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CHAPTER 17

Treatment guidelines and formulary manuals

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SUMMARY

Treatment guidelines are disease oriented and reflect a consensus on the treatments of first choice for a range of medical conditions. A formulary manual is drug oriented and contains summary drug information on a selected number of medicines, sometimes combined with practical prescribing and dispensing information. They can both be developed for various levels of health care.

The process of developing these publications (the formulary process) is a continual effort, not limited to the one-time production of a set of treatment guidelines or a formulary manual. The process includes gaining acceptance of the concept, preparing a text on the basis of wide consultation and consensus building, implementing an introductory campaign and training activities, and undertaking regular reviews and updates.

Treatment guidelines can be made for one institution, such as a hospital; for one level of care, such as all health centers; or for a region or nation. Treatment guidelines are powerful tools to promote rational prescribing, provided they are based on extensive involvement of the end users. Their development is a good opportunity to

integrate technical advice from various disease programs into an overall training program. Treatment guidelines should be used as the basis for undergraduate medical and paramedical training, for in-service training, for supervision, and for medical audit. The range of medicines included should be limited to those on the national list of essential medicines.

A formulary manual, whether at a national or facility level, should be developed by a formulary subcommittee of the national drug committee or the facility's drug and therapeutics committee. Both committees should ensure the full participation of prominent specialists and health opinion leaders in the process. One or two editors should be commissioned to draft and edit the formulary manual.

To maintain the credibility of the information, a system for regular updates and for incorporation of accepted amendments into the next edition is essential for both formularies and treatment guidelines.

This chapter builds on concepts introduced in Chapter 16, which should be read first.

17.1 Need for local reference manuals

After standard treatment guidelines (STGs) for a country's common conditions and complaints have been agreed upon and adopted, the next step is the development of a national essential medicines list and a formulary manual.

The procedures for developing an essential medicines list, a set of treatment guidelines, and a formulary manual are all similar; together, they can be called the formulary process. Standard treatment guidelines are disease oriented, whereas formulary manuals are very much drug-oriented documents. These two documents are the cornerstone of rational medicine therapy. General information on the selection of medicines and the development and maintenance of a list of essential medicines is given in Chapter 16. In this chapter, the specific aspects of the formulary process are outlined in relation to developing treatment guidelines or a formulary manual.

Treatment guidelines

The terms *standard treatment guidelines*, *treatment protocols*, and *clinical guidelines* are all used to indicate systematically developed statements that help practitioners or prescribers make decisions about appropriate treatments for specific clinical conditions. Treatment guidelines exist for various levels of health care, ranging from general prescribing

guidelines for paramedical workers in rural areas to detailed protocols for tertiary health care centers in wealthy urban areas and teaching hospitals.

Standard guidelines benefit health officials, supply management staff, health care providers, and patients (Box 17-1). Together with a national list of essential medicines, treatment guidelines are powerful tools in promoting the rational use of medicines, and they are integral in strategies to reduce antimicrobial resistance. They offer an opportunity to ensure that the training of health workers is based both on a logical approach to treatment and on a consensus about the selection of essential medicines. Comprehensive treatment guidelines are a logical starting point for integrated training and an excellent basis for pharmaceutical supply in the public sector. Treatment guidelines should be used for in-service training, supervision, and medical audit. They can also assist in the standardization (and rationalization) of prescribing patterns in countries with large numbers of foreign-trained medical graduates. STGs, when properly developed and implemented, will improve the patient's clinical outcome at a lower total cost (Grimshaw et al. 2004).

Formulary manual

A formulary manual contains summary information on a selected number of medicines. It is drug centered, and the information is usually organized in therapeutic groups. In

Box 17-1**Potential benefits of standard treatment guidelines****For health officials**

- Permits identification of cost-effective treatments for common health problems
- Provides basis for assessing and comparing quality of care
- Identifies most effective therapy in terms of quality and combats antimicrobial resistance
- Provides information for practitioners to give to patients concerning the institution's standards of care
- Is a vehicle for integrating special programs (control of diarrheal disease, acute respiratory infection, tuberculosis, malaria, and so on) at the point of the primary health care provider

For supply management staff

- Identifies which medicines should be available for the most commonly treated problems
- Facilitates prepackaging of course-of-therapy quantities of commonly prescribed items

- Makes medicine demand more predictable, so forecasting is more reliable

For health care providers

- Provides expert consensus on most effective, economical treatment for a specific setting
- Gives providers the opportunity to concentrate on correct diagnosis
- Sets a quality-of-care standard
- Provides a basis for monitoring and supervision

For patients

- Encourages adherence to treatment through consistency among prescribers at all locations within the health care system
- Ensures most cost-effective treatments are provided
- Improves availability of medicines
- Improves treatment and outcomes

most developing countries, the national formulary list is limited to medicines on the national list of essential medicines. A *therapeutic formulary* includes detailed and comprehensive therapeutic information on each of the medicines listed and may also include guidelines on rational prescribing and dispensing; here, the distinction between a formulary and treatment guidelines becomes less clear, as is the case with the *British National Formulary* (BNF).

Although there are several available reference texts that include comprehensive drug information, they may not be appropriate for all settings. A national formulary manual concentrates on medications relevant to a particular country. For example, it would exclude information on medicines that are not available in the country or that are overly expensive. It would also put less emphasis on uncommon, irrelevant, or minor side effects. But it should include information that may be missing in other texts on nationally important medicines, such as those used for tropical conditions or for locally common diseases that may be rare in other countries. It would also include information on specific treatment considerations (for example, G6PD deficiency, sickle cell anemia, HIV infection). Recommended dosage schedules can be adapted to national requirements, special storage guidelines may be added, and specific national problems (such as overuse of injections or polypharmacy) can be addressed.

The World Health Organization (WHO) launched its first model formulary in 2002, with electronic versions

available on its website and on CD-ROM. The *WHO Model Formulary* presents independent information on the more than 300 medicines on the *WHO Model List of Essential Medicines* and is updated periodically, along with the essential medicines list. Each section of the formulary starts with a comparative overview of various therapeutic alternatives, while each medication entry has information on use, dosage, adverse effects, contraindications, and warnings. The formulary is intended to be a model for national governments and institutions to use as a basis for developing their own national formularies. It is particularly relevant for developing countries, where commercial and promotional materials are often the only available source of drug information to health workers, prescribers, and patients.

