

PAUL RUTTER

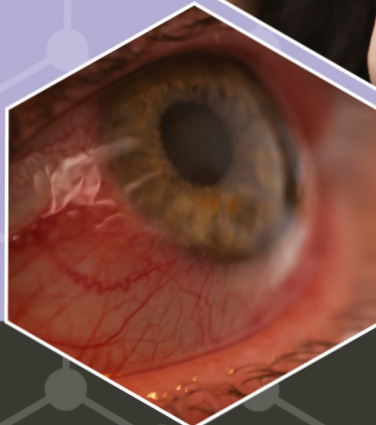


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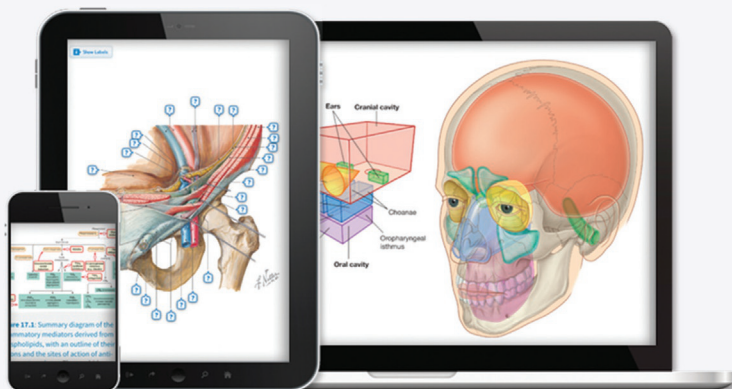
SYMPTOMS, DIAGNOSIS AND TREATMENT



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Community Pharmacy



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Community Pharmacy

Symptoms, Diagnosis and Treatment

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FIFTH EDITION



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Useful websites (addresses correct as of April 2020)

Evidence-Based Medicine

<http://www.bandolier.org.uk/>

Centre for Medicines Optimization

Centre for Reviews and Dissemination

Health Services Technology Assessment Texts (US Site)

King's Fund

National Institute for Health and Care Excellence

Regional Drugs and Therapeutic Centre

Medicine Information and Regulation

<https://www.medicines.org.uk/emc>

European Medicines Agency

Medicines and Healthcare Products Regulatory Agency

NICE Clinical Knowledge Summaries

Therapeutic Goods Administration (Australia)

UK Medicines Information

US Food and Drug Administration

Professional Bodies and Regulators

British Dental Association

British Medical Association

General Dental Council

General Medical Council

General Pharmaceutical Council

Health and care Professions Council

Pharmaceutical Society of Australia

Royal College of Nursing

Royal Pharmaceutical Society

The Nursing and Midwifery Council

UK Pharmacy Organizations and Trade Bodies

Association of the British Pharmaceutical Industry

British Pharmaceutical Students Association

<https://www.ghp.org.uk/>

National Pharmaceutical Association

Pharmaceutical Services Negotiating Committee

The Proprietary Association of Great Britain

UK Clinical Pharmacists Association

International Healthcare Organizations

International Pharmaceutical Federation (FIP)

International Pharmaceutical Students' Federation

World Health Organization

Pharmacy Journals

Chemist and Druggist

International Journal of Clinical Pharmacy

International Journal of Pharmacy Practice

Pharmaceutical Journal

Research in Social and Administrative Pharmacy

The Pharmacist

Wider Healthcare Journals of Interest to Community Pharmacy

British Journal of General Practice

British Medical Journal

Health and Social Care in the Community

Health Services Research

Journal of Evaluation in Clinical Practice

Journal of Prescribing Practice

Journal of Self Care

Nursing Standard

The Lancet

General Health Sites for Healthcare Workers

Medscape

Selfcare forum

General Health Sites for Patients

<http://www.patient.co.uk>

<http://www.healthfinder.gov/>

<http://www.bbc.co.uk/health/>

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Preface

Demand on healthcare professionals to deliver high-quality patient care has never been greater. A multitude of factors impinge on healthcare delivery today, including an aging population, more sophisticated medicines, high patient expectation and health service infrastructure, as well as adequate and appropriate staffing levels. In primary care, the medical practitioner role is still central in providing this care, but shifting the workload from secondary to primary care is placing greater demands on their time, resulting in new models of service delivery that increasingly involve other allied health professionals.

This is leading to a breakdown of the traditional boundaries of care among doctors, nurses and pharmacists. In particular, certain activities once seen as medical practitioner responsibility are now being performed by nurses and pharmacists as their scope of practice expands. The traditional role of supplying medicines safely and efficiently through the community pharmacy still exists, but greater patient-facing cognitive roles are now firmly established. Health prevention services are now routine; for example, smoking cessation, weight management and vaccination programmes. The pharmacy is now seen (by many governments) as a place where the general public can be managed for everyday healthcare needs without visiting a doctor. The most notable long-term global healthcare policy, which directly affects pharmacy, is the reclassification of prescription-only medicines to nonprescription status. In the UK, over 100 medicines have been deregulated since the

first switches took place in 1983. More recent switches have included products from new therapeutic classes, allowing community pharmacists to manage and treat a wider range of conditions.

