. Compliance measures, experimental design and kind of follow-up study are reported for each research.
Results. In the first study, two cases are reported in which behavioral reinforcement strategies were successfully applied to enhance pill swallowing. No follow-up data were obtained in either case. In a second study, modeling and behavior rehearsal were employed to promote pill acceptance. The authors mention several methodological flaws in this study. A third study evaluated the efficacy of modeling and shaping procedures with a 6-year old child. After intervention, the child swallowed her prescribed pills during 6 months of follow-up. A fourth group of investigators implemented a treatment package consisting of relaxation training, modeling and shaping procedures, and contingent rewards to enhance pill acceptance. A 3-month follow-up check detected no difficulties with pill acceptance. Using a multiple baseline across subjects design, a fifth group of investigators examined the efficacy of a modeling and shaping procedure to teach six children to swallow pills or capsules. Five of the six children participating learned how to swallow

a pill or capsule in the training session. The sixth subject never reached the criterion. Follow-up data collected daily in the home for 3 weeks and again 3 months later demonstrated continued acceptance in each of the five successful cases. This study is, according to the authors, the only controlled investigation of pill/capsule acceptance training that appears in the literature.

In addition, a multiple **case study** was carried out by the authors; demonstrating the efficacy of a brief, easy-to-implement procedure designed to promote capsule acceptance. In this study, two four-year-old children were diagnosed to have chronic illnesses participated. In case 1, use of verbal instruction, modeling and shaping, and contingent reinforcement resulted in the rapid acquisition of capsule swallowing skills. In case 2, these training procedures, in combination with physical guidance contingent upon noncompliance, successfully produced repeated acceptance of medication by a child who had refused to swallow capsules. In both cases, compliance has been maintained for at least six months. According to the authors, the present illustrations advance the previous literature in possibility of replication of research, and conduct of periodic probes to identify efficiency of training.

Recommendations. The authors write that additional research is needed to determine which components of the training package are essential for children of varying developmental ages who demonstrate different pill swallowing histories. In this way, cost-effective protocols individually tailored to the child can be developed. The effects of sustained adult attention alone on a child's compliance, through group comparisons designs, should be examined too.

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PARRISH, J.M.
Parent compliance with medical and behavioral recommendations.
In: N.A. Krasnegor, J.D. Arasteh & M.F. Cataldo. Child Behavior: a behavioral pediatrics perspective. New York: Wiley & sons, 1986; p. 453-501, 209 ref.
ruu nivel (C 2425)

This chapter reviews the literature pertaining to parent compliance with professional recommendations. References are drawn from the adults as well as the literature in children and have been chosen to provide a representative sample of studies regarding the measurement

of compliance, the determinants of compliance, strategies for improving compliance, and priorities for future research. References that involve adult patients are included to supplement topics that have hitherto received little attention from researchers investigating parent adherence.

Definition. According to the author, the most frequently employed definition in pediatric literature is the qualitative categorization into groups, labelled, for example, 'good' and 'poor' adherers. The second most frequent definition is an index, which is typically a summation compliance score across a set of behaviors or regimens that the parent or patient is asked to complete. The most informative but seldom utilized definition is the ratio of prescribed pills taken or not taken within a specified interval. The problems of all three definitions are discussed.

Measurement. Methods of measuring patient compliance are discussed, including biological indices, direct observation, pill count, therapeutic outcome, clinical judgement, self-monitoring, and parent self-report via interview. On basis of the finding that each method has its disadvantages, the author advises to employ a combination of measures, with each measure selected to provide a unique bit of complementary information not available through the other methods. Where only short-term measures are needed, biological indices and direct observation appear the better assessment methods. Where long-term measures are required, pill counts, self-monitoring and interviews, calibrated by periodic direct observation and biological indices appear sufficient.

Determinants. Only a few studies have specifically investigated factors associated with parent compliance. For the purpose of this review, the author assumes that variables found to influence adult compliance in general are likely to be similar to those influencing parent compliance in particular. On basis of the literature, the author concludes that the highest research priorities should be assigned to features of the referral process, clinic structure, and therapeutic regimen, and to the roles of social support and differential consequences.

