



# Pharmaco Logical

The Newsletter of the Rational Drug Use Directorate  
Ministry of Health, Sultanate of Oman

*Volume 2 Number 2, October 2006*

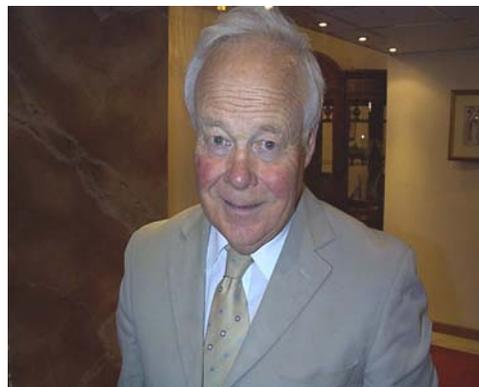
**A** warm welcome to everyone with this fourth edition of our bi-annual newsletter. In this issue the focus will be on reporting on news and the pharmaceutical research which is taking place in Oman today or is still ongoing.

## Recent Events

The Rational Drug Use Directorate is now located next to MoH headquarters behind the stores section on Al Wizarat Street, where the old computer department used to be. The move took place over a few days in May 2006. Everyone has settled in nicely after a short period of adjustment. Moving is

always an upheaval and means having to keep careful control of all of the inventory and paperwork required in our work in addition to all the archive material. Fortunately computers have made the task of document storage and retrieval so much easier. We now have much more space for storage and filing and a very pleasant environment for working in (*new contact details on the back page.....Ed*).

## National Workshop on Prescribing for Rational Drug Use (PRDU).



### Dr Stephen "Steve" Lonsdale

This intense 8 day training of trainers (TOT) course was held in the Ramada Hotel, Shatti Al Qurum, during May 2006.

The course was designed for and attended by new prescribers representing all of the 10 health regions in Oman.

A short term consultant, Dr Stephen Lonsdale, with the WHO essential medicines programme, ran the course.

### *In this Issue:*

#### Contributors

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**Some of the group of participants at the PRDU course**

Dr Steve was facilitated by personnel from the directorate of Rational Drug Use and by four Omani physicians, Dr Hassan Al-Lawaty, Dr Mussalam Al-Araimi, Dr Muna Al Zakwani, & Dr Thamra Al-Ghafri. Three of them had attended the first course in October 2002. The course was a mixture of lectures, group discussions, individual and group activities. Two days of the course were dedicated to thinking about local drug use problems and trying to come up with an intervention to study and resolve these problems.

It is hoped that the participants will ultimately hold local training workshops and initiate research programmes and interventions in their own regions.

**RDU Activities**

The DRDU has been active on several fronts.

A very successful one day workshop was held for Medical Interns in July. This workshop focussed on rational prescribing and was largely a “hands – on” practical session.

Recently two of the directorate staff gave presentations at a recent seminar on Adverse Drug Reactions at Sohar Hospital. Dr Brian Gunn gave his talk on pharmacogenetics and adverse reactions and Dr Ahmed Abdo-Rabbo’s talk was on “Drug

Safety Monitoring”. These seminars will be repeated in Nizwa and Salalah under an excellent new initiative to de-centralise continuing education programmes.

For the 6<sup>th</sup> year running Dr Brian Gunn was recently invited to give a lecture on ‘*The Principles of Rational Prescribing*’ as an introduction to the therapeutics course for clinical undergraduates at the College of Medicine, Sultan Qaboos University. Dr Ahmed Abdo-Rabbo has just completed writing and editing a “**Drug Manual for Nurses**” and it is ready for publication. This guidebook contains important information on the permissible drugs that specially trained nurses can prescribe during the absence of the doctor in primary health centres.

#### **Yahoo News Group on Rational Drug Use in Oman**

As an aid to rapidly exchanging information and news about rational drug use a special Yahoo group has been created (*Special thanks to Dr Hassan Al-Lawaty..... Ed.*). Anyone interested in RDU can join the group. Just surf along to Yahoo groups then to Yahoo Health groups then type in “**rduoman**” (without the quotes) into the search engine on the web page.

