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Information included is specific to the use of medicines in the **adult** setting.

1. Drug Interactions

A drug interaction occurs when the effects of a drug are altered by the presence of another drug, chemical or food. Drug interactions are very common and some can have very **serious, even fatal** adverse consequences.

Prescribers must be particularly vigilant when prescribing new drugs. This is especially true within the acute sector where the lack of an electronic prescribing system means interactions are not automatically flagged at the point of prescribing.

Prevalence studies suggest that between 15% and 45% of hospital inpatients are prescribed drugs that interact. Some interacting combinations may be appropriate with close monitoring; however others should be avoided altogether. Snapshot audits undertaken within NHSGGC have identified significant drug interactions with medicines that should not be co-prescribed.

The case examples below illustrate that there can be numerous drug interaction issues to consider when introducing new drugs at the point of admission.

Case Example 1:

Mrs HR has a history of recurrent DVT and essential tremor. She takes bisoprolol 5 mg daily and is stabilised on warfarin (INR checked every 4 weeks). She also takes simvastatin 40 mg at night.

She is admitted to hospital with suspected pneumonia (patient is penicillin allergic) which is treated with oral

clarithromycin. She also has associated fast AF which is managed with IV amiodarone.

Interaction	Management
Amiodarone and clarithromycin can both independently prolong the QTc interval. Combined therapy may have additive effects.	Avoid where possible. Consider monitoring of QTc if combination cannot be avoided.
Increased risk of bradycardia, AV block and myocardial depression when amiodarone given with beta-blockers .	Concurrent use is not recommended or should be undertaken with caution. If continued, monitor for bradycardia.
Increased risk of myopathy when amiodarone given with simvastatin .	Maximum dose of simvastatin is 20 mg daily if co-prescribed amiodarone.
Increased risk of myopathy when clarithromycin given with simvastatin .	Avoid combination. If clarithromycin is taken for a short course, withhold the simvastatin temporarily.
Amiodarone inhibits the metabolism of warfarin resulting in an enhanced anticoagulant effect.	Monitor INR closely. Warfarin may require dose reduction as per INR.
Clarithromycin inhibits the metabolism of warfarin resulting in an enhanced anticoagulant effect.	Monitor INR closely. Warfarin may require dose reduction as per INR.

The above example illustrates that some drug interactions can be managed with extra monitoring, however, others should be avoided. In this particular patient, it may be more appropriate to prescribe an alternative antibiotic e.g. doxycycline (refer to NHSGGC infection management guidelines for appropriate choice).

1. Drug Interactions (cont'd)

Case Example 2:

Mr AT has a history of epilepsy which is managed with sodium valproate M/R 600 mg twice a day. He presents with pyrexia and rigors. Gram negative bacilli is detected from blood cultures and treated with meropenem. The patient experienced increased seizure activity and reduced consciousness. Serum valproate blood concentration levels were checked and were found to be low.

Interaction	Management
Meropenem (and other carbapenems) can dramatically reduce the serum concentration of valproate. The exact mechanism for the interaction is unknown.	<ul style="list-style-type: none">○ Avoid where possible and seek an alternative antibiotic, discuss with microbiology or an infection specialist○ If a carbapenem is the only suitable therapy, seek neurology advice straight away. The interaction is not always successfully managed by an increased valproate dose and an alternative anticonvulsant may be appropriate.

The above example illustrates the importance of checking for drug interactions **before** prescribing a new drug and seeking a more appropriate alternative when necessary to prevent drug interaction related adverse effects.

Check for drug interactions at:

- **BNF Appendix 1**
- **Stockley's Drug Interactions**
Access via [The Knowledge Network](#) (Athens password required)
- **Individual Summary of Product Characteristics (SPC)** via <http://www.medicines.org.uk/emc>
- **Clinical Pharmacist or Medicines Information**

2. Management of haemorrhage, surgery or other invasive procedures in patients receiving the newer oral anticoagulants

The NHSGGC Thrombosis Committee has produced guidance for the management of haemorrhage, surgery or other invasive procedure in patients receiving either [dabigatran](#), [rivaroxaban](#) or [apixaban](#). These guidelines are available via the Intranet.

