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An Audit of Management of Acute Uncomplicated Lower UTI At a Health Centre in Central Scotland

Kirsten E Stewart (5th year MBChB)
Correspondence to: Kirsten E Stewart : K.E.Stewart@dundee.ac.uk

ABSTRACT

Clinical audits are an important method of assessing quality improvement within the NHS and aims to improve patient care by reviewing certain outcomes against agreed proposed standards. These can then be used in the implementation of change in the management of the assessed topic. This audit aims to assess the management of Urinary Tract Infection (UTI) in Primary Care and will focus on women aged between 16-65 years old in a Health Centre in Central Scotland over a 2-month period.

Key Words: Urinary Tract Infection; General Practice; Clinical Audit

Audit Background

Clinical audits are an important method of assessing quality improvement within the NHS and aims to improve patient care by reviewing certain outcomes against agreed proposed standards. These can then be used in the implementation of change in the management of the assessed topic. This audit aims to assess the management of Urinary Tract Infection (UTI) in Primary Care and will focus on women aged between 16-65 years old in a Health Centre in Central Scotland over a 2-month period. The outcomes being assessed will be discussed further under the next two headings – 'Identifying the Clinical Problem' and 'Criterion and Standards'.

The guideline used in this audit or the recommendations of what *should* be being done are the 'Scottish Intercollegiate Guidelines Network' (SIGN) guidelines. SIGN aims to produce evidence-based guidelines derived from systematic review of the available literature to reduce variation in practice and improve outcomes in the NHS. Guidelines are written on topics in which there has been evidence of variation in practice affecting patient outcome that warrants development of guidance using a research base. The guideline on 'Management of Suspected Bacterial Urinary Tract Infection in Adults' (or SIGN 88)[1] was produced in July 2006 by Quality Improvement Scotland and it will be interesting to assess whether the guidance has been successful at reducing variance and increasing standards amongst General Practitioners.

Identifying the Clinical Problem

This audit aims to assess the management of acute uncomplicated lower urinary tract infection (LUTI) at a Health Centre in Central Scotland, over the months of September and October 2011. This is a semi-rural Practice in Central Scotland with a practice population of 10,000 patients. It has 7 partners, 3 nurses, 3 part-time nurses, and 2 health care assistants in employment.

Common signs and symptoms of UTI are dysuria, frequency, urgency, suprapubic tenderness and haematuria. Symptoms indicating upper UTI (UUTI) are loin pain/flank tenderness and

fever or rigors.[2] The organisms commonly causing infection in acute uncomplicated infection are E.coli (in 65-80%), proteus, klebsiella, enterobacter, candida, enterococci and staphylococci. In complicated UTI's more unusual organisms are found such as pseudomonas aeruginosa or staphylococcus epidermidis. Infection with chlamydia trachomatis should be considered in sexually active men and women.[3] UTI is the second most common clinical indication for antimicrobial therapy in both primary and secondary practice after respiratory tract infection.

The cost of antibiotic treatment in UTI is only 13% of the total primary care costs of management of uncomplicated UTI, and the major cost comes from a GP consultation.[4] Ways of reducing the overall cost of management of UTIs in primary care centres around decreasing the number of women seeing a doctor in a face-to-face consultation for this complaint. However, a key recommendation by the Department of Health Advisory Committee was to reduce antibiotic prescribing over the telephone.[1] On the other hand retrospective analysis of outcomes of acute cystitis managed by telephone protocol showed the outcome to be successful for the majority of women.[5] A randomised controlled trial also provided evidence noting that a telephone consultation with an experienced nurse practitioner is just as safe and effective as a standard GP consultation.[6]

Problems surrounding investigation of UTIs include clarifying when it is appropriate to perform urinalysis and when it is appropriate to send a mid-stream sample of urine (MSSU) to the laboratory for culture and sensitivities. It is important to consider the importance of investigating urinary tract complaints. For example, advocating urinalysis in an asymptomatic or minimally symptomatic person is not advisable as SIGN guidelines notes that bacteriuria alone should not be used to diagnose a UTI, only symptoms and signs can do this.[1]

This guideline states[1] that: *'Dipstick tests should only be used to diagnose bacteriuria in women with limited* (2 or less) *symptoms and signs.'* If a positive result for leucocytes or nitrites is found in a patient with just 1 symptom of a UTI, then there is an 80% likelihood of bacteriuria, and treatment should be given as per guidelines for LUTI. The positive predictive value was found to be 92% for positive results of nitrites and either leucocytes or blood in 493 female patients in Southampton.[7] However, the main problem with urinalysis lies in the poor negative predictive value of the test meaning that healthcare practitioners should ensure that they only investigate symptomatic patients.