The URL is as follows:

<http://health.groups.yahoo.com/group/rduoman/>

It is early days so there are not many members and not much information to share at the moment. It is hoped that this will change rapidly as more people join and become familiar with and, most importantly, start to contribute to the group.

**The Director's Page**  
**Message from the Director**  
*Ph Batool Jaffer Suleiman*

*“Remember that sometimes the formulation of a drug and the excipients it contains can have an adverse effect rather than the drug itself.”*

A recent case in the online British Medical Journal <http://bmj.bmjournals.com/cgi/eletters/332/7550/1133#1133757>

highlights what can result from unawareness of the ingredients of a particular drug formulation.

A 58 year old woman had been diagnosed with polymyalgia rheumatica in 2000. Her blood pressure (BP) was slightly elevated (140/74 mm Hg) but other symptoms were unremarkable and she was stable on treatment. She was taking Prednisolone 5mg daily, up to six Panadol® (paracetamol) 500mg tablets per day and Calcichew D3 Forte® twice a day<sup>1</sup>.

At a follow up appointment in 2004 she complained of headaches, dizziness and lethargy. She was discovered to be hypertensive with average readings of 210/110 mm Hg. Over the next few days her BP varied between 158/79 and 210/110 mm Hg. Her lifestyle had not changed significantly but she happened to mention that in the previous 8 weeks she had switched herself from Panadol® to soluble Panadol® tablets.

Examination of soluble Panadol® formulation shows that it contains 427mg Na<sup>+</sup> (18.5mmol) per tablet. Her daily intake from 6 tablets was 2.562g and this was *in addition* to any dietary sodium. It is well established that salt intake is linked to blood pressure. The WHO and many national governments recommend limits for sodium intake e.g. UK recommended limit is 2g sodium (5g salt as sodium chloride) for women.

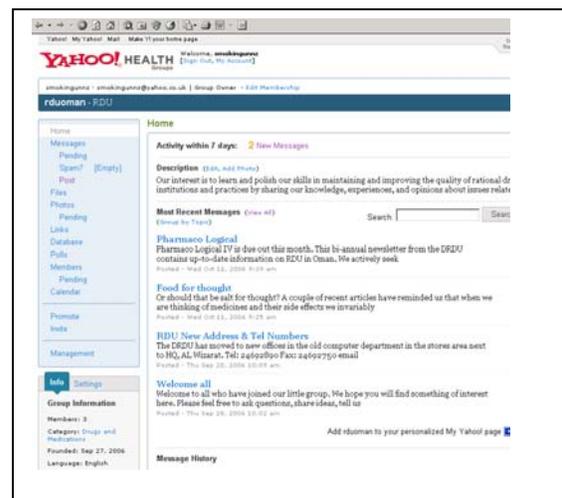
When the lady returned to using ordinary Panadol® her blood pressure returned to 145/85 mm Hg. The

increase in blood pressure was temporarily associated with the switch to a different drug formulation.

The data sheet for soluble Panadol® did indeed specify that "**the sodium content should be taken into account when prescribing for patients for whom sodium restriction is indicated**".<sup>2</sup> However, it should be a priority for prescribers and pharmacists to warn patients about using soluble forms of drugs especially those that are readily purchased over-the counter.

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**Sign up now and join the rduoman group on  
Yahoo!**



<sup>1</sup> Calcichew D3 Forte is 1.25g calcium carbonate and 10 micrograms colecalciferol

<sup>2</sup> Some research suggests that the accompanying anion (e.g. Cl<sup>-</sup>, HCO<sub>3</sub><sup>-</sup>, etc) may also be implicated in hypertensive side effects

## Oman National Formulary Questionnaire

### Results.

Dr Brian C Gunn

Section Head of Research

Directorate of Rational Drug Use

Many of you will have seen and possibly filled out a questionnaire which was designed to give feedback on this very important publication.

