

# Exercises in CLINICAL ACCURACY CHECKING

By A. EGGLETON, MSc, MRPharmS

*This is a follow-up to an article entitled "Setting a standard for clinical accuracy checking", published in our June issue*

In an earlier article, a means of assessing the competence of pharmacists carrying out clinical accuracy checking duties in dispensaries where technical staff undertake the management of the dispensing process was described.<sup>1</sup>

In this article, two prescriptions for assessment are given and each one is followed by a discussion. Readers are invited to identify the presenting problems. These prescriptions are actual charts that have

*Mrs Eggleton is senior pharmacist, training and education, at Addenbrooke's hospital, Cambridge*

passed through the dispensary at Addenbrooke's NHS Trust, although the patients' names have been changed to maintain confidentiality. The check list used by candidates is shown in Figure 1.

## PRESCRIPTION 1

Figures 2, 3 and 4 are all part of the chart for prescription 1. The model answers are found in Figure 5. The rationale for the answers has been outlined below. The patient has no known allergic reaction to any drug.

### CLINICAL ACCURACY CHECKING TEST

#### Task

1. You have - **minutes** to review the following prescription charts and identify the problems. You have - **minutes** to document your answers

**Total time allowed:- minutes**

2. You are only able to make ONE intervention per prescription **For each of the prescriptions**, using the answer sheets provided:

3. Document the ward and clinical speciality

4. List briefly the endorsements you would make to the chart

5. List briefly the patient's major medical problem(s) suggested by the drug therapy

6. List briefly the most important pharmaceutical problems you would try to resolve **if you were checking the chart at ward level** (maximum of **SIX** problems)

7. State the **ONE priority intervention** you would make for **EACH of the charts** given that you are **checking the chart in the dispensary**

8. Briefly state the **action** you would take to resolve the priority intervention

9. State the urgency of the **priority** intervention from one of the following:

Urgent = chart must be amended by a doctor or pharmacist before being dispensed

Less urgent = any other action, such as sending an intervention note to the doctor, highlighting the problem to the ward pharmacist, phoning a nurse or doctor for further information.

10. Materials allowed:

- |  |                                  |
|--|----------------------------------|
| BNF  | Martindale's Extra Pharmacopoeia |
| Paediatric formulary                                   | Hospital formulary               |
| Compendium of data sheets and SPCs                     | Calculator                       |
| Trissel's Handbook of Injectable Drugs                 | Hospital IV monographs           |
| List of wards — speciality and current ward pharmacist |                                  |

Answers (Candidate name:.....)

Prescription number 1

Review panel:

Ward Clinical speciality

Chart endorsements:

Medical problems:

- |    |    |
|----|----|
| 1. | 5. |
| 2. | 6. |
| 3. | 7. |
| 4. | 8. |

Pharmaceutical problems:

- |    |    |
|----|----|
| 1. | 4. |
| 2. | 5. |
| 3. | 6. |

Priority intervention number 1 2 3 4 5 6  
(circle the appropriate box)

Suggested action to resolve the priority intervention:

Urgency: Urgent Less urgent  
(circle the appropriate box)

*Figure 1: Instructions for candidates: In the test, the candidate is asked to state the ward and clinical speciality in order to focus attention on likely problems. For example, if the patient was on a medical ward specialising in renal disease, the pharmacist must be particularly vigilant about renally excreted drugs. The chart endorsements refer to the discharge or to take out (TTO) prescription where one exists or otherwise, to the inpatient chart. Candidates are given 6 minutes to review each prescription, and 3 minutes to document their answers for each prescription*

Surname Eagle	Hospital No 123456	Weight
First Names Alicia	Date of Birth 11.4.30	Sex F
Consultant PC	Ward Medical	Height

