MedicinesUpdateAcute

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In this issue:

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

Launch of new GGC Medicines App

The GGC Medicines App is now available for Apple mobile devices and will be launched for Android devices by the end of August 2014. Once downloaded much of the content is available without an internet connection. Access is provided to the following resources:

1. Therapeutics Handbook

This GGC handbook is a well established aid for prescribers in the immediate management of >100 common medical conditions. The printed version is still available in all clinical areas (a summary of the major changes to this edition can be found here). Users may however find the additional functionality of the App version appealing.

Features of Therapeutic Handbook accessed via GGC Medicines App

- Portable
- Easy to navigate and search
- Guidelines, reformatted to work well on the small screen (Figure 1) with flowcharts as pdfs that open on request
- Users can bookmark their most referred to guidelines and annotate/email their own notes.

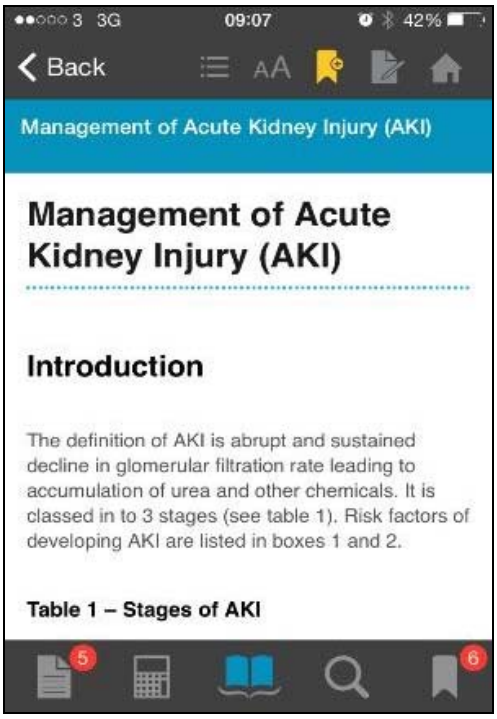
2.Gentamicin/Vancomycin Electronic Calculators

User friendly and fully validated dose calculators for these high risk medicines. (Also accessible via StaffNet).

3. Formulary (requires internet connection)

Access to full NHSGGC Formulary and regular updates.

Figure 1



4. Medicines Update Bulletins (requires internet)

Formerly known as Postscript this edition marks the re-launch of these bulletins as Medicines Update. The bulletins provide information on:

- Medicines safety messages
- Recent GGC incidents and associated learning
- New Guidelines (local & national)
- Major changes to Formulary/prescribing practices

This bulletin is GGC Medicines Update *Acute* however there is a range of Medicines Update bulletins available (click here for further information).

GGC Medicines website

Formerly known as the GGC prescribing website, www.ggcmedicines.org.uk provides access to the following:

- Searchable PDF of Therapeutics Handbook
- Formulary & Updates
- Medicines Update Bulletins
- Medicines Policies (e.g. Unlicensed Medicines Policy)

www.ggcmedicines.org.uk

Medication Allergy Documentation

Poor documentation of allergies and intolerances can result in the administration of inappropriate medicines to patients with the potential to cause significant harm. In addition, preferred therapies may be replaced with more toxic/costly/less effective alternatives if a reaction recorded as an 'allergy' is actually an 'intolerance' (e.g. nausea following penicillin administration).

A recent audit of 268 in-patient medicine charts at a GGC hospital looked at the frequency and quality of allergy/intolerance documentation. Key findings included;

- 20.5% of patients did not have the allergy section completed in their medical notes
- 17.9% of patients did not have the allergy section completed on their medicine chart
- 18.8% of patients with a blank allergy status on their medicine chart had a known allergy
- 14.6% of patients with a blank allergy chart were prescribed and given a penicillin, a medication group known to cause potentially serious allergic reactions
- Where allergies were recorded in the notes or on medicine charts, <20% had a descriptive nature of the allergy documented

Case studies Penicillin allergy

The following recent GGC incidents demonstrate the potential consequences of the above findings:

Case 1

Anaphylaxis occurred after administration of co-amoxiclav. Penicillin allergy was documented on the kardex. The senior medical staff, junior medical staff and nurse did not check the allergy section (or with the patient) before recommending, prescribing or administering the co-amoxiclav.

