Setting up a unique outpatient parenteral antimicrobial therapy (OPAT) service

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Outpatient parenteral antimicrobial therapy (OPAT) refers to the outpatient or community-based management of an infection via the administration of intravenous (IV) antimicrobial drugs without an overnight hospital stay (Barr and Seaton, 2013).

OPAT can be used to treat patients with a variety of medical conditions in a variety of settings. It offers the opportunity for improved efficiency and patient choice through early discharge from hospital or the ability to avoid admission, while maintaining quality of care (Chapman, 2013). As the complexity of healthcare increases and public expectation intensifies, so the need to provide IV therapy in the community setting will continue to grow (Nazarko, 2013).

This article focuses on the development of a service with a unique patient-centred model of OPAT delivery. Using a case study approach, the authors will explore the development of the current OPAT model and the scope for future service improvement.

BACKGROUND

According to Chapman (2013), up to 4% of inpatients at any one time are in hospital solely to receive intravenous antimicrobial therapy. Treatment with OPAT in the community or outpatient clinic provides patients — who are otherwise healthy — with an alternative to staying in hospital for a prolonged period.

There are many benefits of OPAT (Chapman et al, 2012) including admission avoidance and reduced length of stay in hospital, with resultant increases in inpatient capacity, significant cost savings compared with inpatient care, reduction in risk of healthcare-associated infection, and improved patient choice and satisfaction.

Over recent years, the number of people being treated by OPAT services has increased as clinicians have gained expertise in the technique and new services have been developed (Nazarko, 2013). Future expansion of OPAT services is also being recommended by national and local policies to promote care closer to home through the development of integrated models of care (Chapman, 2013).

At the authors’ trust, an OPAT service for the treatment of simple cellulitis has been available for a number of years. More recently, however, the service has developed and expanded to include treatment for a wider variety of conditions with a greater choice of available medications (Table 1).

### Table 1: Variety of conditions and medications available with OPAT

<table>
<thead>
<tr>
<th>Range of conditions</th>
<th>Range of medications</th>
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<tbody>
<tr>
<td>Cellulitis</td>
<td>Penicillins</td>
</tr>
<tr>
<td>Bronchiectasis (abnormal widening of the bronchi — risk of infection)</td>
<td>Cephalosporins</td>
</tr>
<tr>
<td>Diabetic foot infection</td>
<td>Lipopeptide</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>Glycopeptide</td>
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<tr>
<td>Tuberculosis</td>
<td>Aminoglycosides</td>
</tr>
<tr>
<td>Bone and joint infections, i.e. infected joints, discitis (infection in the intervertebral disc space)</td>
<td>Quinolones</td>
</tr>
<tr>
<td>Deep seated infections i.e. meningitis, abscesses</td>
<td>Tetracyclines</td>
</tr>
<tr>
<td>Endocarditis (inflammation of the endocardium)</td>
<td>Antifungals</td>
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The authors’ organisation is an integrated healthcare foundation trust serving the communities of two hospital sites. The current OPAT service has been operational since October 2013 and has two different delivery models for the two communities, with each service commissioned by the local clinical commissioning group (CCG). One service is integrated with the district nursing service, whereas the other is provided by a social enterprise organisation working in partnership with the acute trust.

A diverse range of clinical information generated within the acute trust was used during the development of the OPAT service. This included information on diagnostic coding and length of hospital stays to ensure appropriate development of individualised plans of care in the OPAT service.

Collaboration with local commissioners to examine risk and benefits as well as capacity and demand is ongoing and patient numbers have been increasing on a yearly basis.

In line with good practice recommendations (Chapman et al, 2012), the service was established with careful attention to ensuring risks are minimised by robust clinical governance guidelines and quality assurance measures.

The case study featured here (see opposite) highlights some of the key issues that help to make the service unique (Chapman, 2013).

**PATIENT SELECTION CRITERIA**

With all patients, selection for inclusion in the OPAT service involves consideration of the following:

- Severity of infection
- Mobility
- Preexisting comorbidities
- Likelihood of compliance with the prescribed treatment (Barr and Seaton, 2013).

Paladino and Poretz (2010) suggested that patients receiving OPAT should have running water, Joan is a 53-year-old woman who has a longstanding history of osteoarthritis. She was otherwise healthy with no other comorbidities and worked full time as an office administrator. In 2014 she underwent surgery for a right total hip replacement and was discharged after a few days. Unfortunately, she experienced persistent wound infections and was diagnosed with infected metalwork in the replacement hip and readmitted to hospital for management.

Following discussion between the microbiology department and orthopaedic surgical consultants, it was decided she required a six-week daily course of the antibiotic ertapenem. Discharge planning took place over the next couple of days, including insertion of a peripherally inserted central catheter (PICC) and referral to the OPAT service.

Following discussion with the lead nurse for OPAT, a bespoke treatment plan was agreed, including completion of the pathway and preliminary discussions around when and where she would receive her treatment. The following treatment options were discussed with Joan: to receive OPAT at home; to attend an ambulatory clinic before or after work; or to receive OPAT in a suitably prepared area at work.

As Joan was recovering she initially opted to have her treatment at home. However, she was keen to return to work as soon as she felt well enough, so it was agreed that the team would deliver the remaining treatment at her work.

Once all her discharge arrangements had been finalised, Joan was discharged home with supplies of ertapenem, diluents and all the equipment required to deliver the treatment, i.e. needles, syringes etc. She was able to convalesce at home with her family and receive daily IV ertapenem administrations from the community nurses.