Further deregulation of medicines to treat acute illness from different therapeutic areas seems likely in the medium to long term, especially because healthcare professional opinion to acute medicine deregulation is broadly positive, and the impact on the general practice workload associated with dealing with minor ailments is high (representing 100–150 million GP consultations per annum). Pharmacists, more than ever before, need to demonstrate that they can be trusted with this additional responsibility. Therefore, pharmacists require greater levels of knowledge and understanding about commonly occurring medical conditions. They will need to be able to recognise their signs and symptoms and use an evidence-based approach to treatment.

This was, and still is, the catalyst for this book. Although other books targeted for pharmacists about diagnosis have been published, this text aims to give a more in-depth view of minor conditions and explains how to differentiate them from more sinister pathology, which may present in a similar way. The book is intended for all nonmedical healthcare staff, but especially for pharmacists, from undergraduate students to experienced practitioners.

It is hoped that the information contained within the book is both informative and useful.

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Introduction

Community pharmacists are the most accessible healthcare professional. No appointment is needed to consult a pharmacist, and patients can receive free unbiased advice almost anywhere. A community pharmacist is often the first health professional from whom the patient seeks advice and, as such, provides a filtering mechanism whereby minor self-limiting conditions can be appropriately treated with the correct medication, and patients with more sinister pathology referred on to an appropriate practitioner for further investigation. On a typical day, a pharmacist practising in an 'average' community pharmacy can realistically expect to help between 5 and 15 patients a day who present with various symptoms for which they are seeking advice, reassurance, treatment or a combination of all three.

Probably of greatest impact to community pharmacy practice globally is the increased prominence of self-care. Self-care is not new; people have always taken an active role in their own health. What is different now is the attitude towards self-care by policy makers, healthcare organisations, not-for-profit agencies and front-line healthcare workers. Health improvements have been seen in people adopting health-enhancing behaviours rather than just through medical intervention. This has led to self-care being seen in a broader context than just the way in which people deal with everyday illness. In the UK, the self-care forum (<http://www.selfcareforum.org/>) was established; its purpose is to promote self-care and to embed it in everyday life.

So what is self-care?

Fundamentally, the concept self-care puts responsibility on individuals for their own health and well-being. The World Health Organization defines self-care as '*the ability of individuals, families and communities to promote health, prevent disease, and maintain health and to cope with illness and disability with or without the support of a health-care provider*'.

Self-care has been described as a continuum (Fig. 1), starting with individual choices on health (e.g., exercising), moving through to managing their own ill health (e.g., self-medicating) either on their own or with help. As people progress along the

continuum, more facilitation by others is required until a person needs fully managed care.

What is self-medication?

Self-medication is just one element of self-care and can be defined as the selection and use of medicines by individuals to treat self-recognised illness or symptoms. How these medicines are made available to the public vary from country to country, but all have been approved by regulatory agencies as being safe and effective for people to select and use without the need for medical supervision or intervention. In many countries (e.g. Australia, New Zealand, France, Sweden, Canada, UK), regulatory frameworks support the reclassification of medicines away from prescription-only control by having a gradation in the level of medicine availability, whereby certain medicines can only be purchased at a pharmacy. These 'pharmacy medicines' usually have to be sold by the pharmacist or under his or her supervision. Over the last 4 decades, this approach to reclassification has seen a wide range of therapeutic agents made available to consumers, including proton pump inhibitors (US, EU-wide), orlistat (EU-wide), triptans (UK, Germany) and beta-2 agonists (Singapore, Australia).

Facilitated self-medication

Most purchases of nonprescription medicines are by the consumer alone, who uses product information from packaging to make an informed decision on whether to make the purchase. When consumers seek help at the point of purchase, this can be termed *facilitated self-medication*. Where medicines are purchased through pharmacies, staff are in a strong position to facilitate self-care decision making by consumers because, in most pharmacies, the transaction takes place through a trained counter assistant or the pharmacist. Limited research has shown that consumer purchasing decisions are affected by this facilitation. Nichol et al. and Sclar et al. both demonstrated that consumers (25% and 43%, respectively) altered their purchasing decision when proactively approached by pharmacy students. Furthermore, a small

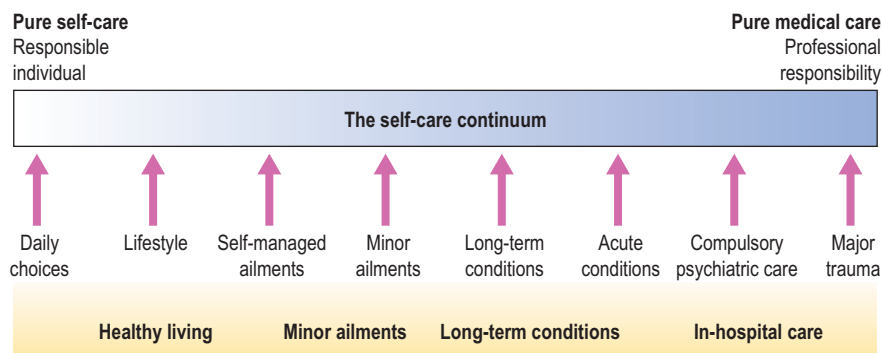


Fig. 1 The self-care continuum.

proportion of consumers did not purchase anything (13% and 8%) or were referred to their physician (1% and 4%). These studies highlight how the pharmacy team can positively shape consumer decisions and help guide them to arguably better alternatives.