Case 2

Administration of amoxicillin resulted in another patient suffering anaphylaxis. The doctor and nurse had asked the patient about penicillin allergy but the patient had not mentioned it. On investigation, penicillin allergy was documented on the Emergency Care Summary allergy section.

In both these cases, treatment for anaphylaxis was required but the patient made a full recovery.

Other factors associated with reports of inadvertent administration of penicillin include lack of awareness of which antimicrobials contain penicillin. Generic prescribing (e.g. co-amoxiclav rather than Augmentin®, piperacillin/tazobactam instead of Tazocin®) can reduce this risk; see StaffNet for further information.

KEY MESSAGES

All healthcare professionals prescribing, administering and checking medication should be aware of the patient's allergy status. In particular they should;

- Establish an accurate allergy status (including the nature of any allergies/intolerances) as part of medicines reconciliation (check 2 sources; do not rely only on the patient to tell you).
- Record the patient's allergy status (including the nature of any allergies/intolerances) in the medical notes **and** on the medicine chart.
- Check the patient's allergy status before prescribing or administering any medicine to them. **DO NOT** take a blank allergy status as an indication that the patient has no known allergies. For nursing staff administering medicines, this is an essential part of the NHS GGC 'Chance to Check' process.

Prescribing in Kidney Disease

Acute Kidney Injury (AKI) and Prescribing

AKI is common in hospitalised patients with intercurrent illness, multiple co-morbidities and polypharmacy. It is defined as a sudden and sustained decline in Glomerular Filtration Rate (GFR) leading to an accumulation of urea and other chemicals, with or without, a drop in urine output. It is categorised in 3 stages from I (mild) to III (severe), as described in the table below.

Early recognition and prompt management of AKI is important, as even a small rise in creatinine during an acute admission has been associated with prolonged hospital stay, increased morbidity and an increased likelihood of death. For information on the management of AKI see the Therapeutics Handbook and for prescribing advice in AKI see the box below.

Table 1 – Stages of AKI

AKI stage	Definition
I	Cr >150 – 200% from baseline **or** Acute increase of Cr>25 micromol/L/48 hours **or** Urine output < 0.5 ml/kg/hour for > 6 hours
II	Cr > 200 – 300% from baseline **or** Urine output < 0.5 ml/kg/hour> 12 hours
III	Cr > 300% from baseline **or** Cr > 350 micromol/L **or** Urine output < 0.3 ml/kg/hour for 24 hours or anuric for 12 hours **or** Requires renal replacement therapy, irrespective of Cr

KEY MESSAGES FOR PRESCRIBING IN AKI

- Avoid nephrotoxic drugs where possible (e.g. gentamicin, vancomycin and some antifungals, antivirals, IV contrast media and cytotoxics)
- Stop medicines which can reduce renal perfusion (e.g. ACE Inhibitors, angiotensin II antagonists and NSAIDs) or exacerbate extracellular fluid volume depletion (e.g. diuretics).
- Do NOT place too much value on a single creatinine measurement. If the serum creatinine is rising rapidly and/or the patient is not passing urine then the GFR is likely to be zero.
- Formulae used to calculate estimated Glomerular Filtration Rate (eGFR) or Creatinine Clearance (CrCl) are only valid when the serum creatinine is stable. Use of such formulae for prescribing in AKI can lead to drug toxicity (and potentially exacerbate AKI).
- Consider re-introducing medicines once the AKI has resolved (it may be appropriate to leave this for some weeks until renal function has completely stabilised).
- Patients re-starting (or starting) ACE Inhibitors, angiotensin II antagonists and NSAIDs should be educated on the need to stop therapy during periods of illness associated with dehydration e.g. diarrhoea.
- Seek specialist advice if prescribing for a patient on dialysis.

Chronic Kidney Disease (CKD) and Prescribing

eGFR is a useful tool to detect chronic kidney disease (CKD) but it can also be used to guide drug dosing in *some* patients with CKD (see key messages box below).

Although renal function is increasingly reported as eGFR, published information on the effects of renal impairment on drug elimination is usually stated in terms of CrCl and this can lead to confusion. The key messages below provide guidance on how to prescribe for patients with CKD.