NOTE: All patients commenced on a newer oral anticoagulant agent will receive a PATIENT ALERT CARD at discharge, which provides patient information and advice if bleeding is experienced. The card should be carried with the patient at all times and shown to any other healthcare professional looking after them e.g. pharmacist or dentist.

3. Treatment of urinary tract infection – new advice

The NHSGGC Antimicrobial Utilisation Committee have endorsed a new recommendation from the Renal Physicians to avoid the use of trimethoprim **in hospitalised patients** with an eGFR of < 30 ml/min/1.73m².

This advice is in response to issues highlighted within the renal unit particularly in patients with stage 4 or 5 chronic kidney disease (CKD). There has been a number of CKD 4 or 5 patients referred to the unit who have developed hyperkalaemia and increased creatinine levels whilst receiving trimethoprim. The NHSGGC advice for hospitalised patients is as follows:

- Avoid trimethoprim if eGFR < 30 ml/min/1.73m²
- If eGFR < 30 ml/min/1.73m² prescribe
 - **co-amoxiclav** 625 mg oral 12 hourly (unless true penicillin / beta-lactam allergy)
- If eGFR < 30ml/min/1.73m² and true penicillin / beta-lactam allergy prescribe
 - **ciprofloxacin** 250 mg oral 12 hourly (remember: ciprofloxacin can cause QTc prolongation – check for interactions)
- **NOTE:** If eGFR < 10 ml/min/1.73m² seek renal advice regarding antibiotic choice and dose

This advice will be highlighted in the updated version of the Therapeutics Handbook (due out August 2013).

4. Learning from incidents: drug name mix ups

In April, the MHRA issued a [safety alert](#) on drug-name confusion and the need for vigilance to prevent **life-threatening errors**. Drug-name mix ups have also been reported within NHS GGC. Some case examples and the associated learning points are detailed below.

Case 1: Alfentanil/fentanyl confusion

Some examples of mix-ups include the following:

- selecting fentanyl from the CD cupboard when a continuous SC infusion of alfentanil was prescribed
- documenting that a 'patient is on a fentanyl infusion' but the drug prescribed is 'alfentanil'
- fentanyl 100 microgram SL tablet administered when an alfentanil 100 microgram SC bolus was prescribed

Good practice points

- Fentanyl and alfentanil are **different drugs** which are **NOT INTERCHANGEABLE**. As fentanyl is four times as potent as alfentanil, the clinical consequences of a drug-name mix up could be life-threatening.
- Be extra vigilant when prescribing or administering alfentanil or fentanyl as both are very strong opioids (e.g. fentanyl is approximately 100 times more potent than morphine).
- Use the correct spelling e.g. a prescription incorrectly spelled as 'fentanil' could easily be mistaken for alfentanil.

Case 2: Mercaptamine/mercaptopurine confusion

For 6 weeks, mercaptamine 100 mg daily was prescribed and administered instead of mercaptopurine 100 mg daily.

Good practice points

- Read the **whole** name. 'Rsreeach has swohn that as lnog as the fsrit and lsat lteter of a wrod is in the crorcet pcale tehn the wrod can be raed whoitt a pbelorm'.
- Consider whether the medicine fits the patient's medical conditions e.g. mercaptopurine is primarily used for inflammatory bowel disease and mercaptamine for nephropathic cystinosis.

Case 3: Hydroxychloroquine/hydroxycarbamide confusion

A patient was prescribed hydroxychloroquine 1 gram daily. This dose was not administered as it was higher than the normal dose and it did not fit with the patient's medical condition of polycythaemia. Both the completed Medicines Reconciliation (Meds Rec) form and the patient were consulted to confirm that the prescribed drug should have been hydroxycarbamide 1 gram daily.

