

# *Butterworth Prize Essay*

## THE ART AND SCIENCE OF PROGNOSIS IN GENERAL PRACTICE

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*Caythorpe, Lincs.*

“ For we know in part and we prophesy in part.”

*I Corinthians, 13: 9.*

Turning back the pages of history, the physician will read and learn about Hippocrates and if he studies his writings he will turn to a book entitled *Prognostic*. In the preface of this work are written these words: “ I hold that it is an excellent thing for the physician to practise forecasting . . . for he will carry out treatment best if he knows beforehand from the present symptoms what will take place later.” Hippocrates was essentially an acute observer of disease in the human being for he possessed no diagnostic instruments and the only treatment was empiric and hampered by the pagan ritual and religious beliefs of the time. Many of the aphorisms are descriptions of prognostic signs whose truth is still apparent today. Nearer our own time, Sir James Mackenzie was interested deeply in the subject of prognosis and once remarked: “ No doctor lives long enough to write a reliable book on prognosis.” The truth of this may be inferred from the fact that though there are innumerable text-books on diagnosis there is hardly one on prognosis. Taking heed, the writer of this essay will confine himself to a consideration of the science of prognosis as a scientific method and the art of prognosis as a part of the art of good general practice.

In defining prognosis, Ryle described it as “ a visualization and reasoned presentation of all the events which are likely to mark the future course of a particular disease affecting a particular patient, and not a mere forecast of duration and outcome.” If one studies this statement in conjunction with that of Hippocrates quoted above, one is impressed immediately by the insistence on foreseeing the future as an essential discipline of good medical practice. It is better described, perhaps, as clinical watchfulness. The doctor may be called to an obese, hypertensive, old man with acute bronchitis. Before instituting treatment he will consider, for a moment, the possible developments which, in this particular case, would be extension of the infection into bronchopneumonia and cardiac failure. Bearing these possibilities in mind, the doctor's treatment will be designed to prevent these complications as well as to treat the primary condition. Furthermore, at each subsequent

visit, the doctor will search for these developments, because he is alive to their possible presence, and thereby he will not be caught unawares, and will ensure for his patient the best possible chance of recovery.

Surely, then, it behoves one to study prognosis and to ask oneself the question, "What does the future hold?" for the patients one sees in the course of the day's work. The answer is often simple and straightforward, but often it is not so easy and will be discovered only after much thought and the passage of time has shed more light on the future. Nevertheless, the assessment of prognosis should be the result of careful scientific observation and thought. Just as the diagnosis depends on accurate clinical observation with careful assessment of the data so obtained, so should the prognosis. Just as one searches for diagnostic signs, so one may search for prognostic signs which may presage good or ill. Prognosis is the logical consequence of diagnosis and the techniques used to assess them are very similar. What makes prognosis so much more difficult is the problem anyone has in forecasting the future accurately, and the ever-present possibility of some unaccountable factor intervening.

Ryle and Murray Lyon have both criticized the insufficient emphasis on prognosis in undergraduate teaching, and this is still largely true today. The young doctor entering general practice for the first time is equipped reasonably well to make a diagnosis and prescribe treatment. But, the doctor having done these things, the patient or his relatives will ask, "When will I get better?" or "Is he going to be all right, doctor?" To the patient, the answer to these questions is often more important than the diagnosis, especially if it involves economic and personal adjustments. It is here that the young doctor finds himself least able to make the reasoned opinion that is demanded of him, and this may well cause him to be evasive in his answers. This may be excusable at first but such a course has two very distinct dangers. First, if the patient becomes aware that his questions are being evaded he will lack confidence in his doctor or will suspect that the knowledge of some fatal malady is being withheld from him. Secondly, the doctor may become evasive with himself and this will prevent him from exercising his intellect in a serious and honest attempt to learn the art of prognosis. For accuracy of prognosis requires even more skill than diagnosis and to convey to the patient and his household just the right amount of hope and sombre truth may call for real artistry. The family doctor's ability to do this requires not only good clinical acumen and up-to-date knowledge, but a real understanding of his patient and family, and experience in dealing with these situations so that confidence and trust are maintained. Prognosis involves far

more than the reasoned estimate of events but consideration of the effect on that household of these events in terms of bereavement, disability, financial prospects, happiness or sorrow, fear or hope. And here, the family doctor has the opportunity to interpret these things for them and guide them in their approach to their problems.

