The department of Podiatric Surgery in Doncaster has always been keen to assess patient outcomes following surgical intervention. The standard tool for data collection in podiatric surgery within the UK is PASCOM (Podiatric Audit of Surgery and Clinical Outcomes). This system was introduced to Doncaster for routine data collection in 2004, although it was not fully implemented until September 2006. Here are presented the PASCOM data collected between September 2006 and May 2010. The department’s audit processes are also considered and recommendations made for future audit practices.

AUDIT PROCESS
The audit process was built around the PASCOM database. It was devised by David Tollafield in the 1990s and captured data relating to patient demographics, surgical activity, complication rates and patient satisfaction. At the time of the study, users of the system were required to enter data into a customised Microsoft Access Database. In 2010 the system was overhauled and rebranded PASCOM-10. The system is now accessible online at www.pascom-10.com and has a much wider scope incorporating conservative treatment, diagnoses, injection therapies, and patient-reported outcomes.

The PASCOM Microsoft Access database was used for both data entry and analysis. Additional analysis was undertaken in Microsoft Excel and with Analyse-it Version 2.2. The audit data were initially collected in paper form and input on the database retrospectively. Prior to commencement, local approval was sought from the employing Health Trust for the introduction of clinical audit.

Three key points for data collection or activity were identified. The first point of data collection was in theatre when procedure data were collected alongside other variables (see Table 1). The second point occurred in the post-operative phase when data relating to the post-operative recovery were collected, again in paper form.

The final point occurred at the final check or discharge appointment, which occurred at 3 months for minor procedures (e.g. hammer toe repair, nail surgery, minor soft-tissue procedures) or 6 months for major procedures (ostotomies, arthrodesis). During the final check appointment, patient satisfaction was measured with the PASCOM patient satisfaction questionnaire (PSQ-10).

THE DEPARTMENT
The department is led by a consultant podiatric surgeon and is also a registered podiatrist who undertook nail surgery procedures. PASCOM does allow for analysis of outcomes for individual clinicians, though for the purposes of this study we were primarily interested in the summary data. The department currently offers day case surgery at Mexborough Montague Hospital. Treatment was typically provided under local anaesthesia.

AUDIT RESULTS
Demographics
During the audit period, 1589 patients attended for treatment and were entered into PASCOM. The majority (79.5%) of patients were female. Figure 1 demonstrates the range of age groups treated; 71.4% of patients were below retirement age. Demographic data was incomplete for a total of 35 (2.2%) patients. Missing data is discussed further in ‘Lessons Learned’.

As would be expected for elective day care surgery, patients attending for treatment were for the most part systematically well or had minor well-controlled systemic disorders. Health status was summarised by the American Society of Anesthesiologists (ASA) grading scale. ASA grades range from 1 (good health) to 6 (a brain dead patient). ASA grades 1 and 2 accounted for 98.3% of patients; only 1.7% (26) patients were graded ASA 3. As such it can be assumed that the majority of podiatric surgery patients were generally in good health with only mild systemic disorders. ASA data were missing for 4% of patients.

Surgical activity
Figure 2 provides a summary of the Surgical procedures undertaken during the audit period. A total of 2952 surgical procedures were performed on 1589 patients. The mean number of procedures per patient was 1.86. Hallux valgus and digital deformities accounted for 60.6% of surgical activity. Hallux valgus was most commonly corrected by the scarf operation. Internal fixation was routinely employed following osteotomy or arthrodesis, to allow an early return to weight bearing. A total of 2248 fixation devices or implants were inserted during the study period. The most common form of fixation was standard AO screws, accounting for 1675 implants. Kirshner wires were also routinely applied (266). Joint replacement surgery for hallux rigidus was rarely performed, accounting for only 0.7% of procedures. The preferred implant was the Swanson-type hinged double-stemmed silicone device; 22 of these were inserted.

There was a significant failure to collect the complete PASCOM data set pertaining to surgery. As a consequence, the diagnostic imaging and revisions reports have been excluded here. Failing to record revision surgery is a significant oversight because the rate of revision surgery could be considered an indirect guide to the long-term success or failure of surgical intervention within a given department.

Additionally, revision surgery is considered to be more technically demanding and at risk of further complications, potentially skewing complication rates or patient satisfaction.