KEY MESSAGES FOR PRESCRIBING IN CKD

- Avoid nephrotoxic drugs where possible (e.g. gentamicin, vancomycin and some antifungals, antivirals, IV contrast media and cytotoxics)
- In elderly patients the creatinine can look 'normal' but due to reduced muscle mass, assume at least mild renal impairment.
- In practice, eGFR can be considered interchangeable with CrCl if the patient is of normal build and height i.e. the reported eGFR can be used to guide dosing even if the published information refers to CrCl. The exceptions are:
  - Patients at both extremes of body weight
  - Patients prescribed potentially toxic drugs with a small safety margin. (The BNF and/or local guidelines should be consulted for individual drugs. Examples include gentamicin, vancomycin and digoxin).

In these patient groups, **CrCl** should be used to adjust drug doses; the 'Cockcroft Gault' equation below can be used to estimate CrCl.

$$\text{CrCl (ml/minute)} = \frac{[140 - \text{age (years)}] \times \text{weight (kg)}}{\text{serum creatinine (micromol/L)}} \times 1.23 \text{ (male) OR } \times 1.04 \text{ (female)}$$

- Seek specialist advice if prescribing for a patient on dialysis.

REMEMBER

Prescribing in CKD:
Use CrCl in preference to eGFR for
1. drugs with a small safety margin
2. patients at extremes of body weight

Prescribing in AKI:
Use eGFR or CrCl ***with extreme caution*** and seek advice from pharmacy if necessary.

Aztreonam and Temocillin

The (non cystic fibrosis) use of carbapenems (e.g. meropenem) in NHSGGC has more than doubled since early 2010. The potential consequence of this is increased emergence of multi-drug resistant gram negative bacteria (MDRGNB) and in particular, resistance to piperacillin/tazobactam (Tazocin®) and carbapenems (antibiotics usually of last resort). Cases of carbapenem resistant *Klebsiella* and *Escherichia coli* have been reported throughout the UK.

The Antimicrobial Management Team is strategically introducing 2 antibiotics (aztreonam and temocillin) into guidance, as alternative options to carbapenems and piperacillin/tazobactam, to reduce emergence of MDRGNB.

Increased use of these antibiotics will have financial implications as both are more expensive than piperacillin/tazobactam and carbapenems. However in the long term this will be less than the cost of treating carbapenem resistant bacteria.

AZTREONAM KEY MESSAGES

- It is a monobactam (monocyclic beta-lactam) antibiotic with activity against gram negative bacteria only.
- Licensed indications include bacteraemia, urosepsis, pneumonia, and intra-abdominal sepsis.
- Within NHSGGC aztreonam is now indicated for various infections. Click here for further information.
- The usual adult dose of aztreonam is 2 grams. The frequency will vary depending on the severity of the infection being treated and the patient's renal function.
- It should be avoided in patients who have experienced anaphylaxis or angioedema to beta-lactam antibiotics, however, it may be considered with caution if any previous reaction has been limited to urticaria only.

TEMOCILLIN KEY MESSAGES

- It is a penicillin antibiotic with activity against Gram negative bacteria only (except *Pseudomonas* and *Acinetobacter*).
- It is stable against a wide range of beta-lactamases.
- It is licensed for septicaemia, urosepsis and pneumonia.
- Within NHSGGC it is reserved for treatment of extended spectrum beta-lactamase infections in preference to meropenem.
- The usual adult dose is 1-2 grams every 12 hours; adjust the dose according to renal function.
- **It is restricted to use on the advice of an infection specialist only (an Alert Antibiotic form must be completed and sent to pharmacy).**

Remember

MDRGNB are increasing worldwide and prudent prescribing of carbapenems and piperacillin/tazobactam is essential in combating this threat.

Aztreonam and temocillin are alternative options to carbapenems and piperacillin/tazobactam to reduce the emergence of MDRGNB.

New Vancomycin Prescription Chart

A new vancomycin prescribing, administration & monitoring chart for **adult** patients receiving intermittent (pulsed) infusion is being rolled-out across GGC. See GGC Medicines website for further information.