UTIs are a significant burden to healthcare systems in terms of cost and time, and investigation should therefore only be requested when appropriate and necessary. A meta-analysis on microscopy and culture of urine in primary care showed no advantage to routinely requesting this in the majority of patients.[8] An MSSU is indicated in patients with symptoms or signs of an UUTI - that is with a history of fever or loin pain as is stated in SIGN guideline 88. MSSU should also be performed in patients with treatment failure after first line treatments for LUTI. According to the SIGN guideline[1], *'Patients who do not respond to trimethoprim or nitrofurantoin should have urine taken for culture to guide change of antibiotic.'*

SIGN guidelines state that empirical antibiotic therapy should be started in patients presenting with 2 or more symptoms indicative of UTI. The audit will assess whether this is the case or if urinalysis and MSSU are still done unnecessarily.

Length of antibiotic treatment can vary significantly, and is an area in which there did need to be guidance to achieve a standard treatment plan for uncomplicated UTIs. The SIGN guideline notes that, '*Non-pregnant women of any age with symptoms or signs of acute LUTI*

should be treated with trimethoprim or nitrofurantoin for three days.'[1] Longer courses of antibiotics may be necessary in women over 65 years old, pregnant women, and catheter-associated infection, but 3 days of treatment is sufficient for the majority of patients presenting. There will not be analysis of the specific antibiotics used in these patients, but the empirical guidelines for antibiotic therapy in the region are noted for interest in Table 1. There is currently much discussion over cost and benefit of antibiotics particularly as resistant strains of urological infection are rising in prevalence.

Table 1- Empirical Guidelines for Antibiotic Treatment of UTI in NHS Forth Valley

Urinary Tract Infections - QUINOLONES SHOULD NOT BE USED FIRST LINE FOR LOWER URINARY TRACT INFECTIONS IN WOMEN

	FIRST CHOICE	ALTERNATIVE	COMMENTS
Lower Urinary Tract Infection – Non pregnant female	Trimethoprim 200 mg bd oral	Nitrofurantoin 50mg qds oral or Cefalexin 500 mg bd oral	3-day course for women. 7 day course in elderly. Second line depends on sensitivity of MSSU
Lower Urinary Tract Infection - males	Ciprofloxacin 500mg bd oral	Second line depends on sensitivity of MSSU	**Men with febrile UTI or recurrent symptoms may require treatment for 14 days (SIGN 88)**
Lower Urinary Tract Infection – pregnant female	Cefalexin 500mg bd oral	Co-amoxiclav 375mg tds oral or trimethoprim 200mg bd oral (avoid in first trimester)	Treat if symptomatic UTI or asymptomatic bacteriuria
Catheter related	Avoid treating catheter – related bacteriuria if the catheter is long-term. Treat if manipulation of catheter is planned or if clinical evidence of infection is present. Obtain sensitivity from culture results prior to treatment. Change catheter during treatment for symptomatic UTI if not been changed in the preceding few days.		

All women presenting with urinary symptoms should be asked about vaginal itch and discharge, as if these are present the probability of bacteriuria being the cause of urinary symptoms falls. Alternative diagnoses such as sexually transmitted infection and vulvo-vaginitis (eg-thrush) are more likely and other investigations are indicated (swabs). The SIGN guideline notes, '*In women with symptoms of vaginal itch or discharge, explore alternative diagnoses and consider pelvic examination.*'[1] Patients should be asked about vaginal symptoms when presenting with urinary symptoms, as they should be to exclude STDs or vulvovaginal infection.

Criterion & Standards

Population Eligible for Participation:

- Patients presenting to this health centre
- Between dates 1st September- 31st October 2011
- Female
- Age ≥16 and ≤65

Populations Excluded from Participation:

- Males
- Pregnancy
- Children under 16 years old and older patient over 65 years old
- Nursing-home patients
- Patients with recurrent/complicated UTIs
- Catheter-related UTIs

As discussed previously, there are 6 variables data will be gathered on, standards set, and then outcome assessed.