### Background & History

The WHO has recommended that every health system prepares and publishes their own national formulary as an essential part of a national drug policy. Oman is no exception and as part of the Oman National Drug Policy (ONDP), the ONF was published in June of 2003. The published work was the result of an extensive collaboration between a large number of specialists from different medical and surgical departments. The Directorate of Rational Drug Use was the major co-ordinator of the work and supplied the editor-in-chief (mainly Dr Abdul-Rasoul). All data were obtained from legitimate and trusted sources and everything written was checked over and over again by specialists and a team of sub-editors (Interested users will find a list of those involved in the introductory pages).

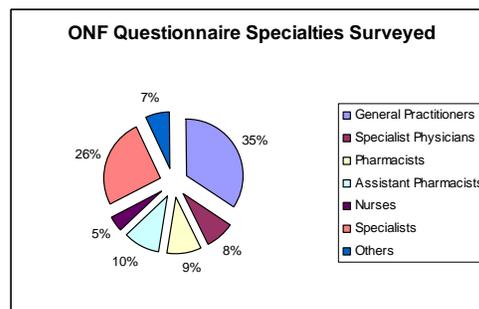
The ONF was designed as a stand alone reference guide to all of the drugs that are used in Government Health Facilities throughout the Sultanate. In addition, it contains advice on prescribing, dispensing and counselling. There are limited appendixes on drug interactions and a section on the common trade names. The unit prices of almost every drug used in Oman is included. This was hoped to give prescribers and dispensers an idea of the nominal costs involved in supplying drugs to patients.

*The ONF was not designed to be a general reference work on every drug that exists nor was it designed to replace existing reference works that are occasionally available e.g. the BNF, Martindale, etc.*

Updating of the ONF is inevitably less frequent than with similar international publications. This is due to the enormity of the task, the cost and because medicines are added and deleted from the Omani National Formulary less frequently.

The questionnaire was designed and distributed with the assistance of the Directors General and Superintendent Pharmacists in every health region. Overall it was hoped to get a wide spectrum of opinion from the end users. All levels of health worker were included in the survey and represented a wide range of specialities. A total of 446 completed questionnaires were returned to this directorate. Every region was represented proportionally as near as possible.

**Chart1: Specialities**



Unfortunately 51 (11%) of the returned questionnaires were from staff who claimed never to have seen a copy of the ONF. This is a possible indication of faulty distribution which will be followed up. Alternatively, some of these staff may

be new to their health facility and unaware of all available publications.

Some of the survey highlights now follow:

**Table 1: General Presentation & Style**

	Size	Style	Layout	Index	Appendixes
Good	58%	56%	56%	63%	53%
Fair	34%	37%	39%	28%	35%
Poor	6%	4%	1%	4%	4%
No Opinion	2%	2%	2%	4%	6%
No Response	1%	0%	2%	1%	2%

The size of the ONF was mentioned as a problem by several respondents. Currently, it is a little too big (A5) and heavy to fit easily into a coat pocket. This will be improved in the next edition. Style is a very personal thing and it is impossible to please everyone. Some respondents were *very strongly* anti the current style whereas others hardly mentioned it. The layout chosen (by body system) was adapted from the BNF and similar publications so it is difficult to know what people would prefer. It was noted that the index had a few omissions and a few pages had unfortunately moved during the final type setting. Also the appendixes came in for some criticism. The main request was that there needs to be more information especially on paediatric dosing, pregnancy, breast feeding and iv fluid additives.

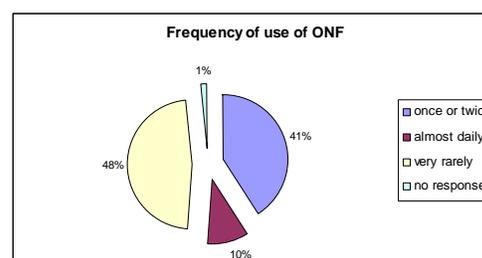
**Table 2: Usefulness**

	Useful	Trust	Prices
Yes	90%	88%	80%
No	4%	5%	9%
Don't Know	5%	6%	10%
No Response	1%	1%	1%

A high number thought the ONF was useful. A question that needed to be asked was if users actually trusted the data therein. There was a disappointing number who answered “no” or “don’t know” but without giving any specific examples. It is impossible to know the reasoning behind this response. It is interesting to contrast the attitude of different practitioners to these questions (*see below*). A high number of users thought that inclusion of the unit prices was a useful feature as had been hoped. However, about a tenth of users