17.2 Treatment guidelines

In developing standard treatment guidelines, the starting point is a list of common diseases and complaints. Next, the standard treatment of choice is defined for each diagnosis or problem. In terms of selection of health problems to be addressed, formatting standard treatment guidelines can be approached in different ways—

- Individual—Standard treatments are established for only one problem or set of problems, such as only

diarrheal disease, only acute respiratory infection (ARI), or only malaria.

- Selective—Standard treatments are established for a small number of high-priority problems, perhaps six to twelve, for example, a “package” of treatments for diarrheal disease, ARI, antenatal care, immunization screening, malaria, and tuberculosis.
- Comprehensive—Standard treatments are established for 30, 50, 100, or an even greater number of common health problems. When published, such standard treatment guidelines become more like textbooks than basic references.

Technical advice from various vertical disease-oriented programs (malaria, diarrheal diseases, schistosomiasis, tuberculosis, sexually transmitted infections, HIV/AIDS, and many others) can be integrated into one set of national treatment guidelines; however, separate funding sources for vertical programs can result in the independent publication of disease-specific STGs, which may be appropriate for facilities that function primarily to treat one condition (for example, HIV/AIDS).

The number of treatment guidelines developed should be appropriate to the specific situation. But developing individual treatment guidelines one by one may result in a missed opportunity to use the process to integrate several special programs. At the other extreme, comprehensive standard treatment guidelines risk overwhelming health workers with new information, thus reducing the chance that *any* of the standard treatments—even those for common, high-priority problems—will be followed. There may be situations where it is appropriate to target different levels of the health system with manuals containing differing amounts of information.

Information on local disease patterns should also be considered. Seldom do primary care clinics have access to clinical laboratories. But results from surveys using available district, regional, or national laboratory facilities can be used to make scientifically based selections of preferred medicines for certain types of diarrhea, ARI, malaria, tuberculosis, and other infectious diseases. Dynamic standard treatment guidelines are periodically updated to reflect changes in treatment patterns.

Any treatment guideline should include only medicines on the national list of essential medicines. This limitation ensures that the supply system, based on the list of essential medicines, supports the treatment guidelines. Ideally, a formulary list should be developed after the appropriate treatment guidelines for common diseases have been identified or developed.

Unlike the drug information in a national formulary manual, which tends to be noncontroversial, treatment guidelines may generate considerable differences of opinion among prescribers. Reaching consensus is much more

difficult, and the developmental process takes much more time. To the extent possible, treatment selection should be evidence based and take into account the local economic situation. Wide consultation is a key condition for acceptance and impact.

The process of developing treatment guidelines is similar to that of developing an essential medicines list or formulary manual (see Country Study 17-1), and only those aspects specific to treatment guidelines are discussed here (see Table 17-1 for an overview of the process).

Establishment of a guideline development committee

For national treatment guidelines, the guideline development committee can be a subcommittee of the national drug and therapeutics committee and is likely to differ from the national formulary committee. The committee should include one or two leaders who have final responsibility for the guidelines and who can lead the group through the process; clinical specialists in the fields under study; other experts as needed, such as a nutritionist or a health economist; several end users (general practitioners, medical assistants, nurses); patient/caregiver advocates; and other stakeholders who should have input. Sometimes focus groups are used to provide patient and caregiver feedback. Not all medical specialties need to be represented on the committee, but they can be co-opted to prepare or review the relevant chapters. The group should also have technical and administrative support.

Before starting the work, and especially before inviting other experts to write chapters or sections, the guideline development committee must make several important decisions on target groups, choice of authors, and editing and reviewing of the manuscript.

Targeting different levels of care. The length and format of the publication depend on the target group and the level of detail. A key question is: should all information for all levels of health workers be presented in one publication, or should different publications be issued for different levels of care? One publication for all levels can serve as a complete reference for all recommended treatments. It also allows practitioners at the lower levels to read about treatments that are recommended at the higher levels, which may be an advantage in emergency cases and is, at the least, educational. In addition, the production process is easier, and the publishing costs are reduced.

In contrast, separate guidelines for different levels of health care can recommend treatments focused on medicines supplied to that level, so that no unavailable medicines are recommended. Several developing countries with large proportions of paramedical prescribers have produced separate national treatment guidelines for general practitioners and for paramedical prescribers (such as clinical officers, medical assistants, and nurses). The former are pocket-size

Country Study 17-1 Production and use of treatment guidelines

Australia. Started as a hospital-based initiative, the Antibiotic Guidelines were first issued in Victoria in the late 1970s. They were used as a teaching document for medical students and interns and, more important, as an audit standard against which prescribing patterns in the wards could be compared. More and more hospitals became involved, and subsequent editions of the guidelines booklet were increasingly used in other regions of the country. New editions were introduced with marketing campaigns that were professional and inventive, using posters, advertisements, drug use studies, and face-to-face education. These campaigns, together with the widening range of professionals involved in subsequent editions, greatly improved the acceptance of the guidelines.

As the administrative requirements of producing, promoting, and evaluating a comprehensive set of therapeutic guidelines increased, the series was turned over to a nonprofit organization, Therapeutic Guidelines Limited, which expanded the range of titles and converted them to electronic format. The guidelines now cover ten areas, including analgesic, antibiotic, cardiovascular, gastrointestinal, psychotropic, and respiratory medicines, and provide up-to-date therapeutic information for a range of diseases. The guidelines are developed by expert writing groups composed of about twelve people, including a chair, an editor, experts in relevant medical specialties, a general practitioner, and a pharmacist. Although the text is drafted by individual members of the writing groups, all group members devote many days to meetings and workshops to discuss and reach agreement on the final guidelines. At that point, the manuscript is reviewed by ten to twenty outside experts. The time taken to produce each book, from the first writing group meeting to publication, is twelve to fourteen months. Each booklet is updated every two to three years. Although the guidelines are used primarily in Australia, several other countries, including Japan and China, have adapted and translated individual guidelines for use locally.

Nicaragua. A series of therapeutic guidelines existed in Nicaragua; however, although they were technically sound, their presentation was unattractive and the language was more appropriate for doctors than for paramedical workers. In addition, the material was spread

over several booklets, and many health facilities did not have a complete set.