Community pharmacy and self-care

Increasing healthcare costs, changes in societal lifestyle, improved educational levels, and increasing consumerism are all influencing factors on why people choose to exercise self-care. Of greatest importance are probably consumer purchasing patterns and controlling costs.

Consumerism

Changes in society have led people to have a different outlook on health and how they perceive their own health and ill health. Today, people have easy access to information; the Internet gives almost instantaneous access to limitless data on all aspects of health and care, which means that people across the globe have the means to query decisions and challenge medical opinion. This growing empowerment is also influenced by greater levels of education; having information is one thing, but being able to understand it and utilise it is another. This has proved challenging to healthcare systems and workers, having to move from traditional structures and paternalistic doctrines (e.g., 'doctor knows best') to a patient-focused and -centred type of care. This heightened public awareness about health, in the context of self-care, allows individuals to make informed choices and to recognise that much can be done by themselves. The extent of self-care is no better exemplified than by the level of consumer self-medication. The use of nonprescription medicines is the most prevalent form of medical care in the world. Sales are huge, with the global market estimated to be worth 73 billion euros.

Despite the enormous sums of money spent on nonprescription medicines, approximately only 25% of people regularly purchase them (25% tend to seek medical attention, and 50% do nothing). The extent to which this happens varies from country to country and, in some markets, this is considerably higher; for example, South Africa and the United States, where 35% to 40% of people use over-the-counter (OTC) medications on a regular basis.

Many papers and commissioned reports have shown that access and convenience shape the purchasing patterns of consumers. These factors seem to be unaffected by country or time. Reports spanning 30 years have repeatedly concluded that these play an important part in consumer decision making. The element of convenience does have a country context; for example, in Western countries, this is primarily due to ease of access that negates the need for doctor seeking that is often associated with higher cost and increased time. In developing countries, 'convenience' is more associated with 'need' due to lower levels of health infrastructure and access to medical resources.

Costs

As populations across the globe live longer lives, whether through better hygiene, nutrition or advances in medicine, providing medical care is becoming more and more expensive. In an attempt to control costs, many countries have gone through major healthcare reforms to maximise existing resources, both financial and staffing, to deliver effective and efficient healthcare. These reforms include integrating self-care into mainstream public health policy, including the management of long-term conditions.

Encouraging more people to exercise greater levels of self-care, for acute or chronic problems, has the potential to shift costs away from professional care. Figures from the UK give some indication as to the magnitude of potential

cost savings. Take primary care workload as an example. It has been reported that approximately 20% to 40% of general practice (GP) workload constitutes patients seeking help for minor illnesses at a cost of £2 billion.

Contribution of community pharmacy to self-care

Community pharmacists are uniquely placed to provide support and advice to the general public compared to other healthcare professionals. The combination of location and accessibility means that most consumers have ready access to a pharmacy where healthcare professional advice is available on demand. A high level of public trust and confidence in pharmacists' ability to advise on nonprescription medicines is afforded to community pharmacists. Although there is a general global move to liberalise nonprescription markets, pharmacies in many countries still are the main suppliers of nonprescription medicines. Pharmacists are,

therefore, in a unique position to facilitate consumer self-care and self-medication, which needs to be expanded and exploited.

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- Self-Care Forum <http://www.selfcareforum.org/>

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How to use the book

The book is divided into 11 chapters. The first chapter lays the foundations of how to go about making a diagnosis. This is followed by nine systems-based chapters structured in the format shown in Fig. 2. The final chapter is product-based and has a slightly different format. A list of abbreviations and a glossary are included at the end of the book.

Key features of each chapter

At the beginning of each chapter, there is a short section addressing basic anatomy and history taking specific to that body system. A basic understanding of the anatomical location of major structures is useful when attempting to diagnose or exclude conditions from a patient's presenting complaint. It would be almost impossible to know whether to treat or refer a patient who presented with symptoms suggestive of renal colic if one didn't know the location of the kidneys. However, this is not intended to replace an anatomy text, and the reader is referred to further reading listed throughout the book for more detailed information on anatomical considerations.

Self-assessment questions

Twenty-five multiple-choice, extended matching questions, and at least two case studies are presented at the end of each chapter. These are designed to test factual recall and applied knowledge. Most questions are constructed to resemble those in the UK preregistration examination set by the General Pharmaceutical Council.

The case studies challenge you with real-life situations. All are drawn from practice and have been encountered by practising pharmacists but have been modified for inclusion in this book.

Elements included under each condition

The same structure has been adopted for every condition. This is intended to help the reader approach differential diagnosis from the position of clinical decision making (see Chapter 1). To help summarise the information, tables and algorithms are included for many of the conditions.

Arriving at a differential diagnosis

To contextualise how commonly conditions are seen by community pharmacists, a table listing the likelihood in which they are encountered is presented. This is designed to frame the questions that should be asked from the point of working from the most likely cause of symptoms. To help further, a table summarising the key questions that should be asked for each condition is included. The relevance (the rationale for asking the question) is given for each question. This will allow readers to determine which questions should be asked to enable a differential diagnosis to be reached.