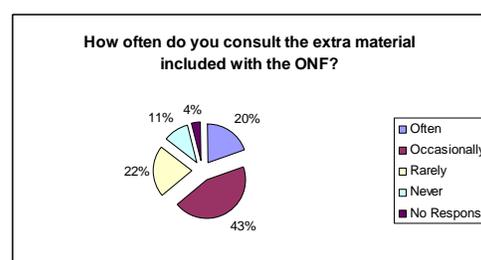
said that the prices were not useful and an equal number obviously do not use this feature. Prices were included to allow prescribers and others to understand the cost implications of the medicines they were prescribing or dispensing. By extrapolation it is relatively easy to calculate how much a course of treatment will cost per patient. Nowadays it is impossible to ignore cost as a factor in prescribing.

**Chart 2: Frequency of use**



Some interesting results came from an examination of the frequency of use. As expected most users consult the ONF very rarely or occasionally. This is based on necessity and is typical for a reference text. Some specialities will inevitably use it more than others. The majority stated that it was used based on need or that they were already very familiar with the limited array of drugs in their speciality.

**Chart 3: Use of Extra Material in ONF**



When asked about which sources they would use if they were checking a dose of a drug, most respondents answered that they would use a few different sources. A small number (15%) said they would use the ONF alone and about one-fifth said they prefer to use a source other than ONF.

The following tables display the results analysed for the different major specialities.

*The use of trade names was only included in the ONF as a last resort and as a small appendix. This is because the use of these names is inconsistent with rational and scientific drug use. There are many thousands of trade names found for the same drug in different countries. It was felt that there is too much potential for confusion between health providers and patients. The MoH actively discourages the use of trade names in prescribing and dispensing although the practice persists.*

consultation and production process of the ONF. Possibly they were also not aware of the philosophy of or background to the preparation of the ONF.

Some other specialities failed to appreciate the overall philosophy of the ONF and asked for greatly increased information, unreasonable frequency of updates, drugs to be listed mainly by trade names and other unrealistic features.

The ONF survey will be published in full elsewhere at a later date.

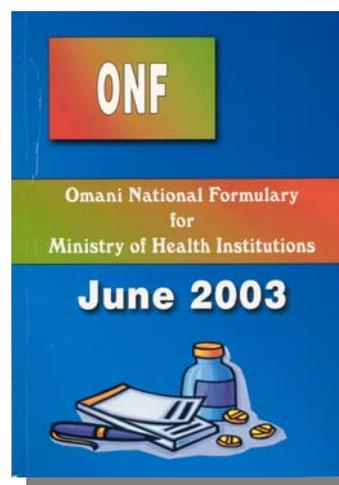
**Table 3: Usefulness analysed by speciality**

Useful	All GP	Pharma	AP
Yes	92%	69%	76%
No	2%	25%	10%
DK	4%	3%	12%
No Response	1%	3%	2%

A large number of the GPs surveyed find the ONF useful but a disappointingly large proportion of pharmacists (Pharma) and assistant pharmacists (AP) answered negatively.

**Table 4: Do you trust the data in ONF?**

Trust	All GP	Pharma	AP
Yes	90%	67%	80%
No	4%	17%	15%
DK	4%	14%	5%
No Response	2%	3%	0%



With respect to trusting the data and their sources once again the pharmacists were the harshest critics. The assistant pharmacists were similarly distrusting or uncertain.

Interestingly none of these groups provided specific examples or feedback. In fact, since publication, this author is aware of only one piece of written feedback about the ONF and that was a suggestion for inclusion rather than a negative criticism.



This is a curious response and it can only be speculated why this is the case. Perhaps the pharmacy personnel felt less involved in the

### An Audit of Written & Dispensed Prescriptions in a Hospital Setting

Contributed by:  
Department of Pharmacy and Drug Stores  
Khoula Hospital

Prescribing and dispensing errors occur in almost every health setting. As drugs become more sophisticated and therapies more and more complex the situation is likely to get worse. The outcome can be anything from fairly trivial or minor to serious harm or even death of a patient.

