Desensitizing Allergy Injections: A Biological and Psychological Tool for Behavior Change

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The patient with a chronic allergic condition is often annoyed by sneezing, congested nose, postnasal drip, cough, wheezing, itching, etc. He may also be unhappy, irritable, overactive or underactive, tired, and less than adequate as a job-holder, spouse, or parent. When other methods of treatment do not provide relief, treatment of the allergic condition by the administration of desensitizing allergy injections is available.

Use of desensitizing injections can be an effective biological treatment (Deamer, 1974). These injections can also serve as a means of psychotherapeutic management for the individual in need of altered social conditions.

Improvement in the allergic individual who is receiving allergy injections may be due to the immunologic effects of the injections, the environmental social effects that accompany the procedures, or both. To the author's knowledge, the psychological benefits resulting from the use of allergy injections has not commonly been acknowledged in considerations of this treatment. Often, both biological and psychological factors account for the favorable changes that occur in the patient. This is understandable because it is easier to find a positive effect from a treatment when there is a favorable biological effect than it is to create such an effect mentally when there is no basis in fact for it.

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Biological Effects

There is no question that, in some allergic patients, allergy injections produce a change in the immune system of the patient. This biological effect can account for remarkable improvement in the symptoms of the allergic individual. It can also, at times, be responsible for unwanted symptoms. The majority of individuals, however, who receive a carefully supervised program of desensitizing injections have a favorable result. The effectiveness of desensitiza-tion has been demonstrated in double-blind studies (Frick, 1974).

The matter of patient selection is crucial for a good result. When a careful allergic history is taken, and when allergy tests are properly carried out and evaluated, then the patient who is chosen to receive injections is likely to have a beneficial result.

Desensitizing injections are recognized as a helpful treatment measure with Type I allergy, that is, the kind of allergy mediated by IgE (reaginic) antibody. Type I allergy includes hay fever, asthma, perennial and seasonal allergic rhinitis, and perhaps a few other allergic disorders.

Allergy injections are administered as serial hypodermic injections. The material injected consists of the substances to which the patient is allergic, as determined by skin testing. In this procedure, potential allergenic substances are placed on scratches that have been made on the skin surface (scratch tests), or directly into the skin (intradermal testing). The patient is hypersensitive (allergic) to those substances which show an immediate skin reaction consisting of redness (flare), swelling (wheal), or itching. Often pseudopodia are seen. These finger-like projections from a wheal reaction denote an especially strong reaction to the test substance.

It is important that all allergy skin test reactions be compared to a control. The control scratch or injection site is made by placing diluting fluid alone on or in the skin. All allergy skin tests should be interpreted only in relation to the control. The skin of some individuals is highly reactive to the procedures of scratching or injection. This dermo-graphia makes the reading of the skin tests more difficult and controls even more important. A person is considered to be allergic to those substances that exhibit redness, swelling, or itching to a degree greater than that of controls.

At times provocation tests may be made with allergens placed in the nose or bronchial airways. Pollens, dust, other inhalants (epidermoids such as animal dander, furs, furniture stuffings, etc.), and molds are the allergens that are commonly used in skin testing. Skin testing with foods is not particularly reliable. Skin test allergens in wide variety are readily available from commercial sources. Regionalized testing solutions for use in various parts of the country are available.

The author's experience indicates that the most successful results with allergic desensitizing injections are obtained when a patient is sensitive to pollens and when he receives pollen injections. Treatment with dust, molds and epidermoids may be somewhat less effective, although individual variation is great.

The allergic skin reaction occurs because of the presence of the allergic antibody (reagin, IgE) in the skin (Johannson, 1974). This antibody was formerly known as skin-sensitizing antibody. It combines with the allergen on the surface of tissue mast cells or circulating basophils and leads to the release of histamine and other biochemical mediators from these cells. Histamine is the chemical mediator responsible for the redness and swelling (flare and wheal) of the positive skin test reaction.

A somewhat new test, the RAST (radio-allergosorbent technique), may eventually replace skin testing as a means of allergy diagnosis (Wide, 1973). In the RAST test the patient's blood is drawn, the serum obtained from it, and the specific IgE antibodies within the serum are identified by exposing the patient's serum to various allergens. The RAST test is a sensitive in vitro method for the assay of reaginic (IgE) antibodies to particular allergens. It may also be used as a means of quality control in the preparation of allergy treatment extracts.