The question may be asked, however, should the doctor commit himself to a prognosis which may well be proved wrong? It will be argued by some that the doctor's duty is done when he has made his diagnosis and instituted therapy and that he should avoid committing himself unless the outlook is obvious. True, it is possible to conduct medical practice in this manner and give adequate medical care. But I believe that the doctor must be prepared at all times to make a prognosis as part of his clinical assessment of each case, and it is essential to do so if one is to practise that clinical watchfulness the importance of which has been discussed. Furthermore, when the doctor is asked what the future will be an answer is demanded, and hesitation or evasion on his part is not acceptable, for this will only increase uncertainty and anxiety which, in turn, will hamper the doctor in his management of the case. A prognostic opinion does not have to be proved correct in the long run, it is sufficient that an attempt has been made to put the position as clearly to the patient or his relatives as circumstances will permit.

### The Science of Prognosis

Having stated that a prognosis can and should be a scientific conclusion, I will now examine the sources of the data that may be required to make such an assessment. The following list shows the main sources:—

- Diagnosis
- Clinical observation
- Experience
- The Natural History of Disease
- Pathology
- Vital Statistics
- Influence of Therapy

**DIAGNOSIS:** Prognosis is the logical successor of diagnosis in the process of clinical observation and deduction, and it is axiomatic that a reasoned prognosis cannot be made unless there is an accurate diagnosis. This is the key to the whole problem and without it no prognosis can be made. There is one exception, for one meets occasionally with a complex of symptoms and signs in a patient, the cause of which is not known but the condition of the patient is so serious that the eventual outcome is obvious.

**Case 1.** A middle-aged man presented himself at the surgery for the first time complaining of breathlessness. Clinical examination was negative apart from a blood pressure of 190/110. I prescribed phenobarbitone and sent him for a chest x-ray. Two weeks later, before the radiological report was received, he returned to the surgery saying he was much worse and his legs were swelling.

Examination now revealed gross oedema of his legs, some ascites and considerable enlargement of the liver. Though he had a tachycardia, he was not cyanosed, there was no neck vein distension and his apex beat was not displaced. Obviously, some rapid pathological process was producing this clinical picture of lower mediastinal obstruction, and catastrophe was imminent. He was admitted to hospital without delay, but his condition deteriorated rapidly and he died suddenly a few hours later. Post-mortem examination revealed a very rapidly-growing anaplastic bronchogenic carcinoma filling the mediastinum.

### Clinical Observation

Just as history-taking and clinical examination are the basic essentials for making a diagnosis so are they equally essential for making a prognosis. Prognostic signs like diagnostic signs are of little value in themselves unless they have been related to all the other data in the case. For instance, the finding of a third heart sound (triple rhythm) when examining a healthy person is of no significance, but its presence in a patient suffering from cardiac failure is of serious prognostic import.

Except in the simple and common illnesses that form the bulk of our work, time may be required before a diagnosis can be made. The doctor may be called to a child complaining of abdominal pain and vomiting; after a careful history and examination he excludes an acute abdomen, but may be uncertain of the correct diagnosis, and will return the next day before he makes his final diagnosis. Time is even more important for making a prognosis. It may be exceedingly difficult to make an accurate forecast on one consultation, for only after several consultations can the physician observe the pattern of the patient's illness and his response to treatment. This is particularly true of patients suffering from cardiac failure. The doctor may be called to an elderly lady who complains of severe breathlessness and swelling of her ankles. She is known to have had rheumatic fever as a child and has mitral stenosis. On examination, she is orthopnoeic, cyanosed, with gross oedema of the ankles and sacrum. The pulse is rapid and irregular, the neck veins are distended, the heart enlarged with the signs of mitral stenosis and auricular fibrillation, the liver is enlarged and the urine is scanty and contains albumin. Untreated, the prognosis is poor. Having prescribed treatment, the doctor watches for prognostic signs. He will look for a falling pulse rate and pulse deficit, indicating response to digitalis. He will hope for an increasing urinary output and the disappearance of albuminuria, accompanied by decreasing oedema. On the other hand, the signs may increase in severity with the onset of restlessness and delirium due to cerebral anoxia so that he knows the end cannot be long delayed. It is upon observations such as these that he will base his prognosis, and enlighten the relatives accordingly.

