Foxglove and chips

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William Withering

My story starts with William Withering 100 years before James Mackenzie qualified, but it is the start of a therapeutic thread which, in James Mackenzie's hands, became a life-line for his patients and a source of controversy with his cardiological colleagues. For me, the topic is an exemplar of some of the problems that beset us in our attempts to use drugs rather than to let drugs use us.

Dr William Withering, whose portrait hangs above the desk of the Dean at Birmingham, came there at the height of the industrial revolution in 1775 when all art and science in Britain seemed centred in Birmingham. I was born within a stone's throw of his home, Edgbaston Hall, now Edgbaston Golf Club but which has altered externally very little from Withering's day. He was encouraged to move there from Stafford by his friend Dr Erasmus Darwin and invited to join the ranks of the Lunar Society, so named because they met once a month allowing distant members to drive home by the light of the full moon. What a galaxy of stars the lunar society had! It is a diversion to list their names but they included Matthew Boulton, James Watt, Josiah Wedgwood, Joseph Priestley, the discoverer of oxygen, Benjamin Franklin, author, painter, inventor, scientist and, may I say, the first civilized American, and Sir Joseph Banks, the famous botanist who gave his name to plants, medals and other lectures. They were devoted to literature and science and were all men of much character and many interests.

Moving to Birmingham, Withering maintained his links with Stafford and used to drive each week to see patients at the infirmary there. At some point along the route the horses were changed and one day while this was going on he was asked to see an old woman with dropsy. He responded, as the good general practitioner is wont to do, to the request of 'While you are here doctor...', but formed a poor opinion of her prognosis. Some weeks later he saw her again and was astonished by her recovery. Upon enquiry he learnt that this was attributed to a family recipe produced by an old woman who lived up in the Clee Hills of Shropshire, the effect of which was to produce violent vomiting and purging and to which the beneficial effects were ascribed. Serendipity combined with Withering, the botanist and physician. Indeed, his contemporaries regarded botany to be his more important subject, so although the medicine was composed of more than 20 herbs William Withering said, 'It was not very difficult for one conversant with these subjects to perceive that the active herb could be no other than the foxglove.' Remember that in 1775 virtually nothing was known of pharmacology and that the curative effects of plants was shrouded by an outlook of magic and mystery. There is to this day no knowledge of how he knew which was the active ingredient.

The discovery of digitalis

So was discovered one of the few drugs whose value was established at the beginning of this century and still exists in common usage today. Withering used to see between 2,000 and 3,000 poor people a year in his house in Birmingham and it was upon these that digitalis was first tried. They were the subjects reported in An account of the foxglove and some of its medical uses...
printed in 1785 (Figure 1). Withering's painting of the foxglove appeared as the frontispiece to his book (Figure 2). It was the first scientific treatise on the treatment of disease written in the English language and Figure 3 shows that foxgloves still bloom in the grounds of Edgbaston Hall, descendants of the plants that Withering placed there and from whence he sent the seeds to America. So begins the thread I wish to trace, but before I proceed further, allow me the second of my diversions.

**Polypharmacy**

Polypharmacy is thought by some to be a product of modern prescribing. The emergence of the old lady from the hospital burdened by upward of 10 preparations to be continued without thought by her general practitioner is held by some to be the archetype of the doctor of the late twentieth century. But Withering's first concoction contained 20 separate herbs and that this was normal for prescribing throughout the eighteenth and nineteenth centuries can be seen from any examination of contemporary writing. Richard Smith, a noted Bristol surgeon in the early nineteenth century, described how a family from Clifton in Herefordshire could not move without taking their medicine with them. When they journeyed to Weymouth they took with them 200 'tonic draughts' and 1,000 pills of various sorts—the assistant told him he was 'sick to death of rolling them'. The family doctor's charges in those days were made for their prescriptions and not for their visits, which largely accounts for the long-winded prescriptions which abounded. From the apothecary's point of view it was the 'golden age of physic' but who knows what drug interactions and adverse events occurred in those days.