- **Telephone appointments are appropriate for antibiotic treatment of simple lower UTI - 50% audit standard**
  Telephone consultation is as effective and safe as a GP clinic consultation, and improves cost-effectiveness of General Practice, however the standard of only 50% is set as patients may not be aware of the availability of telephone appointments.

- **Upper UTI symptoms (loin pain and fever) should be screened for in all patients presenting with urinary symptoms – 80% audit standard**
  These questions must be asked to exclude pyelonephritis which requires different and longer courses of antibiotics than uncomplicated lower UTI, and if missed could mean the patient is inadequately treated and suffers complications of infection including permanent renal impairment.

- **All patients should be asked if abnormal vaginal itch or discharge are present to exclude STDs as cause of urinary symptoms – 80% audit standard**
  Presence of abnormal vaginal itch or discharge indicates many other possible diagnoses that must be excluded before a management plan is formed. The expected standard is 80% as it should be mandatory for GPs to check this to exclude infection and STDs.

- **Patients presenting with two or more symptoms and strong clinical suspicion of UTI should not have inappropriate urinalysis - 90% audit standard**
  Urinalysis is not a diagnostic test for UTI and should only be performed if there are two or less symptoms present.

- **Patients with symptoms of upper UTI should have MSSU to guide antibiotic therapy - 90% audit standard**
  It is important that UUTIs are treated quickly and efficiently and MSSU should always be sent for culture and sensitivities if fever or loin pain symptoms are present to guide antibiotic treatment to avoid treatment failure and potential subsequent kidney damage.

- **Patients with symptoms of lower UTI and no symptoms of upper UTI should be given a 3 day course of antibiotic treatment - 90% audit standard**
  Three days of recommended antibiotic treatment is adequate for the treatment of lower uncomplicated UTIs and the expected standard is 90%.

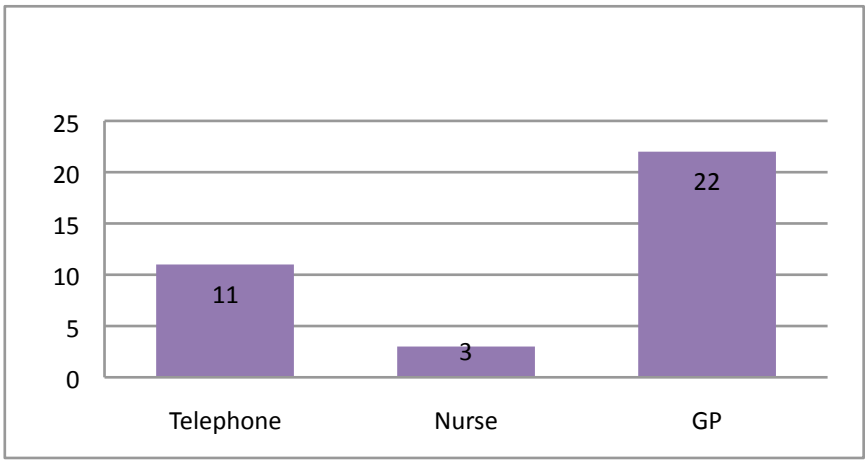
Data Gathering

Patients eligible for inclusion in the audit were identified by performing a search using the search and report tool on EMIS PCS. The results of the audit tool were analysed by comparing the variables. During the 2 month period, a total of 34 consultations occurred which were eligible to be included in the study. This was 27 patients and an additional 7 review appointments.

Consultation Type

The type of consultation was either telephone consultation (with doctor or nurse), nurse face-to-face, or GP face-to-face consultation. 22 patients had a GP consultation, 3 had a nurse consultation, and 11 had telephone consultations, as shown in the bar graph (figure 1) below.

Figure 1: Type of Consultation



Were Upper UTI Symptoms Screened For?

Indications of an UUTI should be screened for by asking the patient if they have suffered from loin/back pain, or fever as part of their symptoms. 'Present' is recorded if one or other was marked as present. 'Not present' is recorded if both are recorded as not having been present. The score was marked as 'not recorded' if only one is commented as absent, but not the other, or if neither are mentioned. In 6 consultations, one or both of these symptoms were present, in 9 consultations both symptoms were recorded as not present, and in the remainder – 19/34 consultations – the presence or absence of these symptoms was inadequately recorded. See figure 2.

Were Vaginal Causes Excluded?