Development of new guidelines for rural health workers included a three-day workshop attended by health workers who were stationed alone in ten “sentinel” health posts as well as nurses, physicians, and pharmacists from the surrounding areas. The group identified the most common diseases treated in the health posts and drew up a corresponding list of essential medicines. The resulting draft booklet was widely field-tested. It was then decided to revise and expand the handbook for the national level with a bottom-up approach, again calling on the experience of end users. The national-level draft was also reviewed by a multidisciplinary group of specialists at the regional, provincial, and university levels. The product was an extensive, illustrated, 440-page learning and action guide for local health workers, *Buscando remedio* (“Seeking a Remedy”). The sixth edition was published in 2010.

Ghana. In 2004, Ghana’s National Drugs Program published the fifth edition of the Standard Treatment Guidelines (STGs) and Essential Medicines List (EML). The STG 2004 is an update of the 2000 version. The fifth edition is based on the best-available medical evidence and includes ratings of the quality of evidence associated with each recommendation. The new STG lists 530 drug products, a number that reflects eighty-three deletions and forty-eight additions since the 2000 edition. Changes to the list of medicines are partly the result of changes in the *WHO Model List of Essential Medicines* and the addition of antiretroviral medicines for HIV/AIDS. In addition, the British Approved Names used in the previous edition have been replaced with the recommended International Nonproprietary Names.

Ghana’s publication of the updated STG and EML 2004 coincided with the nationwide implementation of the National Health Insurance Scheme (NHIS). The STG and EML 2004 govern the standards of care under the NHIS, and the NHIS list of medicines for reimbursement is based on the national EML. The introduction of the new health insurance scheme gives Ghana the opportunity to make the STG 2004 widely available and facilitates adherence monitoring.

Table 17-1 Summary of the standard treatment guideline development process

Key action	Tasks
Recruit guideline development group chair	<ul style="list-style-type: none"> • Advertise • Interview • Train
Prepare scope	<ul style="list-style-type: none"> • Identify clinical issues • Search literature • Draft scope • Hold stakeholder workshop • Finalize scope with workshop input
Form the Guideline Development Group	<ul style="list-style-type: none"> • Select members <ul style="list-style-type: none"> – Health care professionals – Patients/caregivers – Technical experts – Technical/administrative support
Formulate the review questions	<ul style="list-style-type: none"> • Structure questions • Use patient experiences • Agree on review protocols and economic plan
Identify the evidence	<ul style="list-style-type: none"> • Develop search strategy for each question • Search relevant databases and information sources • Ensure validity • Consider stakeholder input
Review the evidence	<ul style="list-style-type: none"> • Select relevant studies • Assess quality of studies • Summarize evidence and present results
Create guideline recommendations	<ul style="list-style-type: none"> • Develop recommendations based on clinical and cost effectiveness • Prioritize recommendations for implementation • Formulate research recommendations
Agree on format and style and share writing guidelines with authors	
Write the first draft of the guideline	
Edit draft and send it to a wide circle of stakeholders for review	<ul style="list-style-type: none"> • Consult and respond to stakeholder comments
Revise draft based on comments	
Prepare final guideline	<ul style="list-style-type: none"> • Launch and publish the guideline
Review and update within a specified time frame	<ul style="list-style-type: none"> • Decide on update schedule • Correct errors

Source: Adapted from NICE 2009.

books with treatment guidelines in a condensed format; the latter use simpler language, are extensively illustrated, and recommend only medicines that are available at rural health facilities. One set of guidelines is usually sufficient in countries where primary health care is delivered mainly by physicians.

Identifying and assessing the clinical evidence. The first step in identifying the evidence is for the group to formulate the clinical questions to answer. The PICO guide (NICE 2009) provides a framework based on patients, intervention, comparison, and outcome—

Patients/population: Which patients or population of patients are we interested in? How can they be best described? Are there subgroups that need to be considered?

Intervention: Which intervention, treatment, or approach should be used?

Comparison: What is/are the main alternative/s to compare with the intervention?

Outcome: What is really important for the patient? Which outcomes should be considered: intermediate or short-term measures; mortality; morbidity and treatment complications; rates of relapse; late morbidity and readmission; return to work, physical and social functioning and other measures such as quality of life; general health status; costs?

A systematic review of the evidence involves identifying and evaluating information to answer the questions based on the best available evidence in the relevant area. This process should be transparent and involves four major steps: selecting relevant studies; assessing their quality; synthesizing the results; and grading the evidence. The evidence may include primary scientific papers, systematic reviews from the Cochrane Collaboration, reviews published in well-

known journals, and guidelines developed by other credible organizations.

Many resources exist on how to assess clinical information (see, for example, NICE 2009, Shekelle et al. 1999, and SIGN 2008). Chapter 34 includes more detail on evaluating pharmaceutical information.

Drafting the guidelines. The most practical approach is to invite a number of authors to draft first texts of separate chapters. The authors should be recruited from the level of prescribers for which the guidelines are intended. For example, inviting a university specialist to write treatment guidelines for dispensing nurses may not be practical; a nurse-tutor would be better equipped for that task, although the author can consult relevant specialists and have them review the draft text. Several production issues—for example, the specifications for text and presentation (see Section 17-4)—should be addressed early in the process. A key to the successful acceptance of treatment guidelines is involving well-respected opinion leaders in the development process.

Reviewing and editing the draft. The editors of the guidelines should unify the draft chapters into one consistent document before sending the draft text out for review by a large number of stakeholders. As mentioned, reaching consensus on a treatment of first choice is usually more difficult than agreeing on the factual drug information that is included in a national formulary manual. In addition, more opposition is bound to arise after the guidelines have been published. Several rounds of consultation, involving an increasing number of experts, professional associations, patient/caregiver advocates, and other stakeholders can do a great deal to resolve objections. If consensus cannot be reached, the guidelines should indicate it.

Adapting existing guidelines. Many health care organizations and some ministries of health do not have the resources necessary to develop treatment guidelines from scratch. In this case, existing guidelines can be adapted for local use. Policy makers should focus on the guidelines that are most important, based on local disease patterns. It may be difficult to identify appropriate guidelines to evaluate, as they may not be easily accessible; however, some organizations post their guidelines on the Internet (see References and Further Readings). Other resources may be leveraged through partnerships and collaboration with other stakeholders.

Once a guideline development group identifies existing guidelines that correspond with their treatment priorities, they must still use as rigorous an evaluation method as possible, given the resources available. The task of the group that adapts existing guidelines, then, is not to identify and analyze the available literature, but rather to ensure that the adaptation and its recommendations are locally relevant and likely to be adopted by health care providers. A guideline assessment tool can be used to evaluate its usability and

validity. The Joint United Nations Programme on HIV/AIDS includes such a tool in its publication on developing treatment guidelines (UNAIDS 1999).