Regular Prescriptions					
Month and date _____					
Tick times or enter other times _____					
DRUG (APPROVED NAME) <b>Atenolol</b>				6	
				8	*
Dose	Route	Start Date	Stop Date	12	
50mg	PO	15.11.99		14	
Signature A Doctor			Pharm	18	
Additional Instructions				22	
DRUG (APPROVED NAME) <b>Diltiazem</b>				6	
				8	*
Dose	Route	Start Date	Stop Date	12	
60mg	PO	15.11.99		14	*
Signature A Doctor			Pharm	18	*
Additional Instructions				22	
DRUG (APPROVED NAME) <b>Burinex K</b>				6	
				8	*
Dose	Route	Start Date	Stop Date	12	
2	PO	15.11.99		14	
Signature A Doctor			Pharm	18	
Additional Instructions				22	
DRUG (APPROVED NAME) <b>MST</b>				6	
				8	*
Dose	Route	Start Date	Stop Date	12	
10mg	PO	15.11.99		14	
Signature A Doctor			Pharm	18	*
Additional Instructions				22	
DRUG (APPROVED NAME) <b>Asprin</b>				6	
				8	*
Dose	Route	Start Date	Stop Date	12	
75mg	PO	15.11.99		14	
Signature A Doctor			Pharm	18	
Additional Instructions				22	
DRUG (APPROVED NAME) <b>Salbutamol</b>				6	
				8	*
Dose	Route	Start Date	Stop Date	12	
2.5mg	PO	15.11.99		14	*
Signature A Doctor			Pharm	18	*
Additional Instructions				22	*
DRUG (APPROVED NAME) <b>Ipratropium Bromide</b>				6	
				8	*
Dose	Route	Start Date	Stop Date	12	
250mcgNeb		15.11.99		14	*
Signature A Doctor			Pharm	18	*
Additional Instructions				22	*

AS REQUIRED DRUGS					
DRUG (APPROVED NAME) <input type="checkbox"/> Paracetamol				Date	
Dose	Max Frequency	Route	Start Date	Time	
1G	4-6 hrly	PO	15.11		
Signature A Doctor			Stop Date	Pharm	Dose
Additional Instructions / Max. dose in 24 hours				Route	Given by
DRUG (APPROVED NAME) <input type="checkbox"/> Tamazepam				Date	
Dose	Max Frequency	Route	Start Date	Time	
10mg	nocte	PO	15.11		
Signature A Doctor			Stop Date	Pharm	Dose
Additional Instructions / Max. dose in 24 hours				Route	Given by
DRUG (APPROVED NAME) <input type="checkbox"/> GTN				Date	
Dose	Max Frequency	Route	Start Date	Time	
1 or 2		SL	15.11		
Signature A Doctor			Stop Date	Pharm	Dose
Additional Instructions / Max. dose in 24 hours				Route	Given by

Figure 3: Patient's "as required" drugs (prescription 1)

**Pharmaceutical problems** The practice at Addenbrooke's hospital is to check the discharge prescription (Figure 4) against the original inpatient chart for possible transcription errors.

In this case, the process revealed two errors as demonstrated (diltiazem, Burinex). The brand of diltiazem may be required if, after discussion with the doctor, the formulation and dose are changed to a slow release preparation. The original prescription would suggest the modified release tablet, since it is given three times a day, and in this case the brand need not be stated. Burinex may need to be changed to Burinex K, or, if the prescriber intended the change, the dose must be stated in milligrams since there are two strengths of bumetanide tablets (1mg and 5mg). These two points could be discussed over the telephone. The time of day at which a dose should be taken is marked on the chart so that this can be specified on the label.

Atenolol is contraindicated if the patient has moderate to severe asthma. The medicines information department contacted the manufacturer concerning the use of atenolol in chronic obstructive pulmonary disease (COPD). The view expressed was that beta-blockers may be tolerated in COPD. A recent meta-analysis<sup>2</sup> of the use of beta-blockers in patients post-myocardial infarction and suffering medical conditions often considered contraindications to beta-blockade, including mild asthma and COPD, suggested that mortality is reduced. However, if a beta-blocker is tried, initiation of therapy must be monitored closely. The National Service Framework for Coronary Heart Disease now recommends a beta-blocker for the management of heart failure.<sup>3</sup> Major trials have been conducted using carvedilol, bisoprolol and metoprolol-CR.<sup>4,5,6,7</sup> The beta-blocker should be initiated in a very low dose and titrated upwards over several weeks in patients stabilised on diuretics, ACE inhibitors and possibly digoxin. Atenolol, however, is only licensed to treat angina, hypertension or arrhythmias. There is no evidence on this chart that the patient has previously received the drug and the dose is quite high. This must therefore be the priority intervention to be discussed with the prescriber. The pharmacist should investigate the reason for atenolol and consider recommending alternative therapy if appropriate. Otherwise, the minimum outcome required would be to confirm that the patient has taken atenolol previously or to recommend that she remains under hospital supervision during initiation of therapy.