Interventions. Educational and behavioral strategies, adjustments of regimen, strategies directed at organizational aspects of the service delivery system for improving compliance are reviewed. On basis of the literature reviewed the author concludes that general information pertaining to the child's disorder and its management is seldom sufficient. Parent compliance is likely to be facilitated

through the use of experimentally validated behavioral training procedures designed to promote the acquisition of skills required for adherence. Once the parent has acquired the requisite skills, environmental interventions designed to further the maintenance and generalization of parent compliance can be established. Such interventions can consist of periodic prompting, self-management training, contingent reinforcement, monitoring, and feedback. Parent adherence may be increased further through the employment of medication calendars, special pill packages, prolonged action drugs, parental administration, sign alarm devices, and by feedback based upon periodic assessments of drug levels. Reinforcement contingent upon well-documented medication use and/or symptom control may also prove to be effective. Furthermore, parent compliance can be improved through organizational tactics, such as the use of reminders and differential consequences to increase appointment keeping, reduction in waiting-time before appointments, minimization of inconvenience factors, and scheduling of individual appointments. In addition, more frequent collection of follow-up data in order to assess the durability of changes in parent compliance with long-term regimen is stressed.

Future research. According to the author, there are several gaps in the parent compliance literature. First, there are few studies in this field. Second, inferences drawn from literature on adult compliance has the following problems. A common method for measuring parent adherence across a variety of problems doesn't exist. To precise and uniform definitions of compliance, the literature would be furthered if investigators were to provide more detailed information about their investigation procedures. Such information would assist current researchers in their efforts to replicate previous studies and would facilitate an assessment of the generality of the findings. Further, more studies involving inception cohorts are required. Many previous investigations have not followed all parents who began implementing a specific regimen, possibly resulting in a systematic loss of the more non-compliant parents. The author thinks it is of critical importance to study the relationship between attendance at scheduled appointments and compliance with prescribed regimens. Because it should not be assumed that the higher the percentage of kept appointments the greater the extent of parent compliance. A third major gap in the literature is the measurement of long-term adherence. Priority should be given to investigations of natural history of compliance. Finally, although many promising

intervention strategies have been identified, it is still unclear whether these strategies can be implemented by clinicians not working in research settings.

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CAMERON, R., BEST, J.A.
Promoting adherence to health behavior change interventions: recent findings from behavioral research.
Patient Education and Counseling; 10, 1987, no. 2, p. 139-154, 77 ref.
nivel

This paper focuses on adherence issues in health behavior change. A selective review of the weight loss, cessation of smoking and exercise literature is conducted to illustrate both basic principles and the current state of knowledge. The authors provide an overview of basic strategies used to increase adherence. Available evidence and future directions are discussed.

According to the authors, social learning theory provides a comprehensive conceptual framework for understanding behavior change. A number of strategies consistent with social learning model are described and evaluated. Two types focus on altering the environment: stimulus control strategies and contingency management. Several other strategies help people develop self-control, such as: setting goals, self-monitoring, development of self-efficacy, and relapse prevention strategies.

Stimulus control strategies. Although stimulus control procedures are almost invariably included in intervention programs, the authors assert that little research has been conducted to isolate the specific effects of these procedures. In one study, two behavioral weight control treatments were compared. One incorporated a range of behavior changes including stimulus control; the other focused on stimulus control. Subjects in the second condition had lost more weight at 3- and 6- month follow-up. In a second study, obese women were assigned to a cue-avoidance condition, a cognitive rehearsal condition, or a social pressure group. Women in the first condition lost more weight than those in the third condition. Participants of the first condition exceeded their caloric limit less often compared with the other conditions. However, treatment condition was not related to weight change by 1-year follow-up. Investigators of a third study put signs in public areas where escalators and stairs were both available, reading: 'Your heart needs exercise. Here's

your chance.' The percentage of pedestrians choosing the stairs increased from 5.3% to 13.7%.

Contingency management. A review of research literature showed that incentive contracting can enhance adherence. In one study using refunds, subjects lost more weight. Similarly, reduction of smoking occurred when refunds were contingent, although effects disappeared at 3- and 6-months follow-ups. According to the authors, the size of the incentive may be relatively unimportant. One study showed no significant differences, using different amounts of money refunds. The authors note an important limitation of contingency contracts is that desired behaviors tend to diminish once incentives are no longer contingent.