Information in treatment guidelines

Treatment guidelines are disease oriented (in contrast to formularies, which are drug oriented). This focus means that the treatment of choice is presented for each common health problem, together with basic information needed by the prescriber. Any appropriate nondrug treatments should always be included. Alternative treatments may be listed, with an indication of when they should be used. Comparisons of the costs of various treatments may also be included in the analysis, with the “best” treatment dependent on circumstances (such as antimicrobial resistance) or selection criteria (Box 17-2).

Some STGs, for example, those of Ghana, also include a section on the level of evidence for the recommended treatment. The evidence is rated as supported by either (A) randomized controlled trials; (B) well-conducted clinical studies; or (C) expert committee recommendations.

Treatment guidelines necessarily repeat some information that is also presented in the national formulary manual. It is not necessary, however, to include all drug information—only that which is needed to make rational treatment decisions.

Diagnostic criteria. Diagnostic criteria are especially important when a disease may present in different stages of severity (for example, dehydration). They must indicate when treatment is needed and when it is not, such as in the treatment of fever or cough. Required investigations may be included.

Treatment of first choice. The section on the first-choice treatment (drug or nondrug) contains the most information for the prescriber. It should include the choice of medicine, its usual dosage schedule, and, when needed, adapted dosage schedules for children, for patients with concurrent liver or renal diseases, for pregnant patients, for the elderly, and for other high-risk groups.

Cost of treatment. Information on the cost of treatment is useful if alternatives are proposed. However, including such information means that the guidelines must be updated regularly. The information can also be presented as price ranges, such as “cheap,” “moderate,” and “expensive”; these types of categories are unlikely to change substantially.

Important contraindications and side effects. The section on contraindications and side effects should list both relative and absolute contraindications; groups at special risk (the elderly, and patients who are pregnant, breast-feeding, or have liver or renal disease) must be highlighted. Side effects should be broken down into reactions that are self-limiting and those that may require a change in therapy.

Box 17-2 Cost-effectiveness analysis for choosing standard treatments

Even when funds are limited, the cheapest treatment for a specific health problem may not be the best treatment. A cost-effectiveness analysis (CEA, see Chapter 10) may help to organize cost and effectiveness information to guide decisions about first- and second-line treatments. Including indirect costs beyond the price of the medicine in the analysis provides a clearer picture. Indirect costs might include program costs, such as health staff, program administration, laboratory reagents, hospitalization costs, and vehicle costs. A CEA may be particularly helpful when higher-cost treatments are also more effective, such as for certain antibacterial, antitubercular, or anti-malarial drugs for which drug resistance is high. A CEA can also be useful in establishing standard treatment guidelines for chronic diseases, such as hypertension, and for antibiotic prophylaxis for surgery.

Below is a real-life example of how two different kinds of thrombolytic agents for the treatment of myocardial infarction were compared from the point of view of effi-

cacy and cost-effectiveness in Australia. The usual treatment of myocardial infarction was compared with usual treatment plus the use of either streptokinase or tissue plasminogen activator.

Comparison was done in terms of (a) total treatment costs, (b) death rates, and (c) cost per life saved (or death averted). The treatment costs included all the direct and indirect costs.

A CEA may be carried out using only information on cure rates and medicine costs. However, a truer picture may emerge if broader measures of effectiveness are used (morbidity, including disability, as well as mortality) and if all costs are included. For example, in an area of moderate resistance, a more effective second-line antimalarial may not be more cost-effective when only medicine costs are considered, but it may prove more cost-effective when additional costs are considered, such as hospitalization of patients who fail to respond to first-line treatment.

Economic analysis of two thrombolytics in acute myocardial infarction in Australia

A review of the literature was conducted in Australia to determine the cost-effectiveness of different thrombolytics to treat myocardial infarction (MI). The evaluation included the cost of the treatments and the mortality rate following MI.

Cost of treatment and mortality rates

Usual care (UC) of MI: 3.5 million Australian dollars (AUD)/1,000 cases, 120 die
 UC of MI + streptokinase (SK): AUD 3.7 million/1,000 cases, 90 die
 UC of MI + tissue plasminogen activator (tPA): AUD 5.5 million/1,000 cases, 80 die

Comparison of the different treatments

Difference between SK and UC of MI:

Cost of treatment = AUD 3.7–3.5 million/1,000 cases = AUD 0.2million/1,000 cases = AUD 200 per case
 Number of deaths that will be prevented = 120–90 = 30 deaths/1,000 cases treated
 Cost-effectiveness of SK = AUD 0.2 million/30 lives = AUD 6,700 per life saved

Difference between tPA and usual care of MI

Cost of treatment = AUD 5.5–3.5 million/1,000 cases = AUD 2.0 million/1,000 cases = AUD 2,000 per case
 Number of deaths that will be prevented = 120–80 = 40 deaths/1,000 cases treated
 Cost-effectiveness of tPA = AUD 2.0 million/40 lives = AUD 50,000 per life saved

Difference between tPA and SK treatments for MI

Cost of treatment = AUD 2.0–0.2 million/1,000 cases = 1.8 million/1,000 cases = AUD 1,800 per case
 Number of deaths that will be prevented = 90–80 = 10 deaths/1,000 cases treated
 Increased cost-effectiveness of tPA over SK = AUD 1.8million/10 lives = AUD 180,000 per life saved

If one has a budget of only AUD 500,000, which medicine should one use?

For SK: number of cases that can be treated = 500,000/200 = 2,500 cases
 Number of lives that can be saved = (30/1000) × 2500 = 75 lives
 For tPA: number of cases that can be treated = 500,000/2000 = 250 cases
 Number of lives that can be saved = (40/1000) × 250 = 10 lives

Conclusion

This study concluded that although tPA had slightly better efficacy and saved marginally more lives, when cost was taken into account, more patients could be treated and more lives saved using SK. In other words, the extra cost-effectiveness of tPA over SK was so high (AUD 180,000 per life saved) that fewer people could be treated, and fewer lives saved, using tPA as compared to SK, with the limited budget available.

Important drug information, warnings, and precautions. This section highlights the information that the patient should be given by both the prescriber and the dispenser.

Referral criteria. These criteria describe when to refer the patient to a higher level of care. For example: If the patient's condition does not improve within four hours, refer the patient to a hospital.

Index. Although treatment guidelines are usually disease centered, many prescribers also use them to check on specific drugs or dosage schedules. For this reason, an index with both drug names and health problems makes the manual more useful.