Good history-taking can give the clinician many clues to prognosis. While taking the history the physician will be noting

such facts as age, habits, past and present disease, economic status, environment and family history.

*Age.* The extremes of life influence the prognosis adversely in the acute infections: malignant growths in children and young adults spread more rapidly. Old age affects the prognosis adversely in diverse conditions by virtue of the degenerative processes, particularly cardiovascular, associated with it. But all doctors are familiar with the amazing recuperative powers of old people, even after a serious illness.

*Family History.* Different families vary tremendously in their longevity and constitutional resistance to illness, and certain diseases have a hereditary tendency.

*Past and present disease.* Knowledge of such diseases as rheumatic fever, chronic nephritis, tuberculosis or diabetes mellitus are of great importance and may affect diagnosis, therapy and prognosis. Diabetes causes many complications to follow in its wake and their appearance worsens the prognosis.

*Habits.* There is little need to discuss the effects of chronic alcoholism, excessive smoking, or unhealthy living in lowering the general resistance of the body. One is constantly dealing with patients who, for some reason, cannot or will not accept advice on these matters. In these circumstances it is wise to point out to them the dangers they are running by refusing medical advice, especially if the prognosis would be otherwise improved. But, of course, no one will deny the dying patient those pleasures he wishes even if they do hasten the end.

*Environment and economic status.* "A competent income and a tranquil existence count for much in prognosis" (Saundby). This statement needs no elaboration; and, to illustrate it, picture two children suffering from rheumatic heart disease. One is the daughter of professional parents blessed with a good home, enjoying good holidays in the fresh air, free from infection and adequately nourished, while the other is the daughter of a frequently unemployed labourer, living in two rooms in a tenement, sleeping with three or four others in a bed, living, in fact, in conditions predisposing to recurrences of rheumatic fever. Look again at these two in thirty years' time when both are married, the former still in a good home, limiting her family, and with adequate help so that her damaged heart is not over-taxed. The other is still poor, overburdened with constant child-bearing and never-ending housework. No wonder then that she succumbs to cardiac failure before her more fortunate sister. With the steady rise in social standards, these prognostic factors are becoming less important.

*Time-relationships.* During the course of taking the history the

doctor will ask the time of onset of the various symptoms and the time they have taken to reach their present intensity, thus obtaining an idea of the speed of the disease process, which is certainly important in diagnosis and of considerable value in assessing prognosis. If a patient presents with angina he will want to know the date of onset, the frequency of attacks, and whether the frequency is increasing rapidly or not, for these facts are important guides to prognosis.

*Physical Examination.* Physical examination will reveal many important details. No attempt will be made to give a complete list of prognostic signs, as signs by themselves are of little value, and no useful purpose would be served by such a list. Suffice it to say that during his examination the doctor will be noting such facts about the patient as his general condition, obesity, nutrition, cyanosis, the decubitus, the respirations, the character of the pulse, the presence of finger-clubbing and so on. As the doctor proceeds with the examination, he will be noting good and bad signs alongside those for which he will be searching to aid him in his diagnosis.

*Mental and Emotional Capacity.* As a result of the consultation, an assessment will have been made of the patient's mental and emotional capacity. This may be necessary for diagnostic purposes and may influence therapy, but it will certainly influence prognosis. Is the patient an optimist or a pessimist? Has he the will to get better? Is he intelligent and co-operative? Here, too, social custom and behaviour influence the patient's outlook and reaction to his illness. In less highly-developed societies than ours with little or no social welfare, or in circumstances where no help is available, a man must strive either to recover from his affliction, or surrender to it. In our modern society, the weak are protected and it is accepted social practice that a man who receives an injury or suffers an illness attributable to his conditions of work will receive compensation or sickness benefit. Without in any way questioning the validity of this practice, every practitioner will have experience of patients for whom, theoretically, a good prognosis is assured, but who, either by failure to co-operate in treatment or for some other reason, never make a full, functional recovery. It is often these patients who are most insistent about receiving adequate compensation. Then there is the patient who has suffered a long and debilitating illness which, though cured clinically, has so sapped his mental vitality that he has lost the "will to work." This is a problem which is met with frequently in the resettlement of the patient cured of pulmonary tuberculosis and is aggravated by the still present, social stigma attached to the disease.