Primer for differential diagnosis

A primer for differential diagnosis is available for a number of the conditions covered. This algorithmic approach to differential diagnosis is geared towards nearly or recently qualified practitioners. They are not intended to be solely relied on in making a differential diagnosis but to act as an aid to memory. It is anticipated that the primers will be used in conjunction with the text, thus allowing a broader understanding of the differential diagnosis of the condition to be considered.

Trigger points indicative of referral

A summary box of trigger factors explaining when it would be prudent to refer the patient to another healthcare practitioner is presented for each condition. In most cases, a rationale for referral and time scale is presented. These trigger factors are not absolute, and professional judgement needs to be exercised on a case by case basis. For example, a person with a cough of 3 days' duration would not normally constitute a referral but, if the person showed obvious visible signs of being in respiratory distress, this would require referral.

Evidence-based OTC medication and practical prescribing and product selection

These two sections present the reader first, with an evaluation of the current literature on whether OTC medicine works, and second, with a quick reference to the dose of the

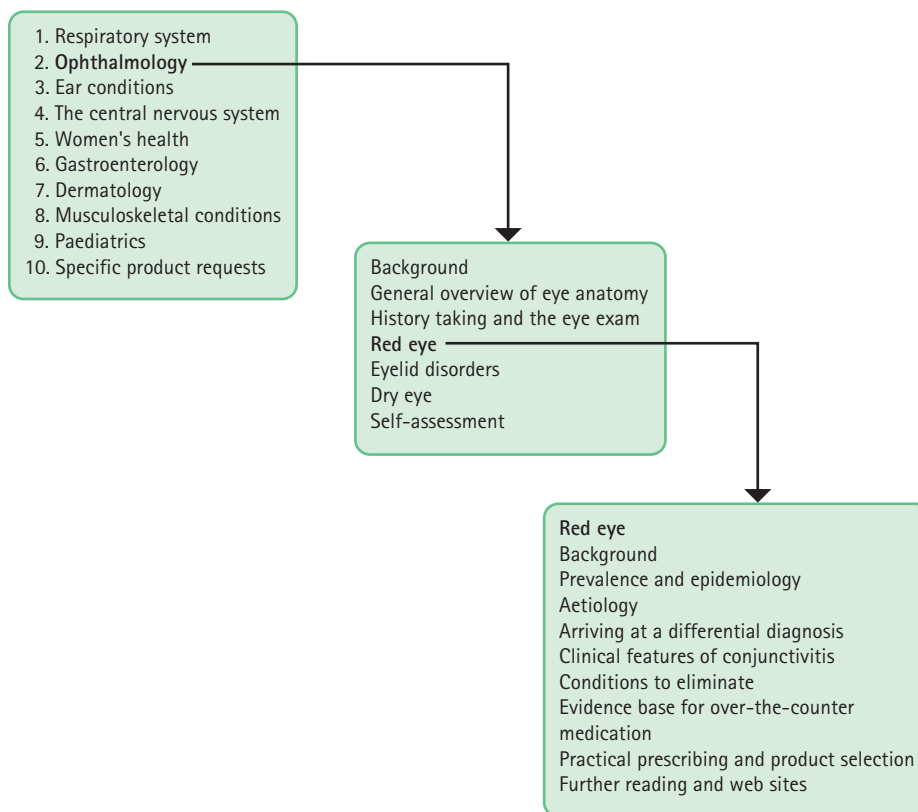


Fig. 2 Structure of the book.

medicine and when it needs to be prescribed with caution or when it should be avoided. This does not replace standard textbooks such as *Martindale* or *Stockley's Drug Interactions*, but it does allow the user to find basic data in one text without having to consult three or four other texts to answer simple questions.

Side effects listed for products are drawn from the Summary of Product Characteristics, which can be found via the electronic medicine compendium (<https://www.medicines.org.uk/emc>). Only side effects listed as very common ($\geq 1/10$) or common ($\geq 1/100$) are shown unless the product is associated with more unlikely but serious side effects of which the patient should be made aware.

The pregnancy and breastfeeding recommendations in this book are based largely on those from standard texts, such as Briggs and associates *Drugs in Pregnancy and Lactation* and, Schaefer and colleagues *Drugs During Pregnancy and Lactation*. Many manufacturers of OTC medicines advise against their products being used in these groups but, where possible, reference is made in the summary tables to the recommendations from these standard and trusted sources. This,

hopefully, will provide extra information for practitioners when faced with queries from pregnant and lactating women, and allow them to recommend products when manufacturer information stipulates avoidance.

Hints and tips boxes

A summary box of useful information is provided near the end of the discussion of each condition. This contains information that does not fall readily into any of the other sections but is nonetheless useful. For example, some of the hints and tips boxes give advice on how to administer eye drops, suppositories, and other forms of medicines.

Further reading and websites

To supplement the text, a list of selected references and further reading at the end of each condition is provided for those who wish to seek further information on the subject. Websites are

also provided, and all of these were checked, active and relevant at the time of this writing (Spring 2020).