Use of treatment guidelines

Treatment guidelines should be used for basic training of health workers, in-service training, supervision, reference, and medical audit. They are potentially valuable in promoting the rational use of medicines, because many prescribers recognize them as useful references. Because they are related to the list of essential medicines, they should also serve as the basis for the supply of essential medicines.

It was originally hoped that the availability of guidelines would change irrational prescribing patterns. However, it has become apparent that sending treatment guidelines to all prescribers is not enough to bring about an improvement in prescribing practices. To be effective, guidelines must be properly introduced to the prescribers, and their use should be monitored (see Country Study 17-2).

All relevant health workers should have their own copies of the guidelines, and training courses should be organized to introduce the guidelines and teach health workers how to use them. Treatment guidelines for paramedical prescribers are usually well received and are common in developing countries, as is also true of national treatment guidelines for general doctors. National guidelines for tertiary care are rare, but general care guidelines are often used in tertiary institutions. In South Africa, three separate STGs exist: one each for adult and pediatric patients in the hospital setting and a combined version for primary health care, which also includes the national essential medicines list. In developed countries, treatment protocols are usually drawn up for specific diseases (hypertension, diabetes, certain types of

Country Study 17-2 Improving compliance with standard treatment guidelines in Indonesia

Acute respiratory infection (ARI) is the leading cause of morbidity and mortality of children under five years old in Indonesia. Despite the widespread availability of standard treatment guidelines in health centers, evidence suggested that health professionals did not always comply with the STGs and that the use of nonstandard medicines for ARI, such as antibiotics, antihistamines, corticosteroids, and phenobarbital, was common. An intervention study was carried out in twenty-four health centers with the aim of reducing the use of nonstandard medicines for under-five ARI patients.

Twenty-four health centers from two districts were randomly assigned to receive the intervention (Group A) or act as controls (Group B). The intervention consisted of a two-hour small group discussion about ARI STGs, followed by two self-assessment discussions (after one month and two months) to discuss prescribing habits. Finally, both the intervention and control groups participated in a feedback seminar where the results of the study were presented. The level of compliance with the STGs was measured by analyzing thirty prescriptions a month from each health center that had ARI as a single diagnosis, and looking at the number and costs of prescriptions and how many prescriptions included antibiotics, antihistamines, or corticosteroids.

Outcome measures	Baseline/4 weeks postintervention	
	Group A (n = 12)	Group B (n = 12)
Medicines prescribed per encounter	4.0/3.1	3.8/4.0
Percentage antibiotics	63/22	67/67
Percentage antihistamines	79/23	75/64
Percentage corticosteroids	21/6	22/24
Average prescription costs (rupiahs)	1,123/750	1,296/1,151

As the results in the table show, in Indonesia, small-group interactive seminars followed by two self-assessment meetings were effective in improving health center staff compliance with STGs for ARI. In addition, after presentation of the study results to both groups, the control health centers experienced significant improvements on all outcome measures. So, even though these centers did not experience the entire intervention, a low level of feedback was instructive.

Source: Hidayati and Munawaroh 2004.

Box 17-3**Using monitoring systems to evaluate the appropriateness of standard treatment guidelines**

Integral to the success of instituting and promoting the use of standard treatment guidelines is establishing a monitoring and evaluation system to guide updates and revisions. Monitoring programs can focus specifically on the issue of treatment failure, and reports of high rates of clinical failure should prompt a thorough investigation and evaluation. For example, are there problems in the treatment guidelines themselves or in the implementation of the treatment guidelines? Are quality medications available and used properly by patients? Investigations should document clinical failure rates, physician compliance with STGs, patient compliance with prescriptions, drug quality, and antimicrobial resistance estimates. If the evaluation finds high rates of clinical failure despite compliance with STGs, a review of the official recommendations is essential.

In several countries, monitoring programs for formal treatment failure have been established for certain conditions, such as malaria and tuberculosis, and results have been used to modify existing treatment guidelines. Many malaria-endemic countries have changed their national malaria treatment policy after antimicrobial resistance monitoring indicated that chloroquine or sulfadoxine-pyrimethamine was no longer effective in the country. For most infectious diseases, however, formal monitoring systems are not usually in place. Yet, mechanisms should exist for health care providers to report their experiences in using national STGs, and in turn, national authorities should have a procedure in place for responding to concerns by conducting studies or investigations.

Source: APUA 2003.

cancer) or for single hospital departments (prescribing policies in the pediatrics department of a teaching hospital, for example).

Treatment guidelines have the strongest long-term impact if they are frequently updated, widely distributed, integrated into the basic curriculum of medical and paramedical teaching institutions, and used for audit—especially when the turnover and transfer of field staff is so frequent that the effect of in-service training is quickly diluted. The first edition of guidelines should be reviewed and updated after one year to rectify errors and ambiguities; after that, revisions should occur every two to three years, or as indicated by new evidence to support changes (see Box 17-3).

17.3 Formulary manuals

As noted in Chapter 16, the term *formulary* can be applied to a simple formulary list, the formulary manual (the subject of this discussion), or a fully developed formulary system. A formulary system develops from the essential medicines or formulary list and the formulary manual. It includes drug information and other resources to support good pharmaceutical management and the rational use of medicines. Formulary manuals provide on-the-spot information with a particular scope of use in mind—for example, national versus facility-specific—as well as a focus on a particular level of health care practice. As with treatment guidelines, the production of a formulary manual is one step in an ongoing process, and formulary manuals should periodically be reviewed and updated.

Information in a formulary manual

The information is usually presented in the form of drug information sheets or drug monographs. Such sheets can also be used as the basis for developing drug package inserts for locally manufactured drugs targeted at either prescribers or patients.

In most developing countries, the medicines included in the national formulary list are limited to those on the national list of essential medicines. However, a formulary manual may also include some information on commonly used medicines whose use is not recommended, stating exactly why these medicines are not recommended and discouraging their use.

Box 17-4 outlines information that may be included in a formulary manual. Acknowledgments should list all persons or agencies that contributed to the formulary; this background enhances its authority and credibility. The introduction should briefly describe the development process and the manual's intended use.

Basic information for each medication should be easy to read and complete but concise. The format and wording should be carefully chosen so that the information can be easily understood.