For this variable the notes were assessed for whether vaginal discharge or itch were excluded in the notes. The symptoms were only asked about in 6/34 consultations, and in 3/6 of these further investigation was offered (chlamydia/gonorrhoea screening or pelvic examination). In 28 consultations it is not recorded whether these symptoms were asked about. See figure 3.

Figure 2: Discussion about upper UTI Symptoms during consultation

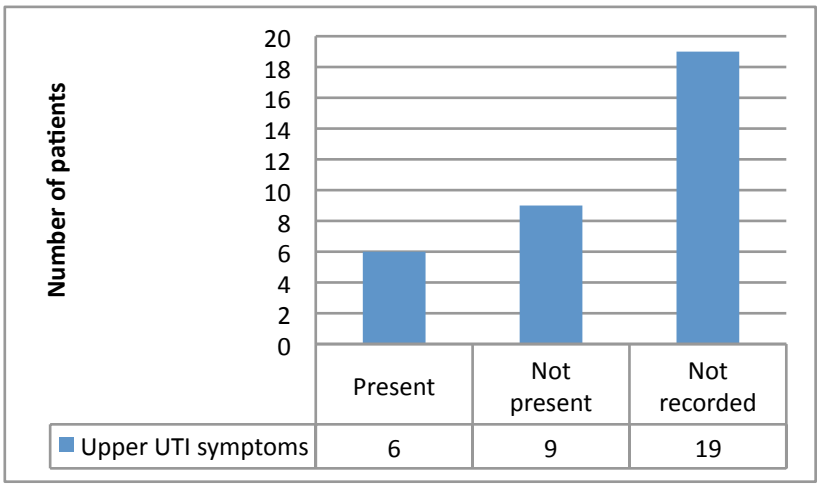
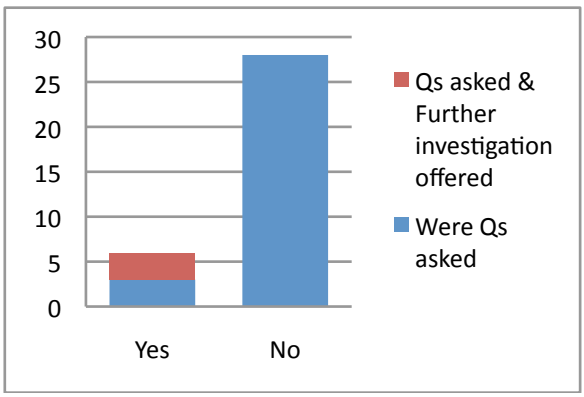


Figure 3: Was Vaginal Cause Excluded



The Use of Urinalysis

Out of 34 consultations, 8 patients had urinalysis performed on a specimen of their urine in total. 3 were inappropriate as these patients had >2 symptoms present so urinalysis was not required. 5 had appropriate urinalysis – there were 2 or less symptoms present and urinalysis investigation can be done if clinical suspicion exists. It is difficult to include numbers for urinalysis being inappropriately *not* done, as no patients had 1 symptom, although many had 2 but perhaps a greater clinical suspicion of UTI meaning the healthcare professional didn't request urinalysis for confirmation as it was deemed unnecessary. See figure 4.

Appropraite Urine Culture

The total number of samples of MSSUs sent to the laboratory for culture and sensitivities was 8 samples. They should be sent if fever or loin/back pain was present, or if there is no response to antibiotic treatment and the patient returns with the same symptoms. See figure 5.

Figure 4: When was Urinalysis Performed?