Finally, all information presented in the book is accurate and factual as far as the author is aware. It is acknowledged that guidelines change, products become discontinued and new information becomes available over the lifetime of a book. Therefore, if any information in this book is not current or valid, the author would be grateful of any feedback, positive or negative, to ensure that the next edition is as up to date as possible.

Electronic resources

Access to additional material is hosted on Elsevier's electronic portal. The electronic resource holds additional material that includes the following:

- A chapter on evidence-based medicine
- Videos on physical examination
- Additional written case studies
- More multiple-choice questions

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Making a diagnosis

In this chapter

Community pharmacy performance when dealing with patients' signs and symptoms 1
Current pharmacy training in making a diagnosis 2
Clinical reasoning 3

Summary 4
Consultation and communication skills 6
Conclusion 7

Global health care policy now has a strong self-care focus, and various strategies have been put into place to encourage consumers to have a more active role in exercising self-care.

Pharmacies unquestionably handle and manage large numbers of consumers who seek help and advice for minor illness, and advocates of pharmacy have argued that this will decrease physicians' workloads regarding minor illness, allowing them to concentrate more on complex patient care.

The expansion of nonprescription medicines has contributed to the growth seen in the market and given consumers greater choice. It has also provided community pharmacy with an opportunity to demonstrate real and tangible benefits to consumers. For example, in the UK, government-endorsed (and funded) services such as Minor Ailment Schemes have shown the positive impact that community pharmacy can have on patient outcomes. However, research data on the effectiveness of community pharmacy staff to differentially diagnose patients is less convincing.

Community pharmacy performance when dealing with patients' signs and symptoms

Regardless what degree of control is placed on medicine availability in different countries, pharmacists can now manage and treat a wider number of conditions than ever before. This raises the question as to whether pharmacists are capable of selling these medicines appropriately. Early research of pharmacist-consumer interactions in pharmacy practice did

not address this but concentrated more on auditing questioning behaviour and analysing the advice people received (Cantrill et al., 1997). This body of work did illustrate the following: the basic nature of performance; types of questions asked; frequency of advice provided; and consumer perception to questioning. The findings were broadly critical of pharmacist performance. Over the same time period, covert investigation by the UK consumer organization, 'Which', also concluded that pharmacists generally performed poorly. (Consumers' Association, 1999).

Further practice research (mainly from developed countries) has sought to determine the outcome of these interactions rather than the mechanics of the interaction. Findings from all papers raise questions over pharmacist ability to consistently perform at expected levels. Lamsam & Kropff (1998), found that in one-third of interactions, the pharmacists made recommendations without assessing the patient's symptoms and, in a further third of cases, recommendations were poor, which could have potentially caused harm. Horsley et al. (2004) found that the expected outcome was only reached in half of observed cases. Driesen and Vandenplas (2009) and Bilkhu et al. (2013) also reported poor performance, and in each study – diarrhoea in a baby and allergic conjunctivitis in an adult – it was suggested that too few questions were asked. Tucker et al. (2013) compared pharmacist performance to doctors and nurses across a spectrum of dermatological conditions. Pharmacists performed more poorly than doctors, and only 40% of pharmacists were able to identify all lesions correctly. Data from developing countries are limited but a review by Brata et al. (2013) also highlighted inconsistent information gathering, leading to inappropriate recommendations.

Current pharmacy training in making a diagnosis

The use of protocols, guidelines and mnemonics seem to have been almost universally adopted by pharmacists. Many mnemonics have been developed, as highlighted in a 2014 review (Shealy, 2014). The use of these decision aids seems to have had little impact on improving performance, and recent research findings have shown that community pharmacists overrely on using this type of questioning strategy (Akh-tar & Rutter, 2014; Iqbal & Rutter, 2013; Rutter & Patel, 2013).

Do not use mnemonics

At best, these tools allow for standardizing information gained from patients from and between pharmacists and the wider pharmacy team. The more fundamental and important point is not simply asking questions but determining how that information is used. Having a set of data still requires interpretation, and this inability to synthesize gathered information appropriately is where research has highlighted pharmacists' failings.

Mnemonics are rigid, inflexible and often inappropriate. Every patient is different, and it is unlikely that a mnemonic can be fully applied and, more importantly, using mnemonics can mean that vital information is missed, which could shape decision making. Some of the more commonly used mnemonics are discussed briefly in the next section.

WWHAM

This is the most common mnemonic in use and is widely taught and used in the UK. It is the simplest to remember but also the worst to use. It gives the pharmacist very limited information from which to establish a differential diagnosis. If used, it should be used with caution and is probably only helpful as a basic information-gathering tool. WWHAM

Meaning of the letter	Attributes of the mnemonic
W Who is the patient?	Positive points
W What are the symptoms?	Establishes presenting complaint
H How long have the symptoms been present?	Negative points
A Action taken?	Fails to consider general appearance of patient. No social or lifestyle factors taken into account; no family history sought; not specific or in-depth enough; no history of previous symptoms
M Medication being taken?	

might be appropriate to allow for counter assistants to gain a general picture of the person's presenting complaint but should not be advocated as a tool to establish a diagnosis.