At the present time the RAST test is expensive and the choice of available allergens for testing is somewhat limited. In most cases, at this time, a comprehensive allergy history and a properly performed set of allergy skin tests remain the cornerstone of diagnosis.

Allergy treatment with desensitizing injections is a long process involving

repeated shots given at regular intervals ranging from every few days to once a month.[2] Treatment is usually continued for several years.

Aqueous extracts of various allergens are most frequently used. Treatment may be given on a year-round basis or merely in connection with a seasonal allergic problem. Year-round treatment is most commonly used. Injection treatment is usually continued for several years or longer.

A very dilute concentration of the allergens is initially used in treatment. More concentrated solutions are administered in a stepwise fashion as the patient's tolerance permits. Progressing too rapidly or giving an excessive load of allergens at any one time can be responsible for the development of unwanted allergic symptoms rather than relief there from.

Local or generalized reactions may occur in the patient if the pace and intensity of the injections are not suitable for the individual. A local reaction consists of swelling, warmth, or redness at the site of the injection. If the swollen area is less than the diameter of a quarter coin, it is not likely that a change in the schedule of injections need be made. Larger local reactions may call for an alteration in quantity or timing of the injections.

A generalized reaction consists of allergic symptoms such as sneezing, coughing, wheezing, headache, sore throat, diarrhea, itching, etc. At times, a personality change may be the only sign of a generalized (constitutional) effect. When this change in personality is favorable it is a positive benefit from treatment.

A serious anaphylactic reaction is accompanied by shock and may result in death. Such a generalized acute constitutional reaction is not a common occurrence in the use of desensitizing injections, but the possibility of such an immediate reaction must always be considered.

Adjustments of dosage and/or change in the frequency of injections must be made by the supervising physician when lesser untoward reactions occur. The patient should be observed for 20 minutes after each injection, the injection site should be inspected, and the patient should be questioned before each additional shot about reactions from the previous injection. When weak solutions are used in the beginning of treatment, and when careful attention is paid to local and general reactions that occur, anaphylactic reactions can almost always be prevented.

Treatment with allergy injections was initially termed allergic desensitization. Predictable desensitization of guinea pigs had been easily obtained, and it was presumed that the same desensitizing effect might occur in the human.

The term hyposensitization was used after allergists found that allergy injections seldom turned off the total allergic process. A reduction in allergic antibodies is accomplished by properly chosen allergic injection treatment, so the term hyposensitization does appear to be appropriate. Both terms, however, desensitization and hyposensitization, are used interchangeably in clinical practice to describe this treatment. Whichever term is used, it should be understood that the treatment is a form of immunotherapy. This term itself, immunotherapy, is being increasingly used to designate treatment of allergy by serial injections of allergens.

The full mechanism of action of these injections is not completely known. Inhibition of the histamine-releasing enzyme system activated by union of antigen with cell-fixed antibody is known to occur following these injections. Patients undergoing hyposensitization for ragweed hay fever show the appearance of so-called blocking antibody in their serum. This antibody is an IgG type of antibody. It has a greater affinity

2 A commercial preparation is available (Allpyral Extracts, Dome Laboratories), that may be given every one to two months once maintenance levels are reached. The prolonged action of this kind of extract is due to alum precipitation of the antigens.

for the allergen than IgE antibody and thus prevents the sequence of reactions which result in allergic symptoms. There is a reduction in the in vitro sensitivity of peripheral blood basophils to release histamine by an allergen and a prevention of the anamnestic (recall) rise in specific ragweed IgE antibody that occurs during the ragweed season. An excellent discussion of the effects of injection treatment (as well as all other aspects of allergy diagnosis and treatment) is given in Dr. Ben Feingold's book, **Introduction to Clinical Allergy** (1973).

It is now known that everyone can produce IgE, but it appears that some individuals have difficulty in turning off their production of this allergic antibody. It has been shown that injectable immunotherapy, when effective, helps the body to turn down the production of the IgE immunoglobulin (Norman, 1975). IgE levels gradually diminish as desensitization progresses, and they rise again if it is discontinued.

What substances are contained in the allergy treatment solutions that are injected into the patient? Correspondence with Hollister-Stier Laboratories3 has provided the following information: *Treatment allergens are primarily protein in nature. They contain six to twelve, or more, antigenic protein components. Varying amounts of polypeptides, dipeptides, and amino acids are included. Allergens are defatted in preparation, but they may contain carbohydrates of antigenic significance. Kleenex and paper are antigens with a high carbohydrate content.*

Allergy treatment solutions are standardized primarily on the basis of their protein content. Better standards are increasingly available as identification of component antigens is made.