Good practice points

- Consider whether the dose makes sense. The 'normal' dose of hydroxychloroquine is 200-400mg daily, therefore, a dose of 1 gram daily should be queried.
- 'Rule of 3' – the administration of more than 3 tablets should trigger further investigation. Five 200 mg tablets are required to administer a 1 gram dose of hydroxychloroquine.
- The Meds Rec form was helpful in this case. To avoid hand-writing the Meds Rec form and the risk of a transcription error, use *electronic* Meds Rec. For further info on eMeds Rec, [click here](#).

Please consider the potential for drug-name mix ups in your clinical area and the associated clinical consequences.

Remember!

- Write legibly on the Kardex
- For unfamiliar drugs, use the BNF to confirm the 'normal' dose, or contact pharmacy for advice.
- Consider whether the medicine fits with the patient's medical conditions.
- On admission, confirm the medicine with two sources e.g. the patient and the Emergency Care Summary (ECS).
- Where possible, use the patient and electronic sources to confirm a drug history in preference to a hand-written source.
- **Do not assume** that the prescription has been confirmed by another practitioner.
- Report drug name mix-ups on DATIX and where appropriate, report to MHRA.

5. Guideline news

Error in an 'End of Life Pathway' Symptom Control Algorithm

An error has been noted in the Acute NHSGGC 'End of Life Pathway' document previously known as the LCP. The error is located in the algorithm for 'Terminal Restlessness and Agitation' (page 25 of the End of Life Pathway Document).

When this symptom is absent it reads:

Give SC MIDAZOLAM e.g. 2 mg

It should read

Prescribe SC MIDAZOLAM e.g. 2 mg

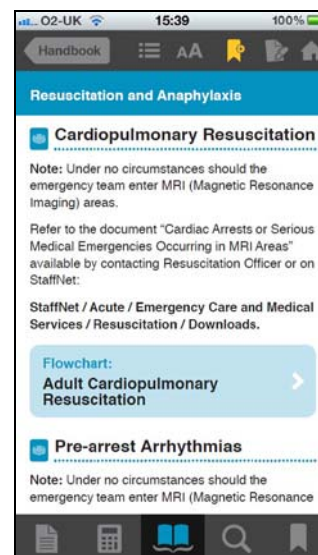
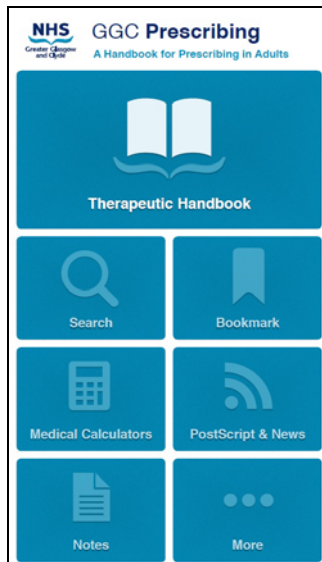
This error should be highlighted to all members of staff who could use the algorithm.

Guidelines approved since April 2013

NHSGGC Acute Care Guidelines
Management of haemorrhage, surgery or other invasive procedure in patients receiving dabigatran
Management of haemorrhage, surgery or other invasive procedure in patients receiving rivaroxaban
Management of haemorrhage, surgery or other invasive procedure in patients receiving apixaban
SIGN Clinical Guidelines
Management of schizophrenia (SIGN 131)
Long term follow up of survivors of childhood cancer (SIGN 132)
NICE Clinical Guidelines
Social anxiety disorder(CG159)

6. NHSGGC Prescribing App Coming soon.....

The new NHSGGC Prescribing App is under development. This will be available to download from iTunes and Google Play Store. The App will contain all the contents of the Therapeutic Handbook in addition to links to all PostScript bulletins. The screen shots below give an insight into the overall design of the App. Watch StaffNet for more information on launch date!



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