**Figure 1.** Title page of William Withering's book printed in 1785.

**Figure 2.** Withering's painting of foxglove used as frontispiece to his book.

**Figure 3.** Foxgloves in the grounds of Edgbaston Hall, descendants of the plants that Withering placed there.
James Mackenzie

Terence East said James Mackenzie was really the man who revived the rational use of digitalis and raised it from the cloud of disrepute under which it had fallen. Curiously, An account of the foxglove was also a pharmacological protest against abuse of the drug which was creeping in with Withering's time, as the preface showed (Figure 4).

Action of the drug

In the 100 years that had elapsed since the publication of An account of the foxglove it had been held, by those who used it, to be the effect of vomiting produced by the drug, its action on inflammation, or its antipyretic effect that was beneficial. Almost an equal number held that it was too dangerous to use, and it is extraordinary how it ever escaped from the controversy that surrounded it. It was Mackenzie who noted that hearts showed little response to digitalis when the rhythm was normal but became extremely sensitive after the onset of fibrillation. There were two concepts of the action of the drug. One, supported by Mackenzie, Cushing and Lewis, was that benefit was due to poisoning of the atiroventricular conduction system and to vagal slowing of the heart, thus giving rise to an improvement in stroke volume. The other, associated with equally eminent men, ascribed it to a direct effect upon the myocardium.

Influences of the two men

My choice of William Withering as the name to open the Mackenzie lecture stems not only from his relationship with the city in which I work but also from the man. In Mackenzie's biography, aptly called The beloved physician, McNair Wilson noted the extraordinary affinity and similarity between the careers, character, determination and originality of the two men. They were two of the most important influences in demonstrating the relationship between pharmacology and therapeutics, and between drugs, doctors and diseases. It has become fashionable to decry the use of drugs in the management of disease and it is true that the balance between cost and benefit is difficult to achieve. The pharmaceutical industry is blamed for its profiteering, the profligate prescriber for his laziness and the consumer for his weaknesses—literature abounds with examples of those who join in the general castigating; Oliver Wendell Holmes wrote that 'if the whole materia medica, as now used, could be sunk in the bottom of the sea, it would be all the better for mankind and all the worse for the fishes'.

Use of drugs

This is, in part, an understandable reaction to expectations that have flown higher than achievement. It has been difficult for the public, dazzled by the achievements of Ehrlich and the magic bullets—"substances which have an affinity for the cells of parasites and a power of killing them greater than the damage such substances cause to the organism itself"—to realize that for most problems there cannot be such specificity. In part, it is an emotive response to the word 'drug' which has a pejorative association with the 'drop-out', with the person 'under the influence of drink and drugs' and with 'the addict'.

There are other reasons. Our own College has repeatedly attested to the equal importance of psychological and social factors as components of ill-health for which drugs have little or no contribution to make.

Better prescribing

There is little doubt that better prescribing is synonymous with less prescribing. I suspect that here the general public is in advance of their doctors. Now many patients will say, 'I would rather not have drugs if possible, Doctor.' Stimson and Webb quoted the patient who says, 'One of these days, Doctor, you will give me the prescription before you ask me how I am.'

But not prescribing takes more time; there is more explanation to be made and it is my personal rule that the door must always be left open. 'Come back if you are worried—we can always change our minds.' My experience is that this is what patients feel is right and they do not often have to come back. In spite of this taking more time, however, it may be the busier doctors with the largest lists and the shorter consulting times who prescribe less anxiolytics than those less busy. What explanation can there be for this?
Unbalanced reporting

The pharmaceutical revolution has brought massive clinical benefit to patients of all ages but a major effect of our overprescribing and our irrational prescribing has been to increase the incidence of adverse reactions one of which is that the public, encouraged by some examples of unbalanced reporting by the media, is led to believe that nearly all medication is dangerous. Many of us must have patients who were deeply upset when Opren was withdrawn. Had it not been overpublicized, and consequently overprescribed, and had it been more effectively monitored, we might still have it as a valuable drug when carefully and selectively used. More recently there has been a media onslaught on the Pill which has demonstrated the dangers of simplifying complex problems. This reporting must also be partly responsible for the vogue for ‘alternative medicine’—something that may be a safer placebo than most of our conventional therapy but has so far singularly failed to pass the accepted tests of scientific validity.