Other examples of mnemonics that have been suggested as being helpful for pharmacists in a differential diagnosis are ENCORE, ASMETHOD and SIT DOWN SIR. Although these are more comprehensive than WWHAM, they still are limited. None take into consideration all factors that might affect a differential diagnosis. All fail to establish a full history from the patient with respect to lifestyle and social factors or the relevance of a family history. They are designed to establish the nature and severity of the presenting complaint, which in many cases will be adequate but for intermittent conditions (e.g., irritable bowel syndrome, asthma, hay fever) or conditions where a positive family history is important (e.g., psoriasis, eczema), they might miss important information that is helpful in establishing the correct diagnosis.

ENCORE

Meaning of the letter	Attributes of the mnemonic
E Explore	Positive points
N No medication	'Observe' section suggests taking into account the appearance of the patient – does he or she look poorly?
C Care	
O Observe	Negative points
R Refer	Sections on 'No medication' and 'Refer' add little to the differential diagnosis process; no social or lifestyle factors taken into account; no family history sought
E Explain	

AS METHOD

Meaning of the letter	Attributes of the acronym
A Age, appearance	Positive points
S Self or someone else	Establishes the nature of problem and if patient has suffered from previous similar episodes
M Medication	
E Extra medicines	Negative points
T Time persisting	Exact symptoms and severity of social or lifestyle factors not taken into account; no family history sought
H History	
O Other symptoms	
D Danger symptoms	

SIT DOWN SIR

Meaning of the letter	Attributes of the acronym
S Site or location	Positive points
I Intensity or severity	Establishes the severity and
T Type or nature	nature of problem and if the
D Duration	patient has suffered from
O Onset	previous similar episodes
W With (other symptoms)	Negative points
N Annoyed or aggravated	Fails to consider general
S Spread or radiation	appearance of patient; no
I Incidence or frequency pattern	social or lifestyle factors
R Relieved by	taken into account; no family history sought

Clinical reasoning

Decision making processes associated with clinical practice are an essential skill and are central to the practise of professional autonomy. Clinical reasoning is the cornerstone on which a diagnosis is made and relies on the practitioner being both knowledgeable and a good decision-maker. Clinical reasoning is an evidence-based, dynamic process in which the health professional combines scientific knowledge, clinical experience and critical thinking, with existing and newly gathered information about the patient against a backdrop of clinical uncertainty. It is a thinking process that allows the pharmacist to make wise decisions specific to individual patient context.

Whether we are conscious of it or not, most people will, at some level, use clinical reasoning to arrive at a differential diagnosis. It fundamentally differs from using mnemonics in that it is built around clinical knowledge and skills that are applied to the individual patient. It involves recognition of cues and analysis of data.

Steps to consider in clinical reasoning

1. Use epidemiology to shape your thoughts.

What is the presenting complaint? Some conditions are much more common than others. Therefore, you can form an idea of what condition the patient is likely to be suffering from based on the laws of probability. For example, if a person presents with a cough, you should already know that the most common cause of cough is a viral infection. Other causes of cough are possible and need to be eliminated. Your line of questioning should therefore be shaped by thinking that this is the default

cause of the person's cough and ask questions based on this assumption (see step 4, below).

2. Take account of the person's age and sex

Epidemiological studies show that age and sex will influence the likelihood of certain conditions. For example, it is very unlikely that a child who presents with cough will have chronic bronchitis, but the probability of an elderly person having chronic bronchitis is much higher. Likewise, croup is a condition seen only in children. Sex can dramatically alter the probability of people suffering from certain conditions. For instance, migraines are three times more common in women than in men, yet cluster headache is four times more common in men than in women. Use this to your advantage. It will allow you to internally change your thought processes as to which conditions are most likely for that person.

3. General appearance of the patient

Does the person look well or poorly? This will shape your thinking about the severity of the problem. If a child is running around a pharmacy, they are likely to be healthier than a child who sits quietly on a chair, not talking.

Taking these three points into consideration, you should be able to form some initial thoughts about the person's health status and ideas of what may be wrong with them. At this point, questions should be asked.

4. Hypothetical-deductive reasoning

Based on this (limited) information, the pharmacist should arrive at a small number of hypotheses. The pharmacist should then set about testing these hypotheses by asking the patient a series of questions.

Ask the right question, at the right time, for the right reason

The answer to each question asked allows the pharmacist to narrow down the possible diagnosis by eliminating particular conditions or confirming his or her suspicions of a particular condition. In effect, the pharmacist asks questions with knowledge of the expected answer. For example, a confirmatory type of question asked of a patient suspected of having allergic conjunctivitis might be 'Do your eyes itch?' In this case, the pharmacist is expecting the patient to say 'yes' and thus helps support your differential diagnosis. If a patient states 'no', this is an unexpected answer that casts doubt on the differential diagnosis; therefore, further questions will be asked and other diagnostic hypotheses explored. This cycle of testing and retesting the hypotheses continues until you arrive at a differential diagnosis.

Good questioning following these principles means that you will end up with the right diagnosis about 80% of the time.

5. Pattern recognition

In addition, clinical experience (pattern recognition) also plays a part in the process. Certain conditions have very characteristic presentations and, with experience, it is relatively straightforward to diagnose the next case drawing on previous cases seen. Therefore, much of daily practice will consist of seeing new cases that strongly resemble previous encounters and comparing new cases to old.