Varying amounts of mineral salts are contained in the treatment extracts. Preservatives such as 50% glycerol and .4% phenol are used. In bacterial vaccines the preservative is .7% thimerosol. Animal toxicity and strict sterility tests are carried out before the allergy vaccines are released for use in treating the patient.

In general, the greater the total amount of treatment material that can be given to the patient, the better are the results. Controversy exists, however, about the use of high-dose or low-dose vaccines in commencing treatment. This author uses very low-dose treatment solutions and continues to be surprised at the effectiveness of very dilute solutions. In some patients the administration of as little as .1 milliliter of a 1/1,000,000,000 solution has a discernible effect upon the patient. In some of these patients, giving a placebo injection of sterile saline has no effect.

Psychological Effects

Allergic desensitizing injections can serve as a means of psychotherapeutic management for the individual who is in need of a therapeutic crutch.

Scientists, in their zeal to find the biological basis for immunotherapy, must not overlook the positive value that these injections may have on a patient's mental activity. Psychic stimuli may profoundly affect the function of the brain, the autonomic nervous system, the endocrine glands, and other organs.

In an article about the treatment of obesity with human chorionic gonadotropin (1974), Dr. Peter Lindner stressed the importance of the environmentally structured regimen as indispensable for success. Many times, in the treatment of allergy, it is the environmentally structured regimen that may be responsible for improvement. A series of allergy desensitizing injections constitute a structured treatment regimen in a major sense. The injections are very tangible; furthermore they keep reappearing at regular intervals "just like clockwork."

Improvement in the allergic individual who is receiving these injections may be

3 Dr. Robert A. Stier, (M.D.), Medical Director, Hollister-Stier Labs., North 3525 Regal St., Box 3145, Term. Annex, Spokane, Washington 99220. The Hollister-Stier Laboratories is a prominent commercial house supplying allergenic extracts for testing and treatment.

due to the structured regimen and the changes that it brings in the life and viewpoint of the patient or those around him. When such is the case, the administration of sterile water or sterile saline, in place of the allergy vaccine, unbeknownst to the patient, should be followed by an equally favorable result. Elsewhere (Wunderlich, 1975) this author has described the helmsman effect that may occur when a physician and parent embark upon a course of management for a child with a learning or behavioral problem. The same beneficial effect is seen in adults when a knowledgeable therapist directs a treatment program for the individual who is not coping well with the stresses of job, husband, family, etc.

The fact that some confident therapist "takes the helm" and commences to steer a course through troubled waters can bring about immediate improvement in a person and his family. A settling of behavior frequently takes place as involved individuals give up futile, chaotic, disorganized, and ineffective attempts to manage their lives. The presence of a helmsman with a firm hand on the tiller can' be responsible for rechanneling of the patient's energies into effective coping behavior. Productive efforts that are effective in helping an individual and those around him soon provide impetus for the development of other coping skills.

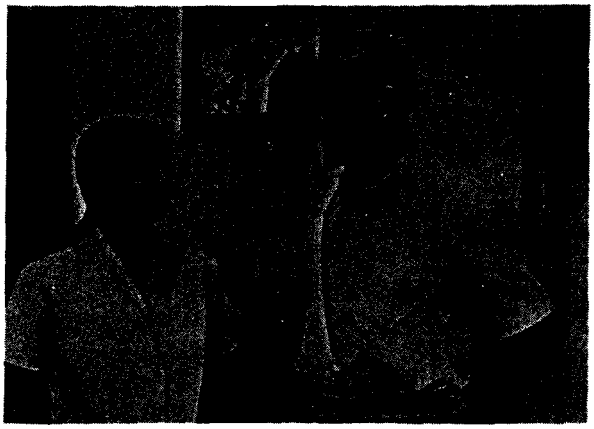
A positive viewpoint on living is apt to emerge. The presence of a helmsman may show the weak and saddened patient that effective help can be obtained and is available in the event that other crisis situations arise.

The helmsman effect is, indeed, a major factor in getting persons well in many medical situations. It is likely that the helmsman effect is a principle reason for success in the treatment of obesity with injections of human chorionic gonadotropin (HCG). Dr. Peter Lindner has emphasized the importance of rules and ritualistic procedures in this treatment (1974).