In addition to local anaesthesia, medication was typically supplied to patients at the time of their surgery. This fall into three broad categories: analgesics, anti-inflammatory drugs and antibiotics. A total of 2724 separate entries were recorded for medication, equating to 1.7 medications supplied to each patient. The most commonly used medication was codeine (10/500mg, which was supplied on 921 occasions. NSAIDs were also frequently utilised in the form of either ibuprofen or diclofenac. Fluclonacillin was the most commonly used antibiotic for prophylaxis, followed by erythromycin and clindamycin.

Post-operative data
Post-operative data collection included a note of the care received and any complications that may have developed. Unfortunately, 507 (31.9%) patients had no post-operative data collected for their episode and so for the purposes of the audit were considered lost to follow up. This can occur in a busy clinic when clinical activity takes priority over audit activity. However, such an oversight reduces the accuracy of, for example, complication reports.

Table 2 demonstrates the required complications following podiatric surgery. Complications were recorded in clinic as and when they occurred. However, not all patients returned to the department for management of complications. Post-operation, patients may call on the services of their GP or accident and emergency for treatment. Acknowledging this possibility, patients are subsequently questioned at their final check to minimise under reporting. However, it is accepted that the combination of patients lost to follow up and shared care may result in under reporting of complications.
Infection, pain and thromboembolic events are perhaps the three most significant complications that can occur following podiatric surgery, given the impact they may have on a patient's quality of life and their ability to cause ongoing morbidity.

Although the proven infection rate was 0.42%, the suspected rate was considerably higher at 2.44%. Other published audits of podiatric surgery have reported proven infection rates of between 1.3 and 2.0%. The incidence of suspected infection has previously been reported at 3.3%, while guidance from NOCE (Guideline 74; Surgical Site Infection) suggests that at least 5% of patients will suffer an infection following surgery.

A proven infection is one with a microbiological confirmation following culture and sensitivity testing. A suspected infection is a wound that clinically appears to be infected. The most significant complication of post-operative pain is Complex Regional Pain Syndrome (CRPS). This devastating complication is rare, affecting only one patient in this study (0.07%). This figure compares well with previous studies which have reported rates between 0 and 0.12% following podiatric surgery. It is accepted that podiatric surgery is a risk factor for deep vein thrombosis (DVT). In an attempt to minimize this risk we actively prophylax patients who are at increased risk. Methods employed include increased compression stockings and heparinisation. The risk in podiatric surgery has previously been considered low with a reported incidence of 0.3%. There was only one confirmed DVT in the current audit.

Final check appointment

The final check appointment occurred during or within 3 months following surgery. This gives the clinician an opportunity to review the patient, record any delayed complications and consider the success or failure of the procedure and plan for any further treatment. Unfortunately, as with the post-operative data, there was considerable loss to follow up at final check, with data missing for 549 (34.5%) patients. It is not possible to determine from the database if patients were truly lost to follow up (failed to attend) or whether there was a failure to implement the audit process.

PSQ-10

The final check appointment also offered an opportunity to assess patient satisfaction, using the PASCOM Patient Satisfaction Questionnaire (PSQ-10). The PSQ-10 was developed by Tollfield & Rudge to assess surgical outcomes from the patient’s perspective. The questionnaire asks a number of questions pertinent to the patient’s experience and generates a summary score, with a maximum possible of 100. This has not been formally validated, although it is a reliable measure with little degradation over time. The scores are typically skewed, as can be seen in Figure 4. Various threshold values have been described for PSQ-10 scores, with a score above 70 considered acceptable. Nonetheless, this score is not a direct measure and is one sided (only measuring the positive aspects). The questionnaire is an important question for patients and clinicians. Poor shoe fitting is a key reason for patients to seek advice from a podiatric surgeon.

Return to footwear following surgery can also be considered an indirect marker for return to activity. By 6 weeks post operation, 58% had returned to shoes. This point coincides with bone healing and the stage at which we recommend a return to full activity levels following routine forefoot surgery. By 8 weeks, 83% were wearing shoes; 14% of patients took 6 months to return to shoes. Five patients (0.48%) felt that they could not wear shoes at the time of questioning.