If cost information is included, the formulary manual must be updated regularly. Price information may be presented as treatment cost per day or as cost per course of treatment. This information may be presented in tables or bar charts. If the manual includes information that prescribers or dispensers should give to patients to ensure the correct use of the drug, this information should be specific.

Box 17-4 Information in a formulary manual

Introductory information

- Acknowledgments (individuals and agencies that contributed, explanation of how drug information is presented in manual)
- List of approved abbreviations
- Introduction (development of manual, intended uses)
- Formulary policies and procedures

Basic information for each drug

- Generic name, common synonyms, or brand names
- Dosage form(s) and strength(s)
- Main indications (diseases and conditions for which a drug is given)
- Pharmacology (may include pharmacokinetic data)
- Contraindications (reasons not to give the drug)
- Precautions (such as pregnancy, breast-feeding, certain health conditions)
- Side effects (major and minor, with estimated frequency)
- Dosage schedule (dosage form, frequency, duration, pediatric dosage, dosage adjustments for the elderly and for those with renal or liver disease)
- Instructions and warnings
- Drug, food, lab interactions (most common or severe)

Supplementary information on each drug

- Price
- Level-of-use code
- Regulatory category (prescription only, over-the-counter, controlled narcotic drugs)
- Storage guidelines
- Patient counseling information
- Labeling information

- National essential medicines list reference number
- Stores catalog number

Prescribing and dispensing guidelines

- Rational prescribing
- Principles of prescription writing
- Use of placebos
- Special requirements for inpatient prescriptions
- Guidelines on quantities to be supplied
- Special requirements for controlled drug prescriptions
- Prevention and reporting of adverse drug reactions
- Dispensing guidelines (correct dispensing practices, patient counseling)
- List of cautionary and advisory labels
- Table of drug interactions (highlighting most common and most severe)

General drug use advice (optional)

- Use of intravenous (IV) additives (general guidance, table with recommended quantities)
- Prescribing in special situations (pregnancy, breast-feeding, renal or liver disease, the elderly, children, terminal care)
- Poisoning (general information, antidotes for common poisons, telephone for poison center if one exists)
- Treatment of snakebites, insect stings

Other components

- Metric conversion scales and tables
- Adverse drug reaction reporting form
- Formulary revision form
- Indexes (by generic name, brand name, therapeutic category)
- Abbreviations

Cautionary and advisory labels may be mentioned as a letter code (for example, A: Do not use alcohol).

A section on prescribing and dispensing guidelines can help promote rational medicine use. For example, general points to consider before writing a prescription include the use of International Nonproprietary (generic) Names, the importance of nondrug treatment and simple advice, suggestions for dealing with patients' demands for injections and other expensive dosage forms, and the limited usefulness of combination drugs (see Box 35-3 on safe medication practices, in Chapter 35). Dispensing guidelines may include correct dispensing practices and types of information to be

given in counseling patients (see Chapters 30 and 33). A list of cautionary and advisory labels can be included. Each of these can be numbered and cross-referenced in the drug sheets.

A comprehensive index of all drug groups and drug names (including brand names in italics, where appropriate) should be provided at the end of the publication. A good index greatly enhances the usefulness of the formulary manual and the accessibility of its information.

The first edition of the formulary manual will generate many comments. It is worthwhile to invite and structure such comments by including a formulary revision form, containing a request for supporting references.

Developing a formulary manual

The production and maintenance of a formulary manual are major tasks requiring discussion and planning. A clear, systematic process for the development, printing, and distribution of the manual should be agreed upon, with sufficient time, personnel, and resources allocated.

Many aspects of the formulary process have already been described, in discussions of essential medicines lists (Chapter 16) and standard treatment guidelines (in this chapter). The process for developing a formulary manual or national formulary list is not very different, and only some specific aspects are discussed here. WHO has published a practical guide on how to develop a national formulary based on the *WHO Model Formulary* (WHO 2004).

Establish a national formulary committee. The formulary committee could be the national drug committee itself or a smaller subcommittee of it. Ideally, the formulary committee should include a clinical pharmacist or pharmacologist, a physician, and additional prominent medical specialists, as required, to prepare or review sections related to their areas of expertise for accuracy and completeness.

Secure agreement on the content, structure, and format of the formulary. The formulary committee should propose the content, structure, general arrangement of the information, and layout for approval by the national drug committee. The committee should use models such as the *WHO Model Formulary* to save time and effort. Specific issues to be addressed regarding the nature, content, and format of the formulary manual are summarized in the next section.

Appoint an editor. One person (or a maximum of two coeditors) should be appointed to draft the text of the formulary manual. The editor should have an understanding of the pharmaceutical, pharmacological, and clinical aspects of the information required and of the level of language appropriate for the target audience.

Review the draft. When the first draft has been produced, it should be presented to the formulary committee for review. The committee should call upon other experts to resolve issues in dispute or to assist in the review of sections on specialized drugs or topics. Future users of the manual, such as doctors, nurses, pharmacists, and other health care workers, can comment on local practices and customs that may affect how the formulary is accepted. The accepted amendments are then incorporated into the text. This second draft should be widely circulated among the members of the national drug committee and any other invited reviewers for further comment.

A special national meeting involving committee members and stakeholders, including future users of the formulary manual, should then be called to discuss any outstanding issues and gain final approval of the form and content of the document. It is important for the credibility and accept-

ability of the formulary manual that all relevant opinions be considered and that key health policy makers be included in the process, even when their expected contributions may be minimal. With this approach, all participants will consider the formulary as partly their own creation and thus will be more committed to ensuring its acceptance and widespread use. Finally, it is important to keep the process ethical. The formulary system must not tolerate influence or pressure from pharmaceutical manufacturers or suppliers concerning any product being considered for addition to or deletion from the formulary.

Revise and produce new editions. As therapeutic practices change and amendments are made to the national list of essential medicines, these must be reflected in the formulary manual, along with proposed revisions submitted by users. When a sufficient number of revisions has been received and accepted, the development process must be repeated to produce a new edition. Producing new editions regularly is important for maintaining the usefulness and credibility of the formulary.

Between editions, new information can be disseminated through circulars or drug bulletins. Prior to the production of a second edition, readers' opinions on the general usefulness, design, and layout of the manual may be sought through a survey.

Practical issues in formulary manual development

In developing a formulary manual, consideration needs to be given to such issues as sequencing, presentation of the information, which information to include, ease of use, inclusion of brand-name drugs (see Figure 17-1), and pricing choices.