The role of the general practitioner

As the range of effective medications has increased, the role of the general practitioner in this triangle of drugs, doctors and disease has grown larger. Some 90 per cent of all drugs used are dispensed against the prescriptions written by us. The cost of the pharmaceutical services has risen faster than the cost of the National Health Service in 30 years (Figure 5) and continues to rise at 2.5 per cent compound per annum. The number and cost of prescriptions has shown an inexorable tendency to increase yearly (Figure 6). If doctors feel ambivalent about this upward trend so do our patients. While some are vocal in their criticism of us for overprescribing, the truth is that the thirst of people at large for medicines is far from being slaked. Dunnell and Cartwright\(^9\) in a survey of nearly 2,000 people over a two-week period found that two thirds of adults and one half of children had taken two nonprescribed items for every prescribed item they had consumed. We are, as Sir Derrick Dunlop wrote, ‘a medicine swallowing people and it is in the nature of medicines to put at risk those who have recourse to their healing powers’.\(^10\)

Measuring the benefit of drugs

How then are we to use drugs to maximize their benefits and minimize their disadvantages? First, I must amplify what I mean by benefit. Most earlier studies concerned with the benefit of medicines have concentrated on their economic effects or their influence on mortality. Professor McKeown in his Rock Carling Fellowship in 1976\(^11\) demonstrated that the fall in mortality from the end of the seventeenth century until today was due prominently to less deaths from infectious diseases (Figure 7). Furthermore, he showed that medical measures had had little effect on the death rate prior to 1935 and that even since that date antibiotics had been less important than other measures such as the standard of nutrition. This is particularly well illustrated by one graph of the mean annual death rate from tuberculosis (Figure 8). He concluded that there is little evidence of substantial improvement in the quality of life—we are still unable to treat mental subnormality, most psychiatric illnesses and the common cold. I believe that this bleak picture of medical endeavour can be challenged: to include 150 years of history is likely to have the benefits of antibiotics overshadowed by a simple measure such as washing hands applied 100 years ago; furthermore,

**Figure 5.** NHS expenditure per head of population at 1975 — constant UK. Source: Office of Health Economics.
conferred costs their increase Evaluation are do about grumble and gout and duodenal, asthma, greater, even the disease, how the people's attitudes and of the problem, upon the disease, coincides both with the hospitals use useful antibiotics, obscures our medicines, upon the improvement in the people, kept hospitalization out. For many factors, are sickness absence for respiratory disease with more useful antibiotics and with cleaner air and changes in people's attitudes to work. When we look at specific disease, the problem of obtaining hard quantitative data on how the quality of life is affected by treatment is even greater, but few doctors would doubt the benefits conferred by oral diuretics, drugs for the treatment of asthma, gout and duodenal ulcer, the antidepressants and even the malignent benzodiazepines. (Doctors might grumble about the last-named but many of those who do are not averse to seeking their help for themselves.)

**Evaluation**

The increase in potency of drugs and the increase in their costs arise at a time when resources for health care are diminishing. It is imperative that we divert more of these scarce resources into evaluation: we need more, rather than less, research and we particularly need good clinical trials to determine which of our treatments are of value and are cost effective. Certainly these trials need surer measures for estimating benefits than those we currently employ, and general practice is the place to develop these tools. The level of the blood pressure and the tracing of an exercise electrocardiogram (ECG) tell us little about quality of life. Donabedian, 12 15 years ago, cautioned us to distinguish between process and outcome but the tools we use today are embryonic.