### **The Natural History of Disease**

During his clinical training, the student devotes his time to studying disease, first in the academic atmosphere of the lecture theatre, and then as it presents in the patient in the ward. Though he may not be given much formal instruction regarding prognosis, he will learn about the general pattern of behaviour of the various diseases and their complications, so that he will be able to build his experience of prognosis in the individual upon this foundation.

When considering the prognosis for a particular patient, the doctor will note the causal agent or agents—be they infection, trauma, new growth or psychiatric—and their activity. The infections vary greatly in their virulence depending on the pathogenic organisms and the resistance of the host. The remote prognosis depends on the ability of the host to overcome wholly or partly the invader so that complete healing or a chronic state will occur. Although a cure may be achieved for one episode, there may be recurring attacks of the same conditions thereafter; tonsillitis is an obvious example.

The prognosis of trauma both as regards its immediate and remote effects depends on the type, site and extent of injury. The prognosis of cancer depends on the site and type of growth as well as its rate of growth and tendency to metastasize.

### **Pathology**

A knowledge of the natural history of disease presupposes a good knowledge of pathology. The great masters of medicine like Gull and Bright constantly stressed the importance of the study of morbid anatomy, and—in our student and resident days—we always visited the post-mortem room to correlate the findings in the ward with those at autopsy. General practitioners often feel the lack of opportunity to visit the post-mortem room to confirm their clinical findings.

Clinical and laboratory tests are of little value in prognosis except in relation to the clinical examination and by indicating the severity of the lesion. Serial tests are valuable in assessing the progress of a disease, and, in general practice, simple tests such as the E.S.R. are of value in assessing the progress of a patient with rheumatic fever, tuberculosis and other inflammatory and degenerative conditions.

### **Statistics**

Statistics are of considerable value in prognosis. A knowledge of the statistics relating to morbidity, rates of recovery, the influence of a certain method of treatment, or the liability to recurrence of a certain disease, can help a doctor to assess probabilities in the individual patient's prognosis.

### The Use of Experience

Sir James Mackenzie used to be greatly impressed and surprised at the accuracy with which his partner, Dr Briggs, was able to forecast the outcome of an illness in a particular patient. Learnt by long experience and clinical observation over the years, it was essentially a personal skill, and could never be imparted fully to anyone else. Theoretically, accurate prognosis is easier for the older practitioner and in this respect the young practitioner suffers a distinct disadvantage.

The family doctor's experience of each case will be derived from three sources. The first is his knowledge of the disease in general. The second is his knowledge of the patient as a person, his occupation and his intellectual and emotional capacity. The third source is his knowledge of the patient's environment, spouse and family, their reactions to the patient's illness and their ability to care for him. Not only does this knowledge provide him with data for making a prognosis but will also guide him in the way he will advise the patient and relatives.

### Prognosis and Therapy

The aim of therapy is to achieve a good or an improved prognosis, which is another way of saying that treatment aims to cure disease, or alleviate symptoms. The prognosis of so many diseases has altered so much with the major advances in therapy in recent years that it becomes very easy to forget the normal, uninfluenced natural history of some diseases. The young doctor will rarely, if ever, see any of the common acute infections such as lobar pneumonia go through to their logical conclusion as the older doctors have done in the past. Nevertheless, an assessment of the natural prognosis is essential in the evaluation of any new therapy. This has been so often a pitfall of therapeutic trials as to need no emphasis. Peptic ulcer and disseminated sclerosis are the two diseases, *par excellence*, which have caused unwarranted enthusiasm for various drugs at one time or another because of their capacity for spontaneous remission. And we must remember that such enthusiasm has reached our patients who, grasping desperately for release from their malady, have fallen back disappointed, with fading hope and lessened confidence.

With the large number of active, potent drugs now available for our use, it is possible to predict fairly accurately the response to therapy in a particular person. Failure of the expected response prompts the doctor to ask himself if his original diagnosis is correct, or whether the appropriate drug is being exhibited. The original prognosis made at the initial consultation provides a useful base line upon which to assess the therapeutic response. Though this

mental process is made automatically by the doctor as a normal part of the consultation it is still an important part of the management of the patient.