Sequence of drug monographs. Structuring drug information by therapeutic class is often preferred to alphabetical order. This format places each medicine in its therapeutic context and helps minimize duplicate listing of medicines. The therapeutic classification of the national list of essential medicines (Chapter 16) should be used. If the manual is organized by therapeutic class, each new section (by therapeutic class) could begin with applicable STGs (for example, guidelines for antiretroviral therapy at the beginning of the listings for the antiretroviral therapeutic class).

Presentation of drug information. Information on drugs can be presented in text or tables. Tables are useful if the information is brief and aid comparisons among medicines. When information is relatively extensive, however, text is more appropriate.

Information on medicines not on the national list of essential medicines. Should information be included on medicines that are not recommended but are used in some settings or that complement medicines on the list? Alternatively, information on these medicines can be provided through a drug information circular or drug bulletin,

Figure 17-1 Sample page from *WHO Model Formulary, 2008*

2. Analgesics, antipyretics, NSAIDs, DMARDs
Codeine
<i>Tablet: 30 mg (phosphate)</i>
Drug subject to international control under the Single Convention on Narcotic Drugs (1961).
Uses: mild to moderate pain; diarrhea (section 17.5.3).
Contraindications: respiratory depression, obstructive airways disease, acute asthma attack; where risk of paralytic ileus.
Precautions: renal impairment (Appendix 4) and hepatic impairment (Appendix 5); dependence; pregnancy (Appendix 2) and breastfeeding (Appendix 3); overdose: section 4.2; interactions: Appendix 1.
Dose: Mild to moderate pain, by mouth, ADULT, 30–60 mg every 4 hours when necessary; maximum, 240 mg daily; CHILD, 1–12 years, 0.5–1 mg/kg every 4–6 hours when needed; maximum, 240 mg daily.
Adverse effects: constipation particularly troublesome in long-term use; dizziness, nausea, vomiting; difficulty with micturition; ureteric or biliary spasm; dry mouth, headaches, sweating, facial flushing; in therapeutic doses, codeine is much less liable than morphine to produce tolerance, dependence, euphoria, sedation, or other adverse effects.

NSAIDs = nonsteroidal anti-inflammatory medicines; DMARDs = disease-modifying antirheumatic drugs.

as well as through training of prescribers. Including private-sector medicines that are not on the national list of essential medicines makes the formulary manual more comprehensive and of interest to a wider audience. However, inclusion of these medicines means that many more monographs must be prepared, making the publication much larger and not easily produced in portable form. And including information that is not relevant to the public sector may induce an unwanted demand for items that are not on the national list of essential medicines.

Size of the publication. A formulary manual may be pocket size for day-to-day use or a larger, desktop reference for occasional use. If used daily, durability is a key consideration. Size is determined primarily by intended use. If the focus is on individual drugs, the formulary is probably most useful as a desktop reference. If the focus is more comparative and evaluative, with information on indications, dosages, and cost—including medicines of first choice—it should probably be pocket size. A loose-leaf edition is not recommended, because with this format, pages tend to disappear and updates are not always properly inserted.

Ease of use. Consideration should be given to promote fast and easy access to the information in the manual, for example by using color-coded pages for each section, edge indexes, and headers. A quick reference listing of commonly used topics can be included on the back cover.

Inclusion of brand-name drugs. Although the drug monographs should always appear under the generic name of the drug, listing common brand names may be useful. If these names are included, they should appear in italics, both in the main text and in the index, so that they are easily identifiable. This method enables prescribers who are

not yet familiar with generic names to locate the required monograph easily. Cross-references are helpful.

Provision of national formularies free of charge. The production of a formulary manual is time-consuming and costly, and recovering some of these costs may be necessary. It may be possible to provide the formulary free to public-sector health workers and students and to charge the full price to users in the private sector. Ideally, the formulary manual should be distributed without charge to everyone in the target audience.

Hospital formularies

In many countries, especially those with highly developed health systems, hospitals develop their own formulary manuals. The advantage is that the formulary can be tailored to fit the particular requirements of the hospital and to reflect departmental consensus on first-choice treatments from the national list of essential medicines. In many countries, national STGs are in place, which can be used as a starting point when developing a hospital formulary list or local STGs.

The process is similar to that previously discussed. A hospital formulary committee is given responsibility for producing and subsequently revising the formulary list and manual. Additional information presented in hospital formulary manuals may include details of recommended hospital procedures, hospital antibiotic policy, and guidelines for laboratory investigations and patient management. Hospital formularies usually reflect consensus on the treatment of first choice and thus are not always distinct from treatment guidelines.

17.4 Production and distribution issues

Production issues for treatment guidelines and formulary manuals are similar. In addition to the information in Section 17-3, the following practical advice is useful for producing local reference manuals. The Malawi Essential Drugs Programme documented its experience in a WHO document that includes useful tips and descriptions of how problems were solved (WHO/DAP 1994).

It is important to define a standard style for chapters, tables, and monographs before requesting outside experts to write sections of a publication (treatment guidelines or formulary manual). If standards are not set, large differences in approach, level of detail, and style (for example, for headings, abbreviations, and use of bullets) can be expected. Correcting those differences at a later stage is cumbersome, time-consuming, and expensive. It is a good idea to include one or two examples and a few sample pages along with instructions to the writers. When the manual is ready to be printed, the page proofs should be checked very carefully. A typographical error in a dosage, for example, could be fatal.

The manual can be designed using an in-house computer and word-processing program or contracted out to a graphic designer and printing company. In estimating the number of copies required, consider whether the target audience is likely to increase in the time between editions. The number of copies required is commonly underestimated. Because increasing the number of copies is usually relatively cheap, including an extra margin of at least 10 to 20 percent is recommended.

A clear, systematic, and realistic distribution plan should be drawn up before the manual is printed. Apart from government mail, distribution may be carried out through workshops, professional associations, or sales, or by adding the manuals to regular pharmaceutical supply deliveries. The use of advanced technology in developing countries will affect how health care providers access information such as STGs and formularies (see Chapter 50). More and more formularies and guidelines are being made available online, especially those related to HIV/AIDS (for example, in Brazil, India, Namibia, Nepal). In addition, personal digital assistants (PDAs) and smart phones, which are gaining popularity in developed and developing countries, are another platform for medicine information; the *British National Formulary* is available in PDA format, and the *WHO Model Formulary* will also be PDA-accessible. The U.S. Guideline Clearinghouse has a list of guidelines that are downloadable to a PDA (www.guideline.gov). Whatever distribution method is chosen, the introduction and distribution costs should be included in the budget. A procedure should be set up to monitor distribution and to handle requests for additional printed copies.