Fries'3 and his colleagues, in an interesting study from Stanford University, looked at a multiplicity of outcome measures in 500 patients with arthritis in terms of death, discomfort, disability, drug toxicity and cost and showed how it was possible to measure true benefit. We need to develop more sophisticated and well-validated measurements to accompany all our therapeutic interventions.

There is another side to evaluation. The beta-blockers, for example, have proved to be effective agents for lowering the blood pressure and for suppressing some of the symptoms of acute or chronic anxiety, but most of us are well aware that patients who are under treatment may not seem so well in other ways. Even my marker, digoxin, as I shall show later, seems to make more than half of those who take it feel unwell. Can we any longer neglect careful evaluation of this aspect in our balance of cost versus benefit? Let me illustrate this with an example from my own practice:

We were asked to take part in a clinical trial of a drug used for asthma. S.J. is an only child. For almost all of his eight years...
he has been 'chesty', encouraged by his mother to avoid games and outdoor exercise and dosed with every sort of linctus and cough medicine. He announces his arrival in the practice by yet another attack of bronchitis for which his mother requested 'the usual antibiotic, please'. His peak flow was almost unrecordable but his response to bronchodilator nebulizer in the home was dramatic. Six months later the combination of education, confidence and medication had made him twice the child he was and had enormously altered the family dynamics. But the clinical trial only sought to measure and record peak flow morning and evening and the consumption of bronchodilator drugs.

Such are the 'abstracts and chronicles of time' that deserve better documentation of their effects on the quality of life and a better fate than to be buried in unnecessary prescribing. Even so, it is difficult to recognize these drugs as those castigated by Brian Inglis and Ruth West in their series in The Times advocating alternative medicine. Of course steroids are dangerous if misused and so are bronchodilators. Certainly asthma is underdiagnosed and often poorly treated. We cannot 'cure' it in the accepted sense, but if we use our drugs well we can make changes in the quality of life.

Clinical trials

The action of the College in making a positive commitment to high-quality clinical trials and to postmarketing surveillance through our own Medicines Surveillance Organization would, I believe, have given James MacKenzie much pleasure. We need many more doctors and practices to become involved; it requires great commitment but the advantage to the doctor is intellectual stimulus, and I have little doubt that this is reflected in the practice. The clinical trial on asthma, of which I spoke earlier, revealed to all participants that many of their asthmatic patients were much more severely handicapped than they had realized. Adults with a peak flow of only 150 litres per minute denied having any problems but, on questioning, this was shown to be due to the adjustment they had made in their lives. They did not do gardening, make beds or carry shopping. Another trial carried out on patients with angina revealed that many patients in the trial practices were being inadequately treated with beta-blockers, and yet others who regularly took their sublingual nitrates prophylactically no longer had pain on exertion and no longer had angina when the prophylactic therapy was withdrawn. Because of our unique registration and record system this surveillance is one way in which we can make a major international contribution towards drug safety.

Unnecessary prescribing

There are many factors concerned in unnecessary prescribing. On average, general practitioners prescribe in about two thirds of their consultations but this proportion conceals doctors who prescribe in 96 per cent of their consultations and others who prescribe in less than half. The same degree of variation in prescribing habits is to be found within specific drug subgroups such as psychotropics or antibiotics. We use up to 500 different preparations throughout a year although more than half of these are only prescribed once or twice. Thus we have a residual of about 150 drugs that we commonly use.