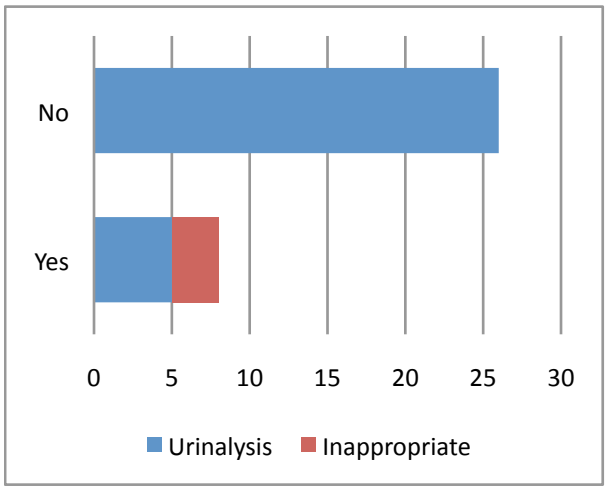
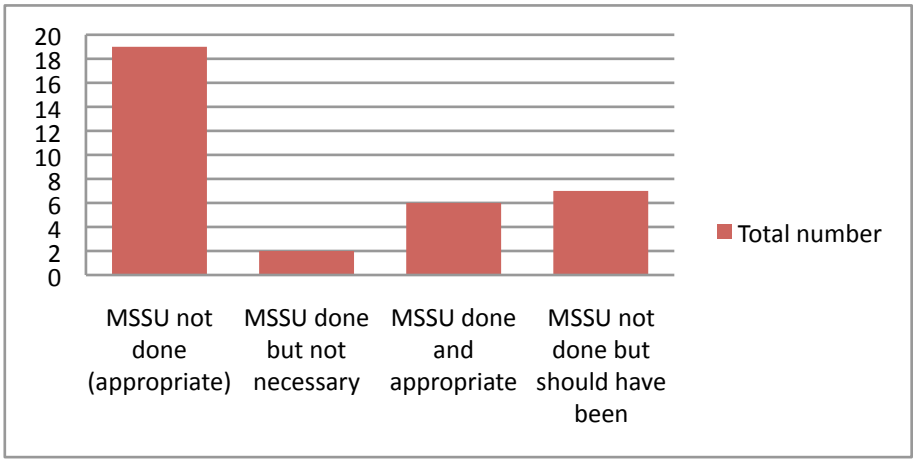


Figure 5: Mid-Stream Specimen Urine Samples (MSSU)



Antibiotic Treatment Length

It is recommended antibiotics should be prescribed for 3 days for treatment of LUTI. In 4 consultations out of the 34 in the study, 3 days of antibiotics were given when symptoms possibly indicating an UUTI were present. In 8 consultations patients were given a course of antibiotics for >3 days (either 5 or 7 days). In one of these 8, the patient herself requested a longer course as she felt in the past 3 days hadn't been sufficient to treat infections. The other 7 were either patients returning within 15 days of previous symptoms complaining of similar symptoms, or patients in whom fever or loin pain (indicating possible UUTI) were present, and so are deemed 'appropriate'. One patient was given no antibiotic treatment as she presented for the third time with further similar symptoms only 6 days after last course of antibiotics and treatment was delayed to send MSSU.

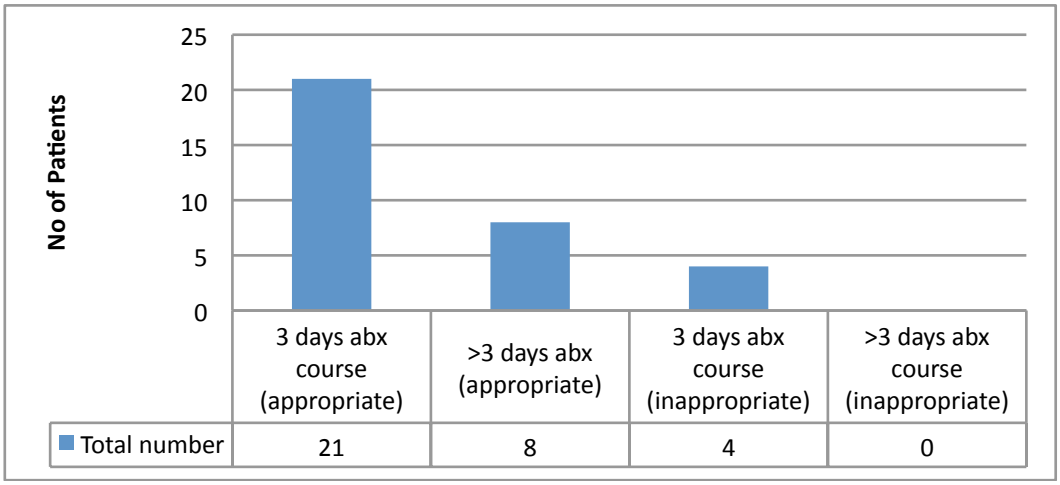


Figure 6: Antibiotic Treatment Course Length – Appropraite Or Not

Comparison of Performance Against Audit Standards

- **Telephone appointments are appropriate for antibiotic treatment of simple lower UTI - 50% audit standard [Not Achieved]**
  The practice did not achieve the audit standard, as only 32% of consultations for UTI were done by telephone. 9% were nursing consultations and the remainder were GP consultations in the surgery. There is no policy for screening the reason patients request an appointment with a GP when they phone in or make the appointment at reception, so this lack of patient awareness may account for the large percentage of appointments with the GP rather than phone appointments.