Only comparatively recently have individual health facilities started to take positive steps to reduce or eliminate errors by documenting each and every case of actual error or “near miss”.

In order to achieve the goal of error reduction or elimination there has to be a shift away from the normal “blame and shame” culture towards a more transparent and open system. Managers have to accept that errors occur because systems fail rather than due to negligence by an individual.

This current article reflects on experience in one hospital setting.

A medication error is defined as any error that occurs within the medication use process (prescribing, transcription, dispensing and administration) whether or not there is harm to the patient.

It has been estimated that medication errors globally<sup>3</sup>:

- Kill 198,815 people each year
- Put 8.8 million people in hospital
- Account for 28% of all hospital admissions
- Costs as much as \$182 billion (US)

At the present time there is no formal study of medication errors in Oman. It must be assumed that errors do occur and even if the percentage is small the high volume of dispensing means that the actual numbers might be significant.

In the present study it was decided to:

- use direct observations
- study OPD pharmacy morning shift
- choose July and September 2005
- review and double check all OPD prescriptions before dispensing to patient
- record all prescribing, dispensing and labelling errors

**Table 1 Number of errors**

Prescription problem	July	%	Sept	%	Total
Prescribing error	21	0.61%	4	0.15%	0.41%
Dispensing error	2	0.06%	8	0.30%	0.16%
Labelling error	3	0.09%	8	0.30%	0.18%
Total	26		20		0.75%

**Table 2 Types of error**

Medication Error									
Month	Prescribing Error			Dispensing Error				Labelling	
	Dose	Duration	Prescribing	Qty	Diff Drug	Dose	Strength	Freq	Instr
July	9	1	11	2	0	0	0	1	2
Sep	1	0	3	3	2	2	1	1	7

<sup>3</sup> American Medical News, Jan 15, p 11, 1996

**Results:**

The following tables show the major outcomes.

For the auditing period there were 6092 prescriptions and 46 significant errors were detected representing 0.76% of the total.

Errors were recorded on a specially designed evaluation form. Some examples of the more serious errors uncovered were:

- Nabumetone dispensed for indomethacin
- Rofenac® gel dispensed for calcium carbonate tablets
- Mefenamic acid adult dose prescribed for 7 year old child
- Tenoxicam prescribed for an asthmatic patient
- Nabumetone prescribed three times a day
- Two strengths of Diclofenac dispensed together (combined dose >150mg / 24 hours)

**Recommendations**

To reduce medication errors a number of recommendations have been suggested.

- Computerisation can help to reduce or prevent some errors
- Regular recording of all errors should be done
- DTC or a sub - committee should be established to review and discuss errors.

- Continuing education for all dispensers and prescribers

Study groups at PRDU course May 2006




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**The Art of Rational Prescribing**

*Contributed by  
Rajendra Shankar  
Assistant Pharmacist,  
Al Ismaiya Health Centre*

Sir William Osler, in 1891, captured the essence of man and medicines when he stated, "the desire to take medicines is perhaps the greatest feature that distinguishes man from animals". Use of medicines is prevalent in most societies and cultures; whether the use of a particular drug is for a medical, social, recreational or some other purpose; problems often

arise. It may even lead to irrational use of drugs. Our society is in great need of learning more rational and appropriate use of all types of drugs and gaining control over the products of our own technology. Encouraging rational prescribing practice among clinicians is a useful approach. A systematic approach to prescribing promotes rational drug therapy.

**Selecting a drug:** Depending on standard pharmacotherapeutic approach to common conditions, appropriate first choice of drugs is made. These are not patient specific, but apply to the diagnosis.

**Diagnosis:** Selecting drugs appropriately requires a knowledge of the pathophysiology of the disease. This helps prescribers understand the site of action of possible treatments to obtain maximum therapeutic effect.

**Therapeutic objective:** Defining the desired effect of treatment simplifies the process of selecting an appropriate drug, preventing unnecessary and ineffective prescribing.

**Effective groups of drugs:** To identify appropriate drug groups, range of drug information sources, including national formularies, treatment guidelines, textbooks & journals etc. are used.