Pattern recognition is therefore much more commonly used by experienced or expert diagnosticians compared with novices. This is generally because there is a gap between the expert-novice knowledge and clinical experience. Research has shown that experienced doctors tend to only use hypothetical-deductive strategies when presented with difficult cases.

6. Physical examination

The ability to perform simple examinations (e.g., eye, ear, mouth and skin examinations) increases the probability of arriving at the correct diagnosis. Where appropriate (provided that pharmacists are suitably trained), examinations should be conducted. Seeing a rash or viewing an eardrum will provide much better data on which to base a decision than purely a patient description. Throughout this text, where examinations are possible, instruction is given in how to perform these examinations. Student consult has some videos on how to perform these physical examinations.

7. Safety netting

Even if you are confident of your differential diagnosis, it is important to use a safety net. You are not going to get it right all the time; making an incorrect diagnosis is inevitable. It has been reported that more than 50% of patients do not receive a definitive diagnosis at the end of a consultation with a family doctor (Heneghan et al., 2009).

Many people will present to the pharmacist at an early stage in the evolution of their illness. This means that they may not present with classical textbook symptoms or have not yet developed any red flag – type symptoms when seen by the pharmacist. For example, a child may have a headache but no other symptoms yet later go on to develop a stiff neck and rash and be diagnosed with meningitis, or a person may have an acute cough that subsequently develops into pneumonia. Using a safety net attempts to manage these situations.

This should take one of two forms:

- Conditional referrals

This should be built into every consultation. It is more than a mere perfunctory 'If you don't get better come back to me or see the doctor'. It has to be tailored and specific to the individual and the symptoms. For example, if a person presents with a cough of 10 days' duration, after how many more days would you ask them to seek further medical help – 3 days? 5 days? 7 days? Longer?

In this case, knowledge of cough duration is important. If the differential diagnosis is a viral cough, then we know that this symptom typically lasts 10 to 14 days, but it is not unusual for the symptom to last 21 days. Longer than 21 days suggests that the cough is becoming chronic and requires further investigation. A conditional referral in this case would be anything between 5 and 10 days; in other words, the person has had the cough for between 2 and 3 weeks, which is starting to become longer than one would expect for a viral cough. Conversely, if the cough had been present for just 2 days, a conditional referral after a further 2 more weeks would be appropriate.

- Advise patients on warning symptoms

It is entirely reasonable to highlight to patients signs and symptoms that they may develop subsequent to your consultation. For example, a child suffering with diarrhoea is managed by the pharmacist, but the pharmacist highlights the signs of dehydration to the child's parents. This would be good practice because the consequence of dehydration is clinically more significant than the diarrhoea itself.

Summary

In practice, family doctors tend to use a mixture of hypothetico-deductive reasoning and pattern recognition augmented with physical examination and, where needed, laboratory tests. It can seem to some patients that the doctor asks very few questions, spends very little time with them, and closes the consultation even before they have 'warmed the seat'. In these cases, the doctor is probably exhibiting very good clinical reasoning. Research has shown that with greater experience, doctors tend to rely more on nonanalytical decision making (e.g., pattern recognition), whereas novice practitioners use analytical models (hypothetico-deductive reasoning) more frequently.

Most pharmacists will exhibit some degree of clinical reasoning but most likely at a subconscious level. The key to better performance is shifting this activity from the subconscious to conscious. Gaining clinical experience is fundamental to this process. Critical for pharmacists is the need to learn from uncertainty. When referrals are made, every attempt should be made to follow up with the doctor about the outcome of the referral or encourage the patient to return to the pharmacy to see how they got on. Knowing what another person (usually a more experienced diagnostician) believed what the diagnosis was allows you to build up experience and, when faced with similar presenting symptoms, have a better idea of the cause. Without this feedback, pharmacists reach a 'glass ceiling', where the outcome is always the same – referral – which might not be necessary.

Differential diagnosis – an example

A 35-year-old female patient, Mrs JT, asks to speak to the pharmacist about getting some painkillers for her headache. She appears smartly dressed and in no obvious great discomfort but appears a little distracted.

Step 1: Use epidemiology to shape your thoughts

In primary care, headache is a very common presenting symptom that can have many causes. Table 1.1 highlights the conditions associated with headache that can be seen by community pharmacists.

From this background information, you should already be thinking that the probability of Mrs JT's headaches are going to be caused by the four conditions that are commonly seen by community pharmacists – tension-type headache, migraine, sinusitis and eye strain. This is not to say that it could not be caused by the other conditions, but the likelihood that they are the cause is much lower.

Step 2: Take account of the person's age and sex

Does age or sex have any bearing on shaping your thoughts? The person is a woman, and we know that migraines are more common in women compared with men. So, although tension-type headache is the most common cause of headache, the chances of it being caused by migraine needs to be given more prominence in your thinking. Will age affect your thinking? In this case, probably not, because the common causes of headache do not really show any real variation with age.

At this point, you should still be considering all four conditions as likely, but migraine as a cause should now be thought of more seriously along with the most common cause of headache: tension.