Setting goals. One review showed evidence that setting goals influences performance on a wide range of tasks. In a controlled study, subjects in goal setting conditions reduced both food intake and weight. Retrospectives of participants revealed that subjects assigned to a weekly goal setting spontaneously set shorter subgoals. A series of pilot studies of exercise programs suggested that flexible goals result in better adherence than fixed goals.

Self-monitoring. An overview of self-monitoring procedures suggested the following adherence-improving factors: motivation, specific performance goals with feedback, and relatively obtrusive self-recording device. According to the authors, self-monitoring is of limited value for promoting long-term adherence unless it is combined with other strategies.

Development of self-efficacy. Two studies have evaluated interventions designed to increase normal activities by enhancing self-efficacy among men recovering from myocardial infarctions. Following the interventions, patient's judgement regarding their capacity for physical exertion were more congruent with their demonstrated exercise capacity. In some cases, self-efficacy scores for running one block increased 285%.

Relapse prevention. According to the authors, several relapse prevention strategies have been evaluated, such as booster sessions, attempts to bolster social support, and training coping skills. Booster sessions have been used to fade out therapist contact gradually at the end of intensive treatment. Although there has been limited support for this approach, the authors conclude that results have been generally disappointing. The research on social support tends to be conceptually fusing, in their view.

They discuss a relapse intervention model. Training involves (a)

identifying situations in which clients are especially vulnerable to relapse, and (b) encouraging generalized changes in personal habits and lifestyle that prevent relapse. Two studies found the suggested interventions to be effective; two studies found no support. According to the authors, long-term results have been reported when the interventions were added to weight loss programs.

Discussion. The authors conclude that the existing literature lacks coherence and direction. Data are fragmentary and make little sense of systematic accumulation of knowledge. For future research, they assert there is a need for theoretical organization, to design interventions more strategically and integrate better different interventions. Second, there is a need for standardization of interventions. Uniform programs would permit replication studies, and would also facilitate the systematic development of knowledge. Third, there is a need to examine manoeuvres in relation to pertinent change processes and contexts. Instead of asking 'what is the effect of this manoeuver?', researchers must begin to ask: 'what is the effect of this manoeuver, when offered to this type of person, in this kind of context?'

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JANZ, N.K., BECKER, M.H., HARTMAN, P.E.
Contingency contracting to enhance patient compliance: a review.
Patient Education and Counseling; 5, 1983, no. 4, p. 165-178, 30 ref.
nivel (C 2404)

This paper reviews investigations using contingency contracts to enhance compliance. A contingency contract is a specifically negotiated and documented agreement that provides for the delivery of positive consequences or reinforcers contingent upon desirable behavior. The investigations are categorized into: weight change, smoking, alcoholism, drug abuse, renal disease regimen, and antihypertensive regimen.

Weight change. A first controlled study attempted to obtain weight loss in obese adults. Short-term assessment revealed that contracting (using money deposits) resulted in mean weight loss almost twice than obtained with self-control methods. However, at ten month follow-up (without additional intervention), both groups evidenced substantial recidivism. In a second study, the efficacy of two weight-reduction programs (using money deposits) for obese girls

and with a no-treatment control group were compared. Findings for the initial 12 week study period indicated significant weight loss in both treatment groups, compared with slight weight gain for the control group. Treatment effects began to fade by the eight-week follow-up an had disappeared at 31 weeks. In a third study (contract with risk of loss of personal valuables) with a single-subject reversal design, the results at 16 weeks showed a mean weight loss of 32 pounds. While the experimental condition yielded an average loss of 1.7 pounds/week, the 'no contingencies' condition experienced an average weight gain of 1.4. pounds/week. No long-term follow-up was conducted. A fourth study employed contingency contracting to achieve weight gain with a group of patients suffering from anorexia nervosa. The investigators reported a mean group increase of 20% above pretreatment weight. However, according to the author, the measurement period fluctuated, there was no control group, and no long-term follow-up was reported. A fifth study of obese patients reported, at the end of the ten-week study period, that all groups had attained a significant weight loss, with weight contract and calorie-contract losing more than the attendance contract or control group. Results obtained four months after the end of the ten-week study indicated that subjects who had continued under contract conditions lost considerable more weight than those who chose to terminate their involvement at or before ten weeks.