### The Art of Prognosis

Having examined the objective factors influencing prognosis, the influence of the doctor himself must be examined and this may be termed the art of prognosis. This influence is difficult to measure but it is always present in a greater or lesser degree whether the doctor recognises it or not. It is capable of achieving great good, or great harm. It depends on the doctor's own professional outlook, on his ability to make contact and establish confidence with his patients, and—inevitably—on his own personality.

When illness occurs in a household, people are anxious—and often needlessly so—because they are dealing with a largely unknown and, therefore, fearful circumstance. Every doctor will have seen the look of relief on a patient's face when he is told truthfully that his condition is not serious and he will recover. Often, the patient has been harbouring the most fantastic ideas about the nature of his illness, and the doctor's simple, straightforward reassurance can be the most important factor in assuring a good prognosis. I am sure it is very wrong to dismiss these fears out of hand and make the patient look foolish. It is very easily done, especially if one has been called out at night unnecessarily.

Fortunately, in the larger portion of our work, the giving of prognosis is a relatively easy matter, but there will always be a group of patients whose disease is so variable in its behaviour that prognosis is very difficult and may be further complicated by the attitude of patients or relatives.

**Case 2.** I had to discuss recently with her mother the remote prognosis of a child of thirteen suffering from aortic incompetence following rheumatic fever. A cardiac specialist had stated that her life expectancy would be well into the thirties. Her mother was deeply troubled at the short lifetime allotted to the girl. I tried to point out that this was a conservative estimate provided there was no recurrence of rheumatic fever, and how the mother's efforts must be directed into encouraging her daughter to lead a full and happy life, albeit possibly shorter than the average. And again, with the great strides that are being made in cardiac surgery, who knows when operation on the aortic valves will be possible? In this way, I tried to instil hope (qualified hope) about the future lest she should be made a cardiac cripple prematurely.

I have quoted this case as an example of the difficulty of giving a prognosis and at the same time creating a hopeful and positive outlook in the patient and her mother. In this case an attitude of cautious optimism was adopted though I know all too well that this may not be borne out by events. Ryle has said that wrongly placed optimism will rarely be held against the physician, but wrongly placed pessimism will always be held against him. Naturally

this optimism must be cautious and one must consider the complications that may arise, for breezy, carefree optimism is not convincing, and if events unfold adversely great damage may be done to the physician's reputation. In serious illnesses, the position usually will be discussed with the relatives, and if the doctor's manner is one of calm hopefulness it inspires hope in them, and this hope will find its way inevitably into the sick room. Conversely, pessimism inspires despair and surrender, with their attendant evils. Even in the most hopeless cases it is wise and kind to the patient and relatives to be hopeful, for the unexpected can always happen.

**Case 3.** A previously healthy old lady of 78 had a coronary thrombosis. At first she was severely shocked and the outlook seemed poor. I decided, partly because of her age but mainly because she had a devoted family, to treat her at home with bed-rest and sedatives. They nursed her diligently and she slowly recovered and she now is fit and well, and has celebrated with her husband their diamond wedding.

**Case 4.** An old lady of 70 was found to be suffering from an advanced carcinoma of the cervix which was treated by radio-therapy. Now ten years later she is alive and well.

The importance of optimism has been discussed but it is equally important that the doctor should be convincing. It is wise for the doctor to give his prognosis in good time, and, when doing so, he should use simple, straightforward language, avoiding vague, loose terms. He must speak without hesitation and not give evasive answers. He must consider carefully the words he uses, for many terms which medical men use quite casually when discussing patients among themselves, mean something dire and frightening to the patient. It is easy to forget that a word can mean different things to doctor and patient and before a doctor labels a patient as suffering from, for example, either chronic bronchitis, asthma, cardiac failure or epilepsy, he must consider what that means to the patient. A patient's reaction on being told the nature of his ailment is guided, rarely, by reason, but usually by fear and emotion. The relative's reaction will be similar. It may be just as essential to allay these fears as it is to treat the primary conditions if one's hopes for a good or improved prognosis are to be realized. Again, how the patient is told of his ailment will influence the outcome. I am sure all doctors will have met the patient who has said, "The doctors said there was nothing they could do for me," and they will have sensed the mixture of hopelessness and resentment in those words. Though it may be necessary to tell a patient that he has a chronic disease, never must he be told that nothing more can be done for him or, equally important, that he can do nothing more for himself. The family doctor's duty must be to encourage and help him to adapt his life to circumstances. Usually in cases of

cancer and fatal disease the patient is not told the correct diagnosis though the relatives will be informed. But there are occasions when the doctor should keep the truth to himself alone.