Because of the helmsman effect, it is possible to reap more success from a particular biological therapy than would be possible from the treatment alone. The degree of success attributable to the helmsman effect differs in nearly every case. In some individuals successful results will be totally due to this factor, whereas in other individuals the helmsman effect will be essentially non-operative.

When the decision is made to treat an individual with allergy injections, the helmsman effect may come into play immediately. As a result, improvement may occur in the patient before the time that injections are given. Such an effect can be an external source of comfort and security for the patient or his family who may have been adrift in a sea of drifting hopelessness. Comfort and direction may have come from the therapist who, by his manner, reputation, or style of operation has radiated a message of hope and success through his treatment techniques (see Figure 1).

FIGURE 1



The physician and his patient. The characteristics of the physician, and the setting in which he works, have a great deal to do with the effectiveness of his treatments. When he "takes the helm" and provides direction that the patient needs, his biological treatments may become more effective than they otherwise would be.

A capable therapist, however, does much more than this. By administering allergy injections in a confident way he is a living model of effectiveness. The therapist and the social setting in which he works exist as a model system of

getting things done. Allergy injections are given in a regular time sequence, at regular intervals. There are certain rules that must be followed (wait 20 minutes in the doctor's office following each injection, e.g.), but not too many rules. Furthermore, the injections themselves are tangible evidence that something can be done to a person for his own benefit. The helmsman effect can be considered a positive gain for the patient. The fact that some capable guide is in charge and offers a systematic plan of treatment offers reasonable hope that loss of health will be prevented. When a person experiences a significant loss, he may very well become ill. The magnitude of the loss to the individual determines the impact upon the person. The helmsman effect acts like an anti-loss factor and as such alters the situation that the patient or his family perceives. Confidence, planning, projection into the future, and communication of treatment details may be important aspects of establishing a strong helmsman effect. The ability to transmit the projection of success to the patient or his family is a major component of this effect. The helmsman effect varies considerably according to the personality and beliefs of the therapist, as well as the details of his office setting. (See Figure 1). The physician with a smile on his face, who touches his patient, massaging shoulders, pressing hands, and giving a hug here and there, may enhance his effectiveness as a therapist.

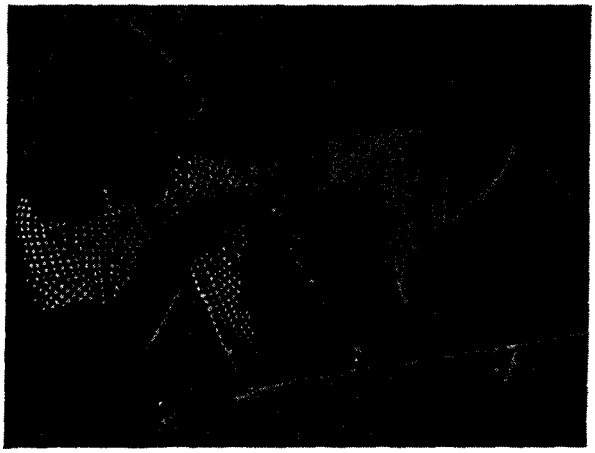
The subjective nature of the helmsman effect should be recognized for what it is. This subjective effect should be accounted for and studied in all research studies. Thoroughly objective scientific investigations are, indeed, desirable to determine the biological effects of various treatments. Nevertheless, the positive therapeutic value of a subjective factor such as the helmsman effect should not be avoided in the clinical practice of medicine. The helmsman effect should be accepted for what it is: a valuable adjunct to the magnificent therapeutic armamentarium of the modern physician.

The physician who is using injections as part of his treatment may well have an extra bonus for healing. Injections (shots) have a magic all their own in the minds of many individuals. When a physician prescribes a shot, the patient may construe this as ultimate care. It is, after all, a specialized procedure unavailable to the laity and reserved as a technique of getting someone well. An injection is something to be endured, a little pain for a greater good, a means of change for the better. (See Figure 2).

The parents of children who profit most from the helmsman-structured allergy injection series are those termed "sponge" or "jelly-fish" parents by this author. The "sponge" or "jelly-fish" parent frequently develops as the result of social conditions in our culture.

In our society, too often, prospective parents do not have the advantage of on-the-spot job training for child rearing. By this is meant that future parents do not usually have the opportunity to practice the responsibility for problem solving that will be expected of them as soon as they become biological parents. The relative ease with which divorce can be obtained promotes this avenue of escape when problems arise. Interpersonal problem solving is often toyed with and then thrown aside as families

FIGURE 2



Ingredients of a helpful allergy injection: The right solution in the right amount at the right time, given by a personable nurse or physician, who is interested in the patient and his well being

separate and individuals go their own way.