Smoking. A study used (money) contingency contracting to assist groups of self-directed volunteers to stop smoking. There were three small groups; two running for 12 weeks, and one for 16 weeks. Short-term success rated 84%. At three month follow-up, the 16-week group's succes rate had declined to 36%, and at 15-17 month follow-up, the 12-week group had dropped to 38%. The study contained no control group, and subjects were motivated volunteers. The results of a second study, using a 2x2 factorial design with adult smokers (money deposit contract), revealed that 89% of the smoking-behavior contingent groups had successfully quit by the dates contracted, compared with only 53% of the attendance groups. At two-week follow-up, the results were 86% and 41% respectively. The abstinence rate at three months was 51% and declined to 40% at six months.

Alcoholism. The results of a study in a laboratory setting (where by pressing a lever subjects obtained alcohol) indicated that the reinforcement component of the contract had the most powerful influence on behavior (90-100% compliance), signed written instructions achieved 40%, while verbal instructions alone were successful

in only 20%. No long-term follow-up was conducted. In a second study of (money) contingency contracting in maintaining regular disulfiram ingestion, after 12 weeks, 80% of the problem drinkers attained longer periods of abstinence than they had achieved during the preceding three years. Of the 14 subjects who accepted, more than three fourths remained abstinent for an additional contract period of about six months.

Drug abuse. A case study of a three-month contract (social reinforcers) requiring abstinence from amphetamines and other drugs, revealed that during the 12-week study period the subject experienced only one drug-use episode; anecdotal evidence implied that there was no return to amphetamines during a two-year follow-up period. In a second study, using a single-subject reversal design in methadon maintenance, the results in the first three to five months showed clearly improved behavior in half of the clients. Follow-up at six and eight months revealed that the beneficial outcomes achieved earlier were still present. The results, representing client involvement in a drug-rehabilitation program from 15 days to 15 months, showed positive outcomes for 13 subjects (of a total of 33), negative outcomes for 4 subjects,and unknown outcomes for two subjects. The study contained no control group.

Renal disease regimen. In one study, using a randomized control design of three intervention groups (using a point system contract) and one control group, the results after six weeks demonstrated that all three interventions achieved significant reductions in serum potassium levels as compared with the control group. Follow-up at three months revealed that all of the earlier intervention effects had disappeared. In two case studies of the effects of social reinforcement, findings indicated substantial improvement in regimen adherence by both subjects during the contracting intervention periods. The study lacks long-term data and a control group.

Antihypertensive regimen. One study randomly assigned subjects to a control group A receiving routine care, a group B receiving routine care plus patient education, and group C receiving the former plus a contingency contract (using material rewards). After 18 months, unlike groups A and B, in group C, diastolic blood pressure fell below control standard, and there were no dropouts.

Discussion. According to the authors, the fifteen studies reviewed demonstrate at least short-term positive effects from contingency contracting, which are simple to implement. However, the studies have a number of conceptual and methodological difficulties that

hinder interpretation of their findings. Only five studies used control groups; six lacked long-term follow-up; most studies were conducted with motivated volunteers rather than random samples and often with small numbers of subjects.

Conclusion. According to the authors, contingency contracting appears to be a useful addition to the repertoire of compliance-enhancing strategies. They view this approach beneficial for increasing adherence to short-term regimens and for getting clients started on long-term therapies.

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PEDERSON, L.L.

Compliance with physician advice to quit smoking: a review of the literature.

Preventive Medicine; 1982, 11, p. 71-84, 77 ref.

nivel (C 2418)

This paper presents a review of the literature on compliance with physician advice to stop smoking among various groups of patients. The author's purpose is to summarize the research findings and to present suggestions for future research.

The author demarcates this review from seven former reviews (conducted in the seventies) of the literature on smoking cessation techniques. The types of techniques discussed in these reviews were among others self-help manuals and education programs. Most studies reported only 20 to 30% abstinence at 3 to 6 month follow-ups, regardless of the techniques used. Regarding these low results, the author takes another line of approach and stresses the importance of the physician as a counselor in smoking cessation.