Table 1.1

Conditions associated with headache that can be seen by community pharmacists

Incidence	Cause
Most likely	Tension-type headache
Likely	Migraine, sinusitis, eye strain
Unlikely	Cluster headache, medication overuse headache, temporal arteritis, trigeminal neuralgia, depression
Very unlikely	Glaucoma, meningitis, subarachnoid haemorrhage, raised intracranial pressure

Step 3: The general appearance of the patient

Nothing obvious from her physical demeanour is constructive regarding your thinking. Her 'distracted' state might be as a consequence of the pain from the headache and worth exploring.

Step 4: Hypothetico-deductive reasoning

Each question asked should have a purpose; again, it is about asking the *right question, at the right time and for the right reason*. In this case, we are initially considering the conditions of tension-type headache, migraine, sinusitis and eye strain (listed in that sequence in terms of likelihood). It is important that your clinical knowledge be sufficiently sound to know how these different conditions present so that similarities and differences are known, allowing questions to be constructed to eliminate one type of headache from another. This will allow you to think of *targeted questions* to ask. Table 1.2 highlights associated signs and symptoms of these four conditions.

We can see that the location and nature of pain for the four conditions vary, as do the severity of pain experienced (although pain is subjective and difficult to measure reliably).

A reasonable first question would be about the *location* of pain. If the patient says, 'It is bilateral and towards the back', this points towards the tension-type headache (other causes are frontal or unilateral).

Given this information, if we asked about the *nature* of pain next, and working on the hypothesis of tension-type headache, we would be expecting a response from the patient of an 'aching, nonthrobbing headache', which might worsen as the day goes on. If patients describe symptoms similar to our expectation, this further points to tension-type headache as being the correct diagnosis.

To further confirm your thinking, you could ask about the *severity* of pain. In tension-type headache, we are expecting a response that does not suggest debilitating pain. Again, if we found that the pain was bothersome but not severe, this would point to tension-type headache.

At this point, we might want to ask other questions that *rule out* other *likely causes*. We know that migraine is associated with a positive family history. We would expect the patient to say there was no family history if our working differential diagnosis is tension-type headache. Likewise, asking about previous episodes of the same type of headache would help rule out migraine due to its episodic and recurrent nature. Similarly, eye strain is closely associated with close visual work. If the person has not been doing this activity more than normal, it tends to rule out eye strain. Finally, sinusitis is a consequence of upper respiratory tract infection so, if the person has not had a recent history of colds, this will rule out sinusitis.

Table 1.2
Associated signs and symptoms

Type of headache	Duration	Timing and nature	Location	Severity (pain score, 0–10)	Precipitating factors	Who is affected?
Tension-type	Can last days	Symptoms worsen as day progresses; nonthrobbing pain	Bilateral; Most often at back of head	2–5	Stress due to changes in work or home environment	All age groups; both sexes equally affected
Migraine	Average attack lasts 24 hours	Associated with menstrual cycle and weekends; throbbing pain and nausea; dislike of bright lights and loud noises	Usually unilateral	4–7	Food (in 10% of sufferers); family history	Three times more common in women
Sinusitis	Days	Dull ache that begins as unilateral	Frontal	2–6	Valsalva movements	Adults
Eye strain	Days	Aching	Frontal	2–5	Close vision work	All ages

Therefore, we are expecting certain responses to these questions if the symptoms are a consequence of suffering from a tension-type headache. If the patient answers in a negative way, this would start to cast doubt on your differential diagnosis. If this happens, you need to revisit your hypothesis and test another one – that is, think that the symptoms are caused by something else, and recycle your thought processes to test a hypothesis of a different cause of headache.

Consultation and communication skills

The ability of the community pharmacist to diagnose the patient's presenting signs and symptoms is a significant challenge given that unlike most other healthcare professionals, community pharmacists do not normally have access to the patient's medical record and thus have no idea about the person's problem until a conversation is initiated.

For the most part, pharmacists will be totally dependent on their ability to question patients to arrive at a differential diagnosis. It is therefore vital that pharmacists possess excellent consultation and communication skills as a prerequisite to determining a differential diagnosis. This will be drawn from a combination of good questioning technique, listening actively to the patient and picking up on nonverbal cues.

Many models of medical consultation and communication have been developed. Probably the most familiar and

most widely used model is the *Calgary-Cambridge model* of consultation. This model is widely taught in pharmacy and medical education and provides an excellent platform in which to structure a consultation. The model is structured into the following:

1. Initiating the session
 - Establishing initial rapport
 - Identifying the reason(s) for the consultation
2. Gathering information
 - Exploration of problems
 - Understanding the patient's perspective
 - Providing structure to the consultation
3. Building the relationship
 - Developing rapport
 - Involving the patient
4. Explanation and planning
 - Providing the correct amount and type of information
 - Aiding accurate recall and understanding
 - Achieving a shared understanding: Incorporating the patient's perspective
 - Planning: Shared decision making
 - Closing the session

For more detailed information on this model, there are numerous Internet references available, and the authors of the model have written a book on communication skills (Silverman et al., 2013).

Conclusion

The way in which one goes about establishing what is wrong with the patient will vary from practitioner to practitioner. However, it is important that whatever method is adopted, it must be sufficiently robust to be of benefit to the patient. Using a clinical reasoning approach to differential diagnosis has been shown to be effective in differential diagnosis and is the method advocated throughout this book.

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