Many other social forces exist which tend to disrupt family structure and steal from a child the opportunity to learn coping techniques for problem solving. In our "instant" society, family togetherness may be nothing more than an occasional glimpse of each other over a pop tart and instant coffee. The omnipresent television set usually sees to it that spare time is not used for family communication- The result is, too often, that parents are ignorant of ways to deal with their own children, their spouse, and their own feelings. "Sponge" or "jelly-fish" parents often result.

"Sponge" indicates the great volume of abuse that this kind of parent soaks up at the hands of the children or spouse. A wishy-washy nature is characteristic of the "sponge" parent who is powerless to act to interrupt the controlling behavior of the child or spouse.

The "sponge" parent is usually also a "jelly-fish" parent. "Jelly-fish" refers to the aimless drifting behavior that characterizes these parents. They float this way or that in accordance with the behavioral currents generated by the child or spouse, rather than moving in a particular direction generated by their own efforts.

Inexperienced parents wrestling with their own problems of identity, social unrest, health, and financial equilibrium are frequently lacking in knowledge of what needs to be done to their child, as well as for him. Too often, doing to the child has been equated with harsh, punitive, negative acts. Perhaps the Hitler years of doing terrible things to others has been responsible for much of the fear that surrounds acts which do to a child and which result in effective parental management.

It is important for parents to be able to do some things for their child, some things **to** their child, and some things with their child. Parents who have children with chronic illnesses often fall into the trap of overprotecting their children without realizing it. The allergic conditions constitute the commonest chronic illness in pediatrics. "Sponge" and "jelly-fish" parents frequently fail to strike a favorable balance between doing for their children and doing to them. Doing to a child for his own benefit usually fosters the child's independence and maturity. Doing for a child usually fosters immaturity and dependence upon others.

There are, of course, individual situations in which parents abuse their children by doing **to** them *in* unfair ways. The physically battered child has been increasingly recognized, but is much less frequent than the child of a "sponge" or "jelly-fish" parent. A most frequent situation in the author's experience is for parents to abuse their children by failing to do **to** them what is required. It is in these families that the administration of allergy injections can have a large psychotherapeutic impact. This is especially the case when the parents have been trained to administer the injections at home.

In the author's private practice, selected parents who have been carefully instructed and supervised are allowed to give their child the allergy injections that he needs at home. This can be a means of developing a parent's ability to do something to a child which is beneficial for him. Many times it will prove to be the first thing that a parent has done to a child for which he, or she, does not feel guilty.

A considerable degree of judgment needs to be exercised in deciding whether a parent is, indeed, ready and capable of managing the injections. Most often, under carefully *guided* supervision, the parent can use the injections as a growth experience. The parent frequently develops a more favorable self-concept about his, or her, ability to interact with and to direct the child. The parent, in essence, is able to say, "I can dole out a small repetitive physical trauma (the shot) to my child and the world does not come to an end. I am capable of doing more to and with my child than I ever realized. I do not have

to be frightened and/or manipulated by my child's behavior. It is possible to chart a course and to stick to that course whether my child likes it or not. It is refreshing to know that I can 'call the shots.' Furthermore, doing to my child, in a fair way, can be responsible for a change in my child's behavior as well as mine, so I may proceed to do things with my child that I have never before been able to do."

Psychobiological Effects

Many individuals respond very favorably to treatment with allergy injections. One child with a history of chronic daily nosebleeds for many years never had another nosebleed after his first allergy injection. It is not unusual for the personality of a child to change dramatically as allergy injections are administered. In some children physical growth occurs when it had previously been at a standstill. The chronically tired teenager may have tired blood, but his fatigue may vanish when he receives proper treatment for allergy.

There are individuals who do not respond favorably to this treatment. Although the number is small when patients are properly selected, some individuals experience a worsening of their allergic problems during the administration of allergy injections. In these cases, the make-up of the treatment solutions, the strength and frequency of the injections, and the environmental setting around the patient must be carefully assessed. In addition, the patient's mental viewpoint may effectively interfere with the attainment of a favorable result.