**Choosing an effective group:** Classes of effective drugs can be compared on the basis of efficacy, safety, suitability, cost and easy availability.

**Choosing a drug:** Once an appropriate class of drug has been selected, a specific drug within the class must be chosen. Most drugs within the class will differ in pharmacokinetics. An active substance & dosage form, a standard dosage schedule & a standard duration of treatment must also be chosen.

**Applying Drugs to Patients** (process of rational treatment): Once a set of drugs is selected, these should be applied to specific patients.

**Patient's problem:** Making a correct diagnosis before appropriate therapy is initiated, prevents symptomatic treatment and focuses on the underlying cause.

**Therapeutic aim:** This step is specific to individual patients and takes patient expectations into account before starting the treatment.

**Suitability of the drug:** The efficacy and safety of a drug in an individual patient is checked on the basis of active substance, dosage form, standard dose and the standard duration of treatment.

**Prescribing:** A prescription is written to start the treatment. It should be clear legible and indicate precisely what is to be given.

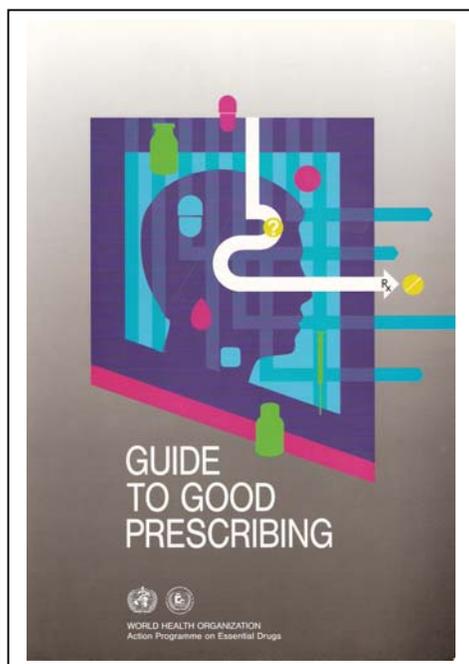
**Information:** Adequate & accurate information about the treatment and its potential side effects is given to the patient along with instructions & warnings regarding correct administration.

**Monitoring:** Anticipated & unexpected effects of the drugs are monitored and efficacy assessed. It is important to be aware of when & how drugs should be discontinued.

**Conclusion:** Individual prescribers will thus have a method for selecting an appropriate treatment and will be less susceptible to external influences. It is important that the theoretical knowledge gained is maintained in clinical practice to have maximum impact.

The WHO practical manual "Guide to Good Prescribing" produced in conjunction with the University of Groningen, the Netherlands, encourages this approach of self-directed learning skills & techniques, to make rational prescribing choices. This is the challenge for Pharmacotherapy in the future.

#### WHO "Guide to Good Prescribing"




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### Test Yourself

#### Quiz

The following is a list of true or false questions

which were answered incorrectly by a high proportion of new MOGPs in recent examinations.

(answers on back page.....Ed).

1. Systemic antibiotics are of little use in eye infections (T / F)
2. Gentamicin can be given as a single daily dose (T / F)
3. A maculopapular rash appearing after a patient is given amoxicillin indicates an allergy to penicillin (T / F)
4. Drowsiness, confusion or convulsions in patients on antidepressant therapy is usually related to hypokalaemia (T / F)
5. Aspirin increases the effect of warfarin by inhibition of metabolising enzymes (T / F)
6. Cimetidine interacts with many drugs which are bound to serum albumin (T / F)
7. Warfarin toxicity can be reversed with vitamin K (T / F)
8. To prevent recurrence of neural tube defects, folic acid should be taken in a dose of 400 micrograms daily (T / F)
9.  $\beta$  Blockers are contraindicated in pregnancy (T / F)
10. Calcium supplements confer additional benefit with HRT (T / F)
11. Paracetamol has a high safety margin (T / F)
12. Metolazone acts mainly in the distal convoluted tubule of the nephron (T / F)
13. The newer SSRIs are more effective antidepressants than the tricyclics (T / F)
14. Patients should be treated irrespective of cost (T / F)
15. Specialists personal opinions rank highly in evidence based prescribing (T / F)
16. Metronidazole is the best empirical treatment for diarrhoea of unknown origin (T / F)
17. Glucagon can be given by any route im, sc, or iv to treat hypoglycaemia (T / F)
18. Prednisolone should be avoided in breast feeding (T / F)
19. Menopausal women without a uterus require only oestrogen for HRT (T / F)
20. Diazepam suppositories can be used in febrile convulsions. (T / F)

The answers are given on the back page along with a BNF reference section where appropriate. Please refer for clarification.