17.5 Implementing and maintaining treatment guidelines and formulary manuals

The most common failure in implementing treatment guidelines and national formularies is a lack of credibility and acceptance, caused by failure to involve a wide range of national experts and established training institutions in their production. The greater stakeholders' involvement in the development process, the more likely they are to accept, use, and defend the outcome. Therefore, it is important to involve health workers at various levels, including rural health care and training institutions, in both the development and the review process. A broad range of opinions on the proposed content and format of a first edition and subsequent revisions should be solicited.

After the treatment guidelines manual or formulary manual has been developed and distributed, work is still required to ensure its acceptance and widespread use. Which interventions are the most effective to maximize usage in the health care community will vary depending on the local environment; however, studies show that all interventions should include paper-based or computerized reminders (Grimshaw et al. 2004). The quality of the materials also contributes to their acceptance. A common mistake with treatment guidelines is the selection of medications that are too sophisticated, too expensive, or not generally available at the relevant level of health care. However, acceptance can be improved by ensuring that medicine availability matches the guidelines, by using the materials for teaching and examination at all levels of training, and by using the manual to set standards for drug utilization review. If possible, free copies should be made available to all health workers and all types of students (nursing, pharmacy, paramedical, and medical) and the material should be officially adopted in training institutions. Finally, treatment guidelines and formulary manuals need to be publicized, so health care professionals know they are available (see Country Study 17-3).

The following are important elements for a plan to implement standard treatments—

- Printed reference materials
- Official launch
- Initial training
- Reinforcement training
- Monitoring
- Supervision

Printed reference materials may include manuals, posters, and training materials. Depending on the number of treatments involved, printed references may be in the form of wall charts, pocket handbooks, or larger, “shelf-size” reference books.

Country Study 17-3 Availability and knowledge of HIV/AIDS-related treatment guidelines in Rwanda

The Rwandan government has developed standard treatment guidelines for a number of illnesses, including HIV/AIDS, tuberculosis, and malaria. However, health providers at different levels of care do not necessarily have copies of the guidelines on hand—and indeed may not even know they exist. A 2003 survey focused on the availability of various Rwandan HIV/AIDS guidelines, including those for antiretroviral therapy (ART), opportunistic infections (OIs), sexually transmitted infections (STIs), and voluntary counseling and testing (VCT). Of the forty-nine public and mission facilities surveyed, staff at less than one-third knew that these documents existed,

with awareness being highest at referral facilities and lowest at district pharmacies (see table below).

Despite the government's efforts to develop a variety of guidelines to help health care providers mitigate the effects of the HIV/AIDS epidemic, stronger efforts are needed to improve awareness, demand, and distribution of STGs throughout the health care sector. To support correct usage of the HIV/AIDS guidelines, the survey authors' recommendation was that all staff involved in HIV/AIDS patient management, including pharmacists and pharmacy staff, receive training.

Availability of HIV/AIDS-related documents in public and mission health facilities

Document	All facilities (n = 49)	Level of care			
		Referral hospital	District pharmacy	District hospital	Health center
Awareness of existence of documents	27%	67%	21%	29%	23%
Guidelines for ART, adult and child	10%	67%	0%	6%	15%
Guidelines for ART and monitoring	18%	100%	0%	12%	31%
Guidelines for prescription of ARV drugs	16%	67%	0%	24%	15%
Guidelines for clinical management of HIV/AIDS patients	11%	100%	0%	6%	15%
Guidelines for medical management of HIV/AIDS, including OI	24%	67%	7%	24%	38%
Standard operating procedure for OIs	27%	67%	7%	29%	38%
Guidelines for STIs	57%	67%	29%	65%	85%
Correct manual for corresponding level of care	8%	33%	7%	0%	15%
Guidelines for VCT	39%	67%	7%	59%	46%
Guidelines for home-based care of HIV/AIDS	4%	33%	0%	0%	8%

Source: Lijdsman et al. 2004.

After the materials are distributed, a careful introduction campaign is needed to promote their general acceptance and use. This campaign may include the official launch of the publication by an upper-level official, press reviews, introductory workshops in key educational institutions, articles in drug information circulars and drug bulletins, or a competition for the design of the cover or formulary logo. The cost of such a campaign should be included in the planning.

To maintain formularies and STGs, regularly scheduled meetings must be established and attended by expert committee members who are responsible for updates. The committee reviews and evaluates the latest evidence regarding treatment of diseases and conditions as well as therapeutic drug classes, and considers which medicines should be added to or deleted from the formulary list. A monitoring and evaluation system that tracks treatment failure can

also inform this updating process (see Box 17-2). Any new medicines offering an advantage over the current selections should be considered for addition, and medicines that are no longer used or for which there is insufficient evidence of efficacy, safety, or quality should be recommended for deletion. Although the task of regularly maintaining STGs and formularies is time-consuming, it is critical.

As with the list of essential medicines (Chapter 16), the credibility and acceptability of the treatment guidelines and formulary manual can be maintained only if a transparent process for reviewing and updating them is in place. Especially for treatment guidelines, a second edition will be needed soon after the first. Mistakes will undoubtedly have occurred that need correction, and comments and proposals for change are bound to be received from people who may not have taken the trouble to comment on the first draft. ■

ASSESSMENT GUIDE

Management structure

- Is there a national committee responsible for managing the formulary process?
- Are there drugs and therapeutics committees in major hospitals?

Outcome of the formulary process

- Is there a national therapeutic guide with standardized treatments? When was the last update?
- Is there a national formulary manual with basic drug information? When was the last update?
- Are the treatment guidelines and formulary manual consistent with the national list of essential medicines?
- Do the treatment guidelines cover common problems such as acute respiratory tract infections, diarrheal diseases, sexually transmitted infections, tuberculosis, leprosy, hypertension, diabetes, and epilepsy?

Use of treatment guidelines and formulary manual

- Is there a national drug policy statement to encourage the use of the treatment guidelines and formulary manual?
- Are the treatment guidelines and formulary manual used for basic and in-service training of health personnel?
- What percentage of public-sector health facilities has a copy of the treatment guidelines and/or formulary manual?
- What percentage of prescriptions in public-sector health facilities complies with the treatment guidelines?
- Is a process in place to ensure that treatment guidelines and formulary manuals are periodically evaluated and updated?

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★ = Key readings.

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