Repeat prescribing

The bulk of our prescribing falls into this category. There is variation in the meaning applied to 'repeat prescribing' but most of us understand the system by which patients on longterm or intermittent medication obtain further prescriptions without seeing the prescribing doctor. On average just over two thirds of our prescribing is done in this way. It has been shown to be convenient for doctors and patients, and critics must recognize that the doctor who issues more repeat subscriptions but carefully checks the well-being of his patient once a year may be practising more carefully than his colleague who sees his patient once a month and issues a prescription without ever thinking about what he is doing. But there can be no doubt that any system which encourages a group of doctors at the end of a busy surgery to sign hurriedly handfuls of scripts prepared by others does not allow thinking processes to accompany the act. It is a system designed to keep the pharmaceutical train in motion, not to stop it, scrutinize and question whether the journey is necessary. In a survey carried out in my own practice in 1980 we reviewed what was happening to our patients who were receiving prescriptions for digoxin. We discovered that 44 per cent had not been seen in the previous six months and 19 per cent were not seen in the previous 12 months. Some patients had not been seen for several years.

Reasons for prescribing

Conrad Harris and John Howie have exposed ineffectual prescribing. Sometimes we prescribe because we have nothing else to offer; sometimes the prescription is a connecting thread in the necessary relationship; sometimes the prescription says 'goodbye' when other ways would be more hurtful; sometimes society is pressing us to help people to live with changes. Of course, we now well understand that prescribing is not the simple action of a scientist who provides a specific chemical to remedy a symptom or disease. The sociology of prescribing is complex. Balint and colleagues' book Treatment or diagnosis needs to be read and reread by us all.

But in a world of drug interaction and adverse reaction can we afford to behave in this way? Such prescriptions may have been acceptable when the contents were bland, harmless and ineffectual. What place have they when there is a choice of such potency? What place have they when profligacy threatens to erode other services that we provide, or when a 10 per cent cut in our prescribing costs could fund new hospitals each year or many more nurses or home-helps within the community? Hampton has written that clinical freedom is
dead and no-one need regret its passing. He must be right. Clinical freedom based upon opinion is not good enough today. We must use knowledge better, and if this means having limited lists of drugs, accepting generic prescribing or being required to discipline ourselves within our groups then so be it. I believe the time has come when the profession would accept this and I believe the public would also accept this. A leading article in our Journal\(^1\) said five years ago, 'A prescription for diazepam is beginning to look like the doctor's excuse for not listening to the spouse or family.'

**Promotion of drugs**

There is a tidal wave of opinion and fact about drugs that washes over the general practitioner. During the month of August I received material that in postal charges alone cost more than £4. If consistent throughout the year and mailed to all general practitioners the cost would be more than £1,250,000. I do not know of any good evidence that our prescribing behaviour is altered by such information. It seems that only the warnings in the *Adverse reaction* series, published by the Committee on Safety of Medicines and reserved for serious events, have an effect upon the total volume of our prescribing of a particular drug. Added to the literature that is mailed to us, there exists at least 24 encyclopaedic books about modern drugs, to which must be added another 20 that concentrate on special aspects of drug action, 23 on adverse effects and interactions and eight on poisoning—sufficient to fill the shelves of any good practice library and costing, I estimate, over £2,000.

**Problem areas for general practitioners**

I suggest that the pharmaceutical revolution has been associated with two major problem areas for general practitioners—problems associated with our own attitudes and problems associated with information—both of which are associated with unnecessary and inappropriate prescribing.

I would be the first to admit that the attitudes of patients are of equal importance even though I do not touch upon them, but let me begin with the attitudes that shape our behaviour. How can we make our prescribing more rational? James Mackenzie was quite clear what should be done: in 1919\(^2\) he wrote, 'Each time a drug is given the teacher must give the reason for presenting it;' he further added that if this were done 'he would prescribe for his patient with greater intelligence.' If you will regard us all as teachers—that, of course, is the real meaning of the word 'doctor'—then the way is clear. It is only by observation and scrutiny of our own behaviour and an analysis of the reasons behind it that we can make rational change.