The prescription complies with the handwriting requirements for the Controlled Drug but it is not legally correct since it does not

Figure 2: Patient details and regular medication (prescription 1)

**Preliminary discharge notification**

**Patient addressograph:**

Alicia Eagle  
1 The Street  
Anytown  
DOB: 11.4.30  
123456

Admission date: 15.11.99  
Discharge date: 16.11.99  
Consultant: PC  
Specialty: Medicine

Your patient has been discharged from a medical ward today

Diagnosis:

Operation/Treatment:

Other relevant information given to patient:

Follow-up: \*Yes/No                      Outpatient appointment to be arranged for:

Prescription change to patient's own drugs:                      \*Yes/No

Drugs to be dispensed on discharge:

Date	Drug	Dose	Route	Times/day	Days	Additional	Pharm
16.11.99	Atenolol	50 mg	po	od	7		
16.11.99	Diltiazem	60 mg	po	od	7		
16.11.99	Burinex	2 tabs	po	od	7		
16.11.99	Morphine sulphate	10 mg	po	bd	7	14 Fourteen tablets	
16.11.99	Aspirin	75 mg	po	od	7		
16.11.99	Salbutamol	200 mcg	inh	qds	7		
16.11.99	Ipratropium bromide	40 mcg	inh	qds	7		

A discharge summary \*will/will not follow                      \*Delete as appropriate

Signature:                      A Doctor                      Designation: SHO                      Date:  
Name in block capitals:                      A DOCTOR                      Bleep number:

Figure 4: Discharge prescription or TTO (prescription 1)

**Answer sheet (answers are shown in magenta)**

Candidate name:.....

Prescription number                      1

Ward:                      **Medicine**                      Clinical speciality:                      **General medicine**

Chart endorsements:                      **Aspirin, Burinex K — in the morning**  
**Atenolol — in the morning (if continued, see below)**  
**Burinex — amend as discussed with doctor (see below)**  
**Diltiazem — amend as discussed with doctor (see below)**

Medical problems:

1. **Ischaemic heart disease or hypertension**
2. **Possibly early heart failure**
3. **Pain relief**
4. **Prophylaxis against cerebrovascular accident or myocardial infarction**
5. **Asthmatic or chronic obstructive pulmonary disease**

Pharmaceutical problems:

1. **Atenolol may be contraindicated and its use in this patient unlicensed**
2. **Transcription errors between chart and TTO. Clarify diltiazem dose and possibly the brand as well. Clarify Burinex K or dose in milligrams**
3. **Controlled drug prescription is illegal: it should state S/R tablets**
4. **Ischaemic heart disease: unusual therapy as there is no “when required” nitrate on the TTO**
5. **Risk of precipitating gout with a loop diuretic and low dose aspirin**
6. **Opiate analgesia: no laxatives prescribed. Opiates can cause respiratory depression**

Priority intervention number                      **Number 1 (but candidate must mention number 3)**

Suggested action to resolve the priority intervention:

**Contact doctor before patient's discharge to clarify**  
**Possible contraindication of atenolol**  
**Transcription errors on diltiazem and Burinex K**  
**Ask the doctor to come to pharmacy to amend the controlled drug prescription**

Urgency:                      **Urgent**

Figure 5: Solution to prescription 1

Prescription			
Surname Bradley	Hospital No 234567	Weight	
First Names Janice	Date of Birth 3.1.23	Sex F	Date
Consultant JD	Ward Orthopaedic	Height	