The review is presented in sections based on the patient groups: (1) general practice patients, (2) pregnant women, and patients with (3) pulmonary and (4) cardiac diseases. For each group many variables are considered simultaneously. Unless otherwise noted, follow-ups of studies are considered to be of acceptable duration, and sample sizes and control groups to be adequate.

1. General practice patients. In one study 5 % of an advised group and none of the control group had quit smoking at 6 months. However, 33% of those who were told to quit reduced the amount they smoked compared with 9 % in the control group. In another study, there was no difference in the quit rate after 6 months. In a third study,

there were significant results, indicating that advice to quit was effective.

2. Pregnant women. This group of studies concern smoking cessation of pregnant women for whom continued smoking had serious implications. Results of a controlled study indicated no difference between an advised and a non-advised group; however, more women in the intervention group modified their consumption. Another controlled study reports that there was a significantly larger reduction in amount smoked by the intervention group than among the controls.

3. Patients with pulmonary disease. From the literature reviewed, the author infers that presence of serious illness may add credence to the physician's message and be related to increased compliance. Compliance rates vary from 20 to 51% in eight non-controlled studies into physician advice. In a well-designed study, it was found that strong urging to quit smoking by a physician was associated with an increase in cessation. At the 3 year follow up, 36% of the treatment group and 14% of the control group were abstinent.

4. Patients with cardiac disease. According to the author, the reviewed studies give further support to the notion that presence of a serious disease may be an important precursor of compliance. Successful smoking cessation is relatively high in survivors of myocardial infarction; the quit rates range from 22 to 62% in 8 studies. Three investigations present attempts to increase compliance by varying treatments. All found higher abstinence levels in groups given intense education and advice.

Discussion. The author regards a marked variation in the methodology and results of the studies presented, which makes it difficult to draw any conclusions. With these limitations in mind, she discovers some trends in the literature: the quit rates in more recent studies appear to be lower than in older studies, and there is a positive association between severity of disease and rate of quitting. Exceptions to these generalizations are mentioned. Although there are comparatively few studies with general practice patients and pregnant women, she marks the fairly low abstinence rates of these two groups. In general, patients with myocardial infarction are much more likely to quit smoking than are other patient groups.

Recommendations. Some suggestions coming from the health belief model are discussed. The author beliefs that patients who are experiencing respiratory and cardiac problems have stronger health beliefs than those seen in general practice or when pregnant. Possibly the clinician can motivate by intensifying the message.

Support for this position is found in three studies.

Future research. Because of the variation in methodology and follow-up periods, the author beliefs it is difficult to reach any but the most general conclusions about the impact of the physician on smoking. She suggests that follow-ups of at least 6 months and even longer be carried out; and random assignments of patient to groups be used in future research. Very little is known about the specific role of the physician in life-style modifications. Not only are investigations of the components of the physician communication needed, but also evaluation of techniques, supplementary to physician advice.

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DISHMAN, R.K.
Compliance/adherence in health-related exercise.
Health Psychology; 1, 1982, no. 3, p. 237-267, 131 ref.
nivel (C 2414)

In this review the author critically examines available evidence around models of exercise behavior. These models consider: (1) the exerciser, (2) the exercise setting, and (3) the person-setting interaction.

1. **The exerciser.** According to the author, the belief in the importance of psychological determinants of adherence such as motivation, perceptions of the program, training objectives, or personality is based primarily on intuition rather than empirical evidence. In many reports the investigators have failed to demonstrate reliability or validity of their psychological assessment. The author discusses those studies which are based on the most reliable and valid data. In his view, attitudes towards physical activity (in 3 studies), self-perceptions of exercise ability (1 study), and feelings of health responsibility including locus of health control (1 study) have not predicted who will eventually adhere or drop out of an exercise program. While these findings may initially appear inconsistent with attitude theories, they support two studies that show attitudes and beliefs are of limited utility in predicting a long-term behavior such as exercise adherence. The role for self-motivation in exercise therapy remains to be empirically tested.

The most consistent discriminator between adherers and dropouts, according to the author, has been the fat-percentage of body weight,

in accordance with three studies. Several interpretations of these findings are discussed.

Based on demographic analyses reported in four papers, dropouts from cardiac rehabilitation programs for post-myocardial infarction have been characterized relative to adherers as blue collar workers who smoke and who are inactive in their leisure time.