There can be no doubt that continuing education in therapeutics in general practice is firmly in the hands of the pharmaceutical industry, arguably the largest modifier of doctor behaviour in the UK. This is not surprising for two reasons. First, the sheer volume of effort expended. I calculate that in 1979 £92 million was spent on promotion to general practitioners by the pharmaceutical industry; £3,500 per practitioner. In the same year a total of £1.27 million, or £50 per practitioner, of section 63 monies was expended and not much of this was on therapeutics. The second reason is that of territory. The centre of the pharmaceutical industry's approach is that of 'inpractice education'. This assault upon the senses, and I do not mean this to be a pejorative phrase, is carried out by letter, by advertisement, by face-to-face contact with representatives (averaging 50 per year per doctor), by invitations to take part in studies and by the sponsored lunchtime meeting at which a low profile is often kept by the representative.

Now this is a method of influencing attitudes and behaviour that has been largely neglected by traditional medical education. Yet we are flirting with it. The term 'audit' is still one to make strong men pale. Sheldon in his Butterworth Essay of 1981,\(^3\) provided what for me is the best definition of audit yet. 'It is,' he wrote, 'a study of some part of the structure, process or outcome of medical care, carried out by those personally engaged in the activity concerned, to measure whether set objectives have been attained, and thus assess the quality of care delivered.' Much more accurate than my own paraphrase, which is, 'looking at what we do to see if we can do it better.'

The obstacles to audit include lack of time, the difficulty of measuring 'good' general practice, the fear of it being used by others to control us, and the paucity of our records. But surely the greatest obstacle is the teacher who mocks and bullies the medical student in public, and who in teaching by dogma destroys the innate questioning behaviour of the intelligent young. The answer must lie with those who teach the student and those who train the new entrants to our discipline. This is where the ability to change must be developed.

Even if we do not carry out the audit ourselves, are we influenced in our behaviour by the published results of others? As an example, let me return to the foxglove. The controversy about its place in treatment is not resolved; the therapeutic role of digitalis after myocardial infarction is still a contentious issue 70 years after Herrick\(^4\) advised giving it to all patients with this condition. It certainly produces a short-term improvement in contractility and is of proven value in atrial fibrillation, but the value of long-term use in patients in heart failure is uncertain. In 1970 Dall\(^5\) showed that it could be stopped in three out of four geriatric patients in sinus rhythm. Seven years later Hull and Mackintosh\(^6\) demonstrated that in a south London practice three quarters of the patients on maintenance digoxin could have it stopped without ill effect and, furthermore, most of those in whom it was stopped reported spontaneously that they felt better. Now the great bulk...
of this prescribing takes place in general practice. In 1976 about 300,000 people were on maintenance digitalis, between 0.5 and 1.0 per cent of the population of the UK; some 20 per cent of patients admitted to hospital with a medical (as opposed to a surgical) illness were on digitalis preparations. In 1982 the figure was 327,000 on maintenance digitalis, not much evidence of change. It seems to be one of the prerequisites for change that we should be able to scrutinize our own activity, or better still, have it scrutinized by others; this surely depends upon the attitudes that we developed in our early training.

**Information revolution**

I spoke of the second problem with prescribing behaviour being that of information and I have already detailed the surfeit. But it brings me finally to the 'chips' in my title. The pharmaceutical revolution is about to be accompanied by an information revolution. The problem is not about availability of information, as I have shown, but about its application to our clinical work. Pereira Gray in his Mackenzie lecture in 1977 spoke of the impact that the third technical revolution 'miniaturization' would have upon the lives and health of our own patients. Let me give you some examples of what is happening now. I have spoken of the need for scrutiny of our own activity in order to carry out audit. Each practice has, for many years, received for one month a table showing how the cost of their prescribing relates to district and national averages but this analysis says nothing about the quality of prescribing that we do and is no help to audit.