**KEY ELEMENTS IN ASSURING RATIONAL USE OF MEDICINES**

- 1- Accurate diagnosis
- 2- Rational prescribing of most effective, safe and economic treatment based on patient's condition
- 3- Correct dispensing of the prescribed medicine(s)
- 4- Proper packing of medicine(s) to preserve them until use
- 5- Adequate and clear instructions for use
- 6- Compliance of the patient with treatment prescribed

**THE WAYS TOWARDS RATIONAL PRESCRIBING**

***DEAR PRESCRIBER PRESCRIBE:***

- 1- Only if necessary
- 2- Minimum number of medicines per consultation
- 3- Appropriate medicine
- 4- Fewer possible antibiotics
- 5- Least NSAIDs and antihistamines
- 6- Appropriate dosage form
- 7- Minimum necessary injectables
- 8- Adequate dose regimen (dose size and frequency)
- 9- Adequate duration of treatment
- 10- Lowest possible cost
- 11- Appropriate patient information

**INFORMATION CAPSULES**

**By: Dr. Ahmed Abdo-Rabbo  
Ph Manal Al-Ansari**

**STEPS TO ENSURE PROPER DISPENSING**

- 1- Sufficient dispensing time
- 2- Correct interpretation of the prescription
- 3- Correct drug, strength and dosage form
- 4- Good quality drug (not expired or deteriorated)
- 5- Accurate counting, measuring and compounding
- 6- Appropriate packing and labelling
- 7- Proper communication with patient and ensuring his/her understanding
- 8- Record keeping

**ASSURANCE OF PATIENT'S UNDERSTANDING & ADHERENCE**

- 1- Communicate effectively with the patient
- 2- Be sympathetic, interested & understanding
- 3- Take time & listen carefully to the patient
- 4- Prescribe as few drugs as possible
- 5- Use drugs with minimal side effects
- 6- Use small dose & long dose interval
- 7- Keep dosing regimens simple if possible (e.g. with meals)
- 8- Inform the patient about the name of medicine, how & when taken, side effects, precautions & interactions
- 9- Give verbal & written instructions
- 10- Establish a warm relationship & show the patient you really care

## Public Education in Appropriate Drug Use

*Dr. Ahmed Abdo-Rabbo*  
*Section Head Training and Public Education*  
*Directorate of Rational Drug Use*

While prescribers and dispensers play an essential role in the choice of medicines, the role of the consumer is equally important. Public knowledge, attitudes, and perceptions regarding the use of medicines influence the decision to seek health care, the choice of provider, the use of medicines and the success of treatment.

Therefore public information and education in appropriate use of medicines is essential and is considered by the WHO to be the key element in any National Drug Policy.

The needs for public education at a general level are to give people better understanding of the beliefs and potential danger of drug use and at a specific level to tackle particularly serious problems of misuse and to organize campaigns for specific drug use problem e.g. the wiser use of specific drugs.

There are several drug use problems in the community, including problems of overuse, under-use and inappropriate use of medicines. These problems may give rise to serious health and economic consequences for individuals and community.

Unfortunately, there are very few documented descriptions of drug use problems in the community. Also little efforts has been made to change irrational drug use in the community and to alter the behaviour of consumers.

The Directorate of Rational Drug Use effectively conducted a number of public education activities on appropriate drug use. The aims of these activities were as follows:

- Identify different drug use problems in the community.
- Provide individuals and communities with unbiased information.
- Improve knowledge, attitude and practices in order to use drugs in an appropriate, safe and judicious way.