LESSESS LEARNT

This audit has demonstrated high levels of satisfaction with podiatric surgery, performed as a daily care procedure under local anaesthesia. Few patients report serious problems following surgery, and few complications were noted. However, the significance of the missing 31.9% of patients with no follow-up data at all and the 34.5% of patients with no final check data must be considered. Difficulties in following up patients after treatment are well reported; earlier audits of podiatric surgery have reported follow-up rates of between 38.3% and 95.8%. The loss to follow up does weaken confidence in the results. We cannot be certain whether missing patients were satisfied with their outcome or whether they suffered complications and sought treatment elsewhere. Nonetheless, there is an emerging trend towards high levels of satisfaction.

A second problem with the current audit, particularly assessment of outcomes, was the reliance of the PSQ-10 to determine the success or failure of treatment. This is not good science. The PSQ-10 was not developed as an outcome measure and is one sided (only measuring patients after treatment). A thorough audit should treat a patient as a validated instrument for assessing outcomes and, alongside the PSQ-10, clinicians involved in patient care should also have an opportunity to comment on the success or failure of treatment.

A third problem occurred with data collection. There was a systemic failure to collect relevant data at the time of surgery. This may significantly affect the PASCOM reports relating to investigations, revision episodes, demographics, and duration analysis.
The current audit results will serve as moving forward.

Table 4.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Target</th>
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</thead>
<tbody>
<tr>
<td>Final Check</td>
<td>6 months</td>
</tr>
<tr>
<td>Loss to Follow up</td>
<td>30%</td>
</tr>
<tr>
<td>Proven infection rate</td>
<td>&lt;2%</td>
</tr>
<tr>
<td>CRPS</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>Improvement in MOXFQ scores (new)</td>
<td>&lt;0.3%</td>
</tr>
<tr>
<td>Clinicians Analysis of Outcome (new)</td>
<td>Aims wholly met &gt;80%</td>
</tr>
</tbody>
</table>

Table 4. Benchmark targets

Table 4.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSQ-10</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>DVT</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>PSQ-10</td>
<td>&gt;85%</td>
</tr>
<tr>
<td>TBC</td>
<td>&gt;85%</td>
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</table>

MOVING FORWARD
The current audit results will serve as benchmark for future studies against which improvements can be measured.

Table 4 details the benchmark targets for future audits. The department has since adopted the latest incarnation of PASCOM (P-10). This has a number of advantages over earlier systems. First, it is entirely web-based, allowing for instant or live data inputting, so there is no longer a need to input data in paper form and transfer to a database, which was always considered a risk for errors. With the new system, surgical data are entered by the surgeon at the time of surgery directly into the online system. Further to that, the system has built-in prompts and checks that attempt to minimise data loss. For example, basic demographic data must be saved before moving onto input procedure data. P-10 also has the additional advantage of being able to generate outcome reports for individual patients at the time of their final check appointment. This immediately highlights any concerns, such as low PSQ-10 scores, which can then be flagged for further assessment.

There are also a number of significant additions to P-10 over earlier versions, including a validated outcome measure in the form of the Manchester Oxford Foot Questionnaire (MOXFQ). The current government has put a particular emphasis on ‘outcomes’ and ‘quality’ in healthcare provision, systems such as PASCOM, which capture patient reported outcomes, are consequently invaluable in providing evidence for quality service provision.

Adopting a new audit tool was only part of the process of improving audit. Administrative systems also had to be in place to ensure that those patients requiring final checks were offered an appointment. P-10 monitors the numbers of patients waiting for follow-up appointments and those with missing outcomes. These data are made available to clinic administrators, who can then ensure that the right numbers of clinic slots are available for every four-week period of surgery. P-10 also allows for monitoring of loss to follow up, so again we have put administrative mechanisms in place to capture these patients and limit loss. Finally, all clinical and administrative staff have received training in PASCOM, and audit has been prioritised as a departmental objective.

CONCLUSION
This report has demonstrated the audit results for podiatric surgery over a four-year period. Overall, patients were highly satisfied with the outcome of treatment.

Podiatric surgery is a safe option for the treatment of foot pathology. It is associated with a low number of complications, very little post-operative pain and a rapid return to footwear. However, the audit system failed to follow up a significant number of patients and there was a systematic failure to collect certain data sets. As a consequence of this study, the department has overhauled its approach to audit and set key targets for data collection. We hope to publish our initial findings with the new audit system shortly.

REFERENCES