- **Upper UTI symptoms (loin pain and fever) should be screened for in all patients presenting with urinary symptoms – 80% audit standard [Not Achieved]**
  The practice did not achieve this audit standard; upper UTI symptoms were not adequately commented on in 56% of consultations that took place in the group. Of the total 56% some doctors may have recorded just one symptom as 'not present' but not excluded the other, which is inadequate to exclude UUTI. Many healthcare professionals probably question the patient on these symptoms but then forget to record them in the patient notes (especially if they give a negative response) that may contribute to this poor result.

- **All patients should be asked if abnormal vaginal itch or discharge are present to exclude STDs as cause of urinary symptoms – 80% audit standard [Not Achieved]**
  The standard was not achieved; in only 18% of consultations were vaginal symptoms recorded in the notes as present or absent. Similarly to criterion number 3, the healthcare professional taking the consultation may omit negative response information that may account for the poor results. Some healthcare professionals may be more apprehensive about asking older women this type of personal question than younger women (indeed, 5 out of 6 women asked were <25 years old), but it is important to ask these questions to exclude vaginal infection as well as STDs and it's essential to rule out these differential diagnoses.

- **Patients presenting with two or more symptoms and strong clinical suspicion of UTI should not have inappropriate urinalysis - 90% audit standard [Achieved]**
  The Practice achieved this audit standard. Only 9% of patients had inappropriate urinalysis out of the total group. Urinalysis was performed in 24% of consultations,

but the rest of the group was appropriate. Some patients may bring in a urine sample with them to the consultation if they are suspicious they may have a UTI and their urine may be analysed for this reason accounting for the 9%. Professionals should refrain from dipping it if unnecessary to actively discourage patients from bringing it, as this may also cause patients to believe they need to see a GP rather than have a telephone appointment.

- **Patients with symptoms of upper UTI should have MSSU to guide antibiotic therapy - 90% audit standard [Not Achieved]**
  The practice did not achieve this audit standard. 6 patients answered 'yes' or were confirmed on examination of having either loin pain or fever or both. Of these 6, 2 (33%) had MSSU sent to the laboratory. Overall 74% of consultations were managed correctly with respect to MSSU, with either appropriate samples being sent, or samples not being sent when not required. Samples were also sent from patients returning with recurrent or non-resolving symptoms that is clinically appropriate.

- **Patients with symptoms of lower UTI and no symptoms of upper UTI should be given a 3 day course of antibiotic treatment - 90% audit standard [Achieved]**
  This standard was achieved with 100% of patients presenting with symptoms of LUTI without upper UTI symptoms being given the appropriate 3-day antibiotic course.

Implementing Change & Improving Clinical Practice

The audit results demonstrate some lack in compliance with current recommendations. The variables analysed in the audit tool are mainly factors that rely on the doctor or nurse recording data in the computer.

Methods of increasing the number of consultations achieving the audit standard are by:

- Increasing patient awareness about telephone consultations for UTI which can be achieved by including this in patient information leaflets and on the Practice website which many patients use for repeat prescriptions and making appointments.
- Encouraging doctors and nurses to record negative as well as positive symptoms and signs, particularly fever, loin pain, and vaginal symptoms.
- Encourage doctors to follow the SIGN guidelines for urinalysis to improve this standard further.
- Further guidance on the appropriate indications for MSSU.
- Use SIGN guidelines and local protocol for antibiotic treatment awareness.

To complete the audit cycle, this subject could be re-audited next year to allow for the learning points of criteria not meeting the audit standard to be changed within the Practice. The practicalities of recording all data is something GPs and nursing staff should always try to do, as some differential diagnoses are important to exclude as well as include. Finally, this audit notes that following clinical guideline recommendations reduces practice variation, and is associated with reduced deaths and hospitalizations.[9] However, a recent study noted that American clinical guidelines rarely addressed co-morbidity, and adherence to guideline recommendations in caring for an older person with multi-morbidity would often lead to complex and sometimes contradictory drug regime.[10] Therefore this audit also notes the importance of clinical judgement in conjunction with following evidenced based protocols/guidelines.

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