Although it is difficult to identify the contributions of mind over matter, or matter over mind, it appears that many favorable results stem from a combined biological and psychological effect. When one expects success he is more apt to find it than if he looks for failure. The most favorable biological effect of a treatment may go unnoticed if the patient's mental viewpoint is not prepared to accept the favorable result. It has been reliably shown that the mind can profoundly affect the autonomic nervous system, the endocrine glands, and other bodily systems. In many cases the patient must be prepared to let something happen before it will happen. Dr. Peter Lindner (1974) writes in regard to the treatment of obesity, ". . . he must have the proper mental set. This is what I call expectation."

The best results with allergy injections are obtained in those patients with a favorable attitude toward treatment. This emphasizes, as it must be emphasized again and again, the importance of what one brings to a situation. If one comes into treatment with serious doubts and misgivings about the treatment he may be seriously jeopardizing his chances of responding favorably to it. The expectation of success tips the scales toward a favorable result.

This should not be construed to mean that one should overlook unfavorable reactions or results from the treatment. If and when these occur they must be dealt with as indicated earlier in this paper. It may even be necessary to stop allergy injections in some patients because of unwanted side effects. When patient selection is proper, however, this is quite rare.

The important thing for the allergy patient who wishes to rid himself of symptoms is to free his mental mechanisms of constraining patterns that might interfere with the possibility of a favorable biological response. It may be necessary to pry loose such mental viewpoints by means of psychological or psychiatric help, or by giving nutrients, tranquilizers, antidepressants, or megavitamin therapy.

In some individuals a profound change in mental viewpoints arises as the result of the allergy injections themselves. Unfortunately, there is no way known to predict such a favorable mental response.

When the injections bring about improved bodily function an improved mental attitude is also likely to emerge. When one feels better his mind may be

more alert and he is likely to be better company with those around him. Alleviation of sinus headache, sore throat, tics, postnasal drip, cough, wheeze, sneeze, diarrhea, or itching is often attended by a lifting of spirits that allows one to participate in life's more rewarding activities. The pollen sufferer confined to a filtered-air bedroom, for example, may after successful immunotherapy find that he can remain outdoors, drive a car, engage in a sport, or make love to his wife without developing allergic symptoms.

Summing Up

Allergy represents an attempt on the part of the body to rid itself of foreign particles such as pollen, dust, mold, etc. This hypersensitivity (allergy) may be more injurious to the patient than the presence of the relatively innocuous foreign particles that set it off.

Allergy injections consisting of antigens (allergens) to which the patient is sensitive are administered to the patient in gradually increasing amounts. This is variously termed desensitization, hyposensitization, or immunotherapy. It is a successful method of reducing the overactive defensive response of the body to the presence of foreign particles. Allergy injections represent one method of turning down or turning off the inappropriately overactive immune system.

It may be possible to lessen or eliminate an allergic condition in some patients by other means. Avoidance of offending allergens, dietary change, and the use of anti-allergy medications may be useful procedures. In addition, psychological counseling, improved nutrition, provision of exercise, visual therapy, etc., may in some patients be responsible for disappearance of allergic symptoms.

When a course of desensitizing allergy injections is given, biological, psychological, and psychobiological factors may all be responsible for the changes that occur.

There are some patients who could be helped by treatment with injections of sterile water or sterile saline. Much of the help that the patient would experience would derive from the physician's confidence in the power of these injections to help the patient.

There are many patients who are allergic, but who need forms of treatment other than allergy injections.

There are many patients who desperately need as much allergy vaccine administered to them as they can get, given gradually via successive serial injections that are properly supervised.

There are those individuals whose mental viewpoints are rigidly fixed in a negative manner. In such persons, a favorable biological result from allergy injections might not result in alleviation of allergic symptoms because of the blocking effect of the mental viewpoint.

The task of the physician is a difficult one. He must diagnose the patient's disorder and differentiate it from a host of mimicking conditions. Then he must select the most appropriate form of treatment for the patient, considering both the characteristics of the disorder as well as those of his patient.

In order to treat the patient with a good chance of success, the physician must be knowledgeable about the treatment methods available to him, how they work, and what they do.

This paper has pointed out the specific as well as the nonspecific aspects of treatment that may be involved when a patient is treated with allergy injections.

The general principles discussed in this paper pertaining to the treatment of patients with allergy injections may also be applied to other treatment measures. Biological effects, the helmsman effect, other psychological factors, and the ability of a mental viewpoint to impede favorable response may all apply as important variables in other treatment procedures. Wise is the physician who is acutely aware of the power of these variables as well as the important details of the treatment that he is using.

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