The exercise setting. Although it seems obvious that characteristics of the exercise setting should have important influence on adherence, the author regards there is little research to support this hypothesis. Three studies have implicated convenience or accessibility of the exercise setting as a major influence. The author discusses exercise mode/treatment alternatives and several investigations into exercise dosage.

On basis of several studies, the author concludes, there is little information available to support the effectiveness of intervention strategies on adherence. Although strategies like home based programs, behavioral contingencies and contractual agreements, social reinforcement, forms of goal-setting, self-monitoring have produced increased adherence; these studies lack the use of controlled comparisons.

The person-setting interface. The author reviews two theoretical approaches which he supposes to serve a more adequate view of the adherence process than the standard approaches: an addiction theory and a stage theory. According to the author, addiction as a model of adherence behavior warrants attention for two reasons. First, 85% of individuals report they 'feel' better when they exercise. Secondly, the conceptualization of exercise adherence as an 'acquired habit' draws together a variety of possible social, psychological, and biological determinants.

The stage theory proposes that the seeking of medical care can be effectively characterized by definable stages of delay during the decision making process and that different behavioral influences can mediate behavior in each stage. Although findings of three studies do not address long-term or compliant behavior and do not involve exercise settings, the author regards the theoretical approach relevant to issues in exercise adherence. Descriptive data suggest that distinct behavioral events or stages do exist for exercise adherence.

Discussion. The author argues that exercise adherence research has been characteristically a-theoretical and suffers from several methodological flaws. Adherence-related variables have not been

randomized or manipulated allowing the issue of causality of reasons for behavior may be addressed experimentally. With exception of a few studies, both the internal and external validity of the intervention results cannot be determined. The lack of explanatory evidence regarding relative determinants of adherence behavior prohibits the advancement of reliable strategies for adherence facilitation. There is a lack of replicated findings. The types of analytic procedures employed in the adherence research have not lent to easy application in clinical settings. The majority of studies have employed univariate approaches which account for practically insignificant amounts of adherence variance.
The author recommends among other things the following research priorities: determination of the diagnostic criteria for dropouts, experimental determination of effectiveness of intervention strategies, examining adherence as a function of behavioral stages, and determination of individual effects once average effects are known.

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OLDRIDGE, N.B.
Compliance and exercise in primary and secondary prevention of coronary heart diseases: a review.
Preventive Medicine; 1982, 11, p. 56-70, 62 ref.
nivel (C 2428)

The aims of this review are: (a) to summarize both primary and secondary prevention exercise programs of at least 6 months duration, with at least 40 subjects, designed as supportive treatment in the management of persons with varying degrees of coronary heart diseases where compliance data are reported, and (b) to focus on issues related to the future study of compliance with exercise programs. The author defines compliance as the continued participation in the exercise program at some minimal frequency in attendance rate per session.
The literature on exercise programs is divided into exercise programs designed (a) for persons with a moderate coronary risk factor profile, i.e. primary prevention, and (b) for patients with documented coronary heart disease, i.e. secondary prevention or cardiac rehabilitation. Definition and measurement of compliance and experimental design are reported for each reviewed study.
Results. According to the author, the dropout phenomenon in cardiac

exercise rehabilitation among men is not well understood; there is practically no information on women. There may be a typical profile of the potential dropout, but this needs more prospective investigation, in his view. There is little or no evidence about exercise behaviors once the patient has graduated from secondary prevention program, although there is some evidence from two primary prevention programs that exercise habits are not maintained in the long run. Approximately 40% of the patients entering clinical trials complete 48 months of participation; the dropout rate is highest in the first 6 months (30%), then decreases over the next 18 months and once the patients have complied for 24 months, few dropout during the next 24 months.

A number of studies tried to identified characteristics of potential dropouts, volunteers and compliers. The following is a summary of characteristics and reasons for volunteering, complying and dropping out (reported in at least three or more investigations). Volunteer characteristics: living or working near the exercise center, having white collar occupational status, and being active in leisure time. 2. Dropout characteristics: smokers, inactive in leisure time, spouse neutral or negative to their participation in exercise. 3. Reasons for dropout: program inconvenience, transport difficulties, psychosocial problems, and medical reasons. (Reasons for not joining are similar to those given for dropout.) Reasons for compliance: health benefits increased self-confidence, social aspects, and spouse encouragement.