The activities which have been conducted on promoting rational drug use in the community are as follows:

- Development of plans for promoting appropriate drug use by public.
- Collecting information already available about drug use problems in the community to provide guidelines for future activities.
- Conducting (still on going) a survey on patients' knowledge, attitude and practice towards drug use to provide data on common drug use problems in the

community and prioritize the problem(s) to be addressed in public education campaigns.

- Development of educational and training materials on rational drug use in the community for both public and health workers.
- Conducting one day seminar on certain aspects on rational drug use for health workers and health supporting groups from Wilayat Bausher.
- Training of health educators as trainers in promoting appropriate drug use in the community in North and South Sharqiya Regions and Muscat Governorate.
- Presenting lectures on promoting RUD in the community to female teachers, women and school children in Wilayat Bausher as well as school children in Wilayat Muttrah and staff in different ministries.

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### **Orientation Programme for New Pharmacists in Muscat Region**

This year has seen a number of excellent initiatives in the recruitment and training of pharmacists. All pharmacists recruited for work in Muscat Governorate must undertake an orientation programme for 6 weeks before starting their career proper.

This allows new recruits to become familiar with the health system, the pharmaceutical services and the many different jobs currently carried out by pharmacists in the region.

New recruits come to the Directorate of Rational Drug Use and a special programme has been set up for them. The programme consists of face-to-face or small group discussions and there are many practical tasks and challenges that have been designed for the training.

The aims of the training in this directorate is to help the trainee to know:

- The role of the DRDU
- How DRDU interrelates with the other pharmaceutical sectors (DGMS<sup>4</sup> & DGPA&DC<sup>5</sup>) and the Ministry of Health.
- Research Methodology
- Sampling & Statistics
- How to undertake indicator studies
- How to write reports and disseminate results

### **Recommendations**

- It is recommended that a structured programme is set up by each facility that the new pharmacist attends.
- If possible a senior member of staff should be assigned to work closely with the trainee

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<sup>4</sup> DGMS = Directorate General of Medical Supplies

<sup>5</sup> DGPA&DC = Directorate General of Pharmaceutical Affairs and Drug Control

- Close supervision of the trainee is very important but may be difficult in some facilities
- The trainee must not be used to “fill-in” for staff who are sick or on leave, etc.
- Face to face or small group discussions should be the teaching method of choice
- The trainee should receive as much hands on instruction as possible
- Some means of evaluating the trainee and their progress should be adopted. E.g. short quizzes and tests can be used.

### Cochrane Collaboration & Cochrane Library

The Cochrane library is recognised as the major archive for evidence based medicine. The Ministry of Health has recently taken steps to subscribe to this very important resource. Further details will be announced when they become available.



### Test Yourself Answers

1. True. Generally topical antibiotics are used in common eye infections. Only in the severest cases would injectable antibiotics be used. Sometimes by sub-conjunctival route.
2. True. Also true for other aminoglycosides. Serum monitoring is important. Better blood levels and reduced toxicity (BNF 5.1.4)
3. False. Rashes are common with ampicillin and amoxicillin (BNF 5.1.3)
4. False. Hypotension is the common side-effect in elderly patients (BNF 4.3)
5. False. By displacement from serum albumin plus its antihypertensive effect (BNF Appendix 1, analgesics)
6. False. Cimetidine inhibits metabolising enzymes (BNF 1.3.1)
7. True (BNF 2.8.2)
8. False. 5mg per day to prevent recurrence (BNF 9.1.2)
9. False. Conteral. *Cisplatin* is advised. There are risks in trimesters 1 & 2 but less risk in trimester 3. *Labetalol* is used in severe late-on hypertension.
10. False. Little if any benefit.
11. False. Max dose in 24hr is 4g. Liver toxicity can occur with higher doses. Most common drug used for self-harm.
12. True. Like all thiazides (BNF 2.2.1)
13. False. Side effect profile is better but not efficacy (BNF 4.3)
14. True. Medical ethics.
15. False. Specialists' *personal* opinions are not necessarily evidence based.
16. False. Overused in many situations.
17. True. (BNF 6.1.4)
18. False. (BNF 6.3.2)
19. True. (BNF 6.4.1.1)
20. False. Absorption is too slow (BNF 4.8.3)

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