The Prescription Pricing Authority will shortly be fully computerized. It is now possible for anyone wishing to carry out a self-audit to obtain a PD8 analysis, which will in future be based on the British National Formulary (BNF) classification of drugs. This provides a mass of information allowing the doctor to compare the practice's prescribing with the average in the Family Practitioner Committee (FPC) area and to compare his own prescribing with his partners. Within each pharmaceutical group he can obtain detailed information about the quantity and cost of every drug he has prescribed. Reilly and Patten have demonstrated the effectiveness of an audit of prescribing when accurate data was available. I suggest that one of the hallmarks of good practice today is the readiness to obtain and use such figures.

**Viewdata systems**

There are currently about 2,500 proprietary names to recall and over 1,000 of these drugs are available in generic form. For each one there are several different formulations and a list of contraindications, possible side effects and potential drug interactions of bewildering complexity. Viewdata systems bring exciting possibilities. It will soon be possible to obtain detailed information via viewdata systems about all new drugs as soon as they are licensed and before they have reached the *British National Formulary*. It might be possible and desirable for management algorithms to be available in this way. A carefully phased trial on one of these in the management of acute respiratory illness has shown how the average cost of treating patients was halved, fewer investigations were done, records were better and the quality of care may also have been improved. In years to come algorithms and computers may prove to be as important to clinical practice as many other great innovations.

Every report upon computers in primary care so far published has stressed their role in our prescribing. Repeat prescriptions printed are legible, accurate and can be listed and referenced in a variety of ways. Most systems can accommodate up to nine prescriptions per patient, with each prescription able to cater for up to 10 items — enough for our most voracious pill-swallowers. Programs can use generic or proprietary names. Full management reporting allows regular audit of the nature of our repeat prescribing. Patients can obtain a printout of the drugs they are on and automatically receive printed instructions about how to manage their drugs.

The regular recall system is built in and the next step is to move into an interactive program. First, this allows automatic flagging of potential drug interactions and then, connected to a drug database, the full potential of the 'chip' is realized. Drug choices can be made from a group of similar drugs based on length of action, suitability for the individual patient and cost; or from groups of drugs used to treat a disease. We can enquire from our database about digitalis, for example, and ask what potential drug interactions may occur (Figure 9), or request an analgesic for use in early pregnancy costing less than £1 for 50 tablets; or the agreed diagnostic criteria for rheumatoid arthritis (Figure 10). What are the principles to guide me in my choice of drugs? What if I want to use sustained release preparations? The advent of the laser disc brings the potential
for storing all this information within the consulting room, and updating it regularly.

Conclusion

Time has prevented me from following the foxglove up many other interesting byways — the necessity for being more alert to adverse reaction and drug interaction, the problems of bioavailability and of generic prescribing — nevertheless I have been able to demonstrate that though much good and much harm can be done by drugs, their dangers are often exaggerated and their true benefits are often not revealed by doctors. Drug therapy and doctors are under increasing criticism and this has been in part a defence and in part a plea for better use by doctors. James Mackenzie made this search for high standards his life's work.

References


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Note

This is an edited and abbreviated version of the full 1983 James Mackenzie Lecture.

Streptococcal pharyngitis and acute rheumatic fever

A comprehensive survey of physicians, laboratories, and hospital records in Rhode Island showed that more than 157,000 throat cultures for a population of 930,000 people were done in 1980: 87 per cent of primary care physicians prescribed antibiotic therapy before culture results were known, and almost 40 per cent continued antibiotic therapy for 10 days regardless of culture results. The throat culture positivity rate for β-haemolytic Streptococcus was 17 per cent statewide in 1980. Only three definite and seven possible cases of acute rheumatic fever were identified by hospital chart reviews and a physician survey covering the five years 1976 to 1980. Current throat culture practices probably have little influence on treatment of streptococcal pharyngitis and control of rheumatic fever in the state.

Source: Holmberg SD, Faich GA. Streptococcal pharyngitis and acute rheumatic fever in Rhode Island. JAMA 1983; 250: 2307-2312.