**Case 5.** A young married woman gave birth to her first child. The paediatrician, the registrar, and the house surgeon all said, independently, that the child was a mongol. The question we had to answer was, do we tell the mother? The prognostic implications of this were so serious both to mother and child that we hesitated to speak and decided eventually to say nothing. As the paediatrician pointed out, we could be wrong, and if we were right the truth would slowly dawn on the mother and when it was confirmed later she would be better able to understand and bear it. To have told her now in her first joy at having a baby would have been cruel, and might have had serious consequences psychologically.

Thus, when, what, and how the patient and his relatives are told may be all important factors in influencing the prognosis which may be irrevocably.

But this is not easy. It is part of the art of good medical practice; the art of dealing with sick people and their relatives. This is the one part of the student's and young doctor's training that is best learnt by accompanying an experienced general practitioner on his daily round. The bulk of his education in this art will only be learnt by his own experience of general practice. It is probably the most difficult part of the young family doctor's education, because every patient is different and each situation calls for individual understanding. To master this art requires a sharply critical appreciation of one's management of each case and this should be a continuous process.

It is probably true to say that in the management of mental ill-health, the family doctor by his own ability, integrity, and sincerity can influence prognosis most effectively. Family doctors are dealing constantly with varying degrees of mental sickness. In these patients there is so very often a deep loneliness, a mental and social isolation, and they come to the doctor to establish some kind of contact. They expect him to help them in making that contact by showing understanding and appreciation of their worries, fears, and frustrations. Though the doctor may use drugs, they should be adjuvants, and it is primarily the relationship of trust and confidence that will assure a good prognosis.

**Case 6.** A young married woman of 24 years with one child aged two, complained of feeling depressed and anxious, easily bursting into tears, and being bad tempered with her husband and child. Her husband had left the R.A.F. three months previously and they were living in a small caravan. Her marriage was happy and her husband had a good job. The real problem seemed to be simply, that after one hour's housework in the morning she had nothing to do. She had few friends but her husband was averse to her working. Nevertheless, I advised her to take a job to keep her occupied while she left the child with grandmother. Phenobarbitone was prescribed. When seen again, she felt much happier and they were moving shortly into a house so that she would have more to do. This was a very simple problem but the time occupied in

taking the history was fully repaid by the results, and may have saved, incidentally, many future consultations.

The family doctor can influence the prognosis very effectually in the socio-medical field. By visualizing the future, the doctor can foresee the need for the various ancillary services engaged in family care so that when some crisis occurs he will be able to call in the services that are required. Such forethought may be of great help in the management of the elderly patient.

### Conclusion

In this essay I have tried to demonstrate the importance of prognosis in general practice, for it is surely the very stuff of good family practice, involving as it does careful clinical observation and sympathetic understanding of patients and their relatives. Diagnosis may be difficult, but prognosis is much more so, for what the family doctor says and does now may influence his patients for life. Not only that, but, as the family doctor is responsible for the continuing care of his patients, what happens to them now and his management of them may affect vitally his ability to care for them in the future, depending on the degree of trust that his patients have in him.

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**Difficult Epistaxis and its Control.** JOHN ROBERTS, M.B., F.R.C.S.  
*Practitioner*, 1958, **180**, 211.

The ear, nose and throat surgeon of the Caernarvonshire and Anglesey General Hospital describes the second "site of predeliction" for epistaxis as the point of entry of the descending palatine vessels in the vault or lateral wall of the posterior third of the inferior meatus of the nose, under cover of the inferior turbinal. Haemorrhage from this site may be severe enough to warrant hospital admission, and need special facilities for its control. Normal treatment for blood loss is advised, including transfusion if indicated; and the local lesion is approached by swabbing the nose with 20 per cent cocaine in 1 in 1,000 adrenaline solution. The inferior meatus is then packed.

The method is evidently one for an expert. Mr Roberts claims that it is much more effective than postnasal packs, or other "widely adopted and ineffective" practices.