Regular Prescriptions						
Month and date				→		
Tick times or enter other times				↓		
DRUG (APPROVED NAME)				6		
Adalat				8	*	
Dose	Route	Start Date	Stop Date	12		
10mg	PO	6.4.99		14		
Signature			A Doctor	Pharm	18	
Additional Instructions				22		
DRUG (APPROVED NAME)				6		
Clexane				8	*	
Dose	Route	Start Date	Stop Date	12		
20mg	SC	7.4.99		14		
Signature			A Doctor	Pharm	18	
Additional Instructions				22		
DRUG (APPROVED NAME)				6		
Slow K				8	*	
Dose	Route	Start Date	Stop Date	12		
2 tabs	PO	6.4.99		14		
Signature			A Doctor	Pharm	18	
Additional Instructions				22		
DRUG (APPROVED NAME)				6		
Bendrofluazide				8	*	
Dose	Route	Start Date	Stop Date	12		
2.5mg	PO	6.4.99		14		
Signature			A Doctor	Pharm	18	
Additional Instructions				22		

the initials of the nurse who gave the medication

specify the slow release formulation. This factor places the intervention in the urgent category, since it would be illegal to dispense the prescription before it was amended. The remaining pharmaceutical problems could include several minor factors, such as monitoring for hypotension due to the additive hypotensive effect of the medicines, monitoring for respiratory depression or constipation with opiate

Once Only Prescriptions						
Pharm	Date	Drug (approved name)	Dose	Route/other directions	Time to be given	Signature
	7.4.00	Flucloxacilin	IG	IV	Induction	A Doctor
	7.4.00	Flucloxacilin	IG	IV	8 hours	A Doctor
	7.4.00	Flucloxacilin	IG	IV	16 hours	A Doctor
	7.4.00	Slow K	2 tabs	PO	1700hrs	A Doctor
	7.4.00	Bendrofluazide	2.5mg	PO	17.00hrs	A Doctor
	7.4.00	Potassium Chloride		IV	09.00hrs	A Doctor
	7.4.00	40mmol in 1L saline				
		Not as bolus				

Figure 7: Patient's "once only" drugs (prescription 2)

analgesia and the risk of precipitating gout due to a combination of bumetanide and aspirin.

**Medical problems** The medical problems in this patient will also require clarification. Salbutamol and ipratropium bromide are given via the nebulised or inhaled route for asthma or for COPD. The absence of an inhaled or oral steroid may be more suggestive of the latter.

Bumetanide (in Burinex K), a loop diuretic, would not routinely be prescribed for hypertension but is licensed to treat oedema. This may suggest that the patient has some degree of heart failure. Although atenolol and diltiazem can be used to treat hypertension, stable angina is the more likely medical problem suggested since glyceryl trinitrate (GTN) is prescribed on the inpatient chart, to be taken when required. If angina is the diagnosis, the pharmacist could clarify whether GTN should be added to the discharge prescription, or whether the patient has a supply at home.

**Summary** A competent candidate would be expected to notice the transcription errors, state that the Controlled Drug prescription was illegal and query the use of atenolol in a patient possibly suffering from asthma and/or heart failure. The interventions must be classified as urgent.

## PRESCRIPTION 2

This prescription (Figures 6 and 7) is for an orthopaedic patient, probably due for an operation on April 7, and highlights some of the issues surrounding prescriptions for surgical patients. The chart endorsements are not straightforward. The patient has no known allergic reaction to any drug. Figure 8 gives the model answers.

**Pharmaceutical problems** It is recommended that patients remain on the same brand of nifedipine if a slow release formulation is prescribed. The twice-daily dosage would imply the use of a slow-release preparation since the non slow-release formulation is usually taken three times a day. It is necessary to establish what the patient was taking prior to admission to clarify these points and then to endorse the chart accordingly.