Recommendations. According the author, clinical and physiological outcomes are the major focus of investigation, with the behavioral outcomes less investigated. He recommends examining health behaviors in terms of clinical, physiological, social and psychological outcomes.

The author regards two major factors for the wide range in dropout in exercise programs: lack of conformity in definition of compliance and in program design. The compliance rates in various studies are generally given as the number of persons who attend the sessions on a regular basis for some length of time. The author wonders if this association accurately describes the degree of compliance with the amount of physical activity. A dropout may be in fact a complier with exercise prescription while not complying with the program protocol.

The development of a conceptual model is, according to the author, the first step toward identifying stages and factors which may be

involved in the adoption and compliance with exercise programs. Further investigation is needed to improve this model for explaining the processes of adoption of and compliance with exercise and goal achievement.

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ICE, R.
Long-term compliance.
Physical Therapy; 12, 1985, no. 12, p. 1832-1839, 49 ref.
nivel (C 2432)

This article reviews long-term compliance to health-promoting behaviors in healthy subjects and patients with coronary heart disease. The author's purpose is to present suggestions that the clinician can use to improve patient compliance in primary prevention and cardiac rehabilitation programs. The author discusses studies of communication, primary prevention, exercise programs, and cardiac rehabilitation.

Communication. The author discusses the relation of several factors with recall of medical information. A review of studies dealing with patient recall demonstrated that elapsed time between presentation and recall had little relationship to success of recall. Further it was reported only 63% of the information was recalled under the best of circumstances. It was found that medical knowledge correlated with recall, but intelligence and age not. Moderate anxiety is associated with recall. Diagnostic statements are better recalled than statements containing instructions and advice. Recall after oral, visual and oral, and written presentations was not significantly different, but the information given earliest was retained better. Three experiments on recall of dietary instruction showed that in all cases specific advice was better than general advice.

Primary prevention. The author reviews compliance in two areas of risk factor modification: weight reduction and exercise.

Weight reduction. According to the author, evidence suggests that once an individual becomes obese, the condition is self-perpetuating. The author summarizes compliance in diet and exercise programs with behavioral therapy in mild and moderately obese people. He concludes that a large number of studies have shown behavioral therapy is more effective in conjunction with diet and exercise than pharmacotherapy. On basis of a review of 21 reports the author

states the following points on behavioral therapy in treating obesity: dropout rates are less than in traditional programs; half of the subjects suffer from anxiety; the amount of weight loss varies during treatment; prediction of outcome is not successful; subjects with obesity early in life lose as much weight as those with the onset of obesity in adulthood; weight loss is correlated positively with therapist experience and skill. The author remarks that most of these studies were short-term, and the subjects were only mildly overweight.

Exercise programs. According to the author, 34 of 41 experimental studies conducted in the last 20 years found motivation to be a significant factor influencing compliance. An often cited study demonstrated that patients most likely discontinue treatment are those who previously dropped out of another program. A second investigator found that self-referred patients are less likely to drop out of treatment than are patients referred by others. In a third study, it was found that self-motivation, body weight and percentage of body fat were best correlated with exercise adherence. A multiple regression of these factors yielded a correlation of .67, accounting for a considerable portion of variance. The investigators concluded that the decision to adhere to a prescribed exercise program may be largely dependent on body composition and self-motivation. They believed that setting and interpersonal relationships exerts only minor influence on adherence. In a fourth study, it was found that exercisers who failed to attain their own exercise goal dropped out roughly twice as fast as those who did attain them.

Cardiac rehabilitation. According to the author, long-term exercise training in cardiac rehabilitation programs, despite the presence of life-threatening disease process, is low. He presents a strategy in four phases.

Discussion. On basis of literature, the author proposes the following strategies for attaining long-term compliance: (1) coordination of the time of the day of the exercise program, (2) reinforcement during the exercise, (3) stimulus control (reminders, cues), (4) cognitive strategies, (5) behavioral contracting, (6) adjunct programs that include spouses, (7) increased patient-physician interaction, (8) creation of long-term exercise, (9) increased feedback on progress.

AUTHOR INDEX

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SUBJECT INDEX

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