The main pharmaceutical care issue to be addressed here is the inappropriate prescribing of an intravenous (IV) potassium supplement. The hospital policy states that a standard, ready-prepared infusion fluid should always be used unless the patient is in a critical care area with appropriate facilities for monitoring. The directions for infusion here are clearly inadequate since "not as a bolus" could be misinterpreted. Due to numerous reports in the pharmaceutical press regarding the dangers of IV potassium, the candidate is expected to suggest that the prescription be re-written on a fluid chart, stating the time course of the infusion.

The long term management of hypokalaemia is also an issue, particularly if drug-induced. The candidate should recognise that serum potassium needs checking before advice on management can be provided. The dose of oral potassium prescribed contains only 16 mmol

**Answer sheet (answers are shown in magenta)**

Candidate name:.....  
Prescription number 2  
Ward: Clinical speciality: Orthopaedic  
Chart endorsements: Adalat — nifedipine. State formulation (and probably brand as well). Swallow whole if slow release  
Clexane — enoxaparin  
Slow K — Potassium chloride S/R 600mg. Swallow whole with plenty of water  
Medical problems:  
1. Hypertension  
2. Deep vein thrombosis prophylaxis  
3. Hypokalaemia (possibly drug induced)  
4. Surgical operation (antibiotic prophylaxis)  
Pharmaceutical problems:  
1. Slow K: if hypokalaemic requiring IV potassium, this dose is inadequate. Check serum potassium and advise

2. Slow-K: may not be appropriate post-operatively  
3. IV potassium: rewrite correctly on fluid chart stating infusion time (40mmol over 4-6 hours)  
4. Consider alternative antihypertensives. Nifedipine causes reflex tachycardia, increasing risk of arrhythmias with low serum potassium  
5. Enoxaparin: why is it only being given post-operatively? Recommended at least two hours before surgery. Confirm 20mg dose  
6. Check antibiotic prophylaxis and suggest post-operative analgesia appropriate to type of surgery  
Priority intervention number Number 1 and/or number 3  
Candidates selecting problem 1 as the priority must have mentioned problem 3 and vice versa  
Suggested action to resolve the priority intervention:  
Contact doctor and ask that the administration of IV potassium be written correctly on a fluid chart, using ready-made infusion fluid. Total volume preferably one litre (1L). Check serum potassium and advise on further management of hypokalaemia  
Urgency: Urgent

Figure 8: Solution to prescription 2

of potassium and may be insufficient to treat the problem. The slow-release preparation is probably inappropriate in a patient about to undergo surgery since it should be taken with plenty of fluid, during a meal and while the patient is sitting upright or standing. Allied to this problem, it may be appropriate to recommend a change in anti-hypertensive therapy to exclude the thiazide diuretic if it is thought that hypokalaemia was drug-induced.

Recognition that this is a surgical patient should also prompt the candidate to question other relevant issues, such as why no post-operative analgesia is prescribed.

The timing of low molecular weight heparin (LMWH) is also important. The dose was omitted on April 6 and is not due again until

Advertisement

10 pm on April 7. The first dose will therefore be administered after the surgery, whereas the recommendation is that the first dose be given approximately two hours before surgery. The antibiotic prophylaxis should also be confirmed as appropriate to the type of surgery to be performed and according to local resistance patterns.

**Medical problems** Regarding medical problems, the candidate should recognise that flucloxacillin is prescribed as surgical prophylaxis (at induction of anaesthesia and eight and 16 hours post-operatively) and not for treatment of an infection. Nifedipine and bendrofluazide are probably for hypertension, although care is needed if investigation reveals that the standard (not slow-release) preparation of nifedipine was being used as this is not licensed for hypertension. An LMWH is routinely used for prophylaxis of deep vein thrombosis (DVT) at Addenbrooke's and this provides an opportunity to reinforce the current policy. Hypokalaemia could be induced by bendrofluazide and candidates are expected to have noticed both the oral and intravenous use of potassium supplements.

**Summary** A competent candidate would be expected to question the whole issue of hypokalaemia treatment in this patient, mentioning problems both with IV and oral administration. The intervention must be classified as urgent in view of the serious risk of inappropriate administration of IV potassium.

Did you find this article useful? Please write to *Hospital Pharmacist* if you would like to see a series of similar exercises.

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