The discharging orthopaedic surgical consultant retained clinical responsibility for Joan for the duration of her OPAT. Joan had weekly blood samples taken from her PICC line and the results of the tests were reviewed weekly at the OPAT virtual ward round, to monitor the effectiveness of the antimicrobial treatment.

Following the completion of her OPAT and after her final end-of-treatment review by the orthopaedic surgical consultant, the community nurses removed her PICC line at home and gave her a patient satisfaction questionnaire. Her condition continues to improve.
adequate light and heat, access to a working telephone and transportation to attend review appointments.

It is also essential that nurses consider the criteria for exclusion from receiving OPAT (Table 2). These act as a safety measure to ensure that patients who may be at risk of complications or who are frail, lack capacity or have unstable comorbidities are cared for in an appropriate and safe setting (Nazarko, 2008).

**Clinical responsibility**

National good practice guidelines (Chapman et al, 2012) state that the OPAT team should have clear lines of responsibility for managerial and clinical governance issues.

The guidelines also say that the OPAT team should have an identifiable and medically qualified lead clinician with expertise in antibiotic therapy and dedicated time in their job description for their OPAT responsibilities. This is normally an infectious disease consultant (Nazarko, 2013).

The authors’ service has no access to an infectious disease unit. Instead, this expertise is provided by a consultant microbiologist, while the clinical responsibility for the patient remains with the discharging hospital consultant. In the case of the patient featured in the case study above, this was the orthopaedic surgical consultant.

**BESPOKE PLANS OF CARE**

It is recommended that services are organised around the interests of patients, are locally relevant and do not adopt a ‘one-size-fits-all’ approach (Chapman, 2013). While delivering OPAT in clinic settings can be more cost effective than home visits (Nazarko, 2013), it has also been demonstrated that home visits offer a more comfortable and productive alternative for patients, who may be able to return to their jobs or other daily activities during treatment (Paladino and Poretz, 2010).

The local service is provided primarily in the domiciliary setting, but is individualised to suit the needs of the patient (see case study on previous page).

Frequency of treatments may range from once to three times a day and can be given as an intravenous bolus lasting up to 5 minutes, or via an infusion lasting up to 30 minutes.

Patients can also choose to have treatments delivered in a variety of settings to suit them, including an ambulatory area in a healthcare premise; at home; at work; or in an outpatient or day-case setting. Referrals are accepted from clinicians nationwide, providing the patient resides in the OPAT service’s catchment area.

Antimicrobials can be administered through a variety of venous access options — including peripheral venous catheter (PVC), peripherally inserted central catheter (PICC) or skin tunnelled venous catheters (central lines) — depending on the patient’s blood vessel patency and health, the expected duration of the treatment, and patient choice.

**LEAD NURSE**

Liaison between the patient and both primary and secondary care teams is essential to ensuring that the process of discharging patients home to receive OPAT goes as smoothly as possible. Close involvement of the lead OPAT nurse — from initial planning stages through to the completion of the IV therapy — is essential.

This ensures that good communication links are maintained and any issues are appropriately managed in a timely fashion to minimise risk. Depledge and Gracie (2006) suggested that this coordinator role is pivotal to the success of OPAT and this is further supported in the OPAT good practice recommendations (Chapman et al, 2012), which stressed the importance of communication between all members of the OPAT team.

**OPAT KITS**

During the early stages of the development of the OPAT service, it was decided that the IV medications, diluents and all other consumables for the full duration of each patient’s OPAT course would be supplied by the hospital. This was aimed primarily at eliminating any time wasted by community staff trying to locate individual items before the therapy could be started.

In reality, it soon became apparent that items were being constantly omitted from prescriptions, mainly due to the varied range of equipment required for each patient’s care plan. After much discussion, the OPAT working party decided on the solution of using ‘OPAT kits’.

These boxes are made up by the local pharmacy manufacturing unit and include all the necessary equipment for each individual OPAT patient for each week. After some initial trialling, there are now a variety of boxes, including those for central lines, peripheral lines, and medications to be taken once and three times a day.

Table 2: Exclusion and caution criteria for OPAT

<table>
<thead>
<tr>
<th>Exclusion criteria for OPAT</th>
<th>Caution only</th>
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<tbody>
<tr>
<td>▶ Likelihood of non-compliance at home</td>
<td>▶ Hepatic and/or renal disease</td>
</tr>
<tr>
<td>▶ Sepsis</td>
<td>▶ Lack of telephone access</td>
</tr>
<tr>
<td>▶ Inability to manage at home</td>
<td>▶ Substance misuse</td>
</tr>
<tr>
<td></td>
<td>▶ Neutropenia</td>
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<tr>
<td></td>
<td>▶ Pregnant/lactating women</td>
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</table>
Examples of patient feedback

- ‘This was so much better than being treated in hospital. I was relaxed and felt more respected in my own home’

- ‘I was very happy to be at home and not in hospital, I am sure nothing more could have been done in hospital than wasn’t done in my own home’

- ‘The team were very good. They answered all the questions I asked and explained everything I needed to know. They were very gentle and caring in carrying out the whole procedure’

- ‘Thank you to all the team for their fantastic service and their care and consideration. Long may this service continue’

pharmacy staff. It also allows community nurses to schedule visits more accurately, which is essential with a prevailing climate of increased pressure to provide more community services, earlier hospital discharges and an ageing population with more chronic illnesses (Stuart et al, 2008).

COMMUNICATION

It is crucial that all teams have a clear leadership structure with defined roles and responsibilities, clear lines of communication, and cross-team collaboration (Miani et al, 2014). It is also vital that there is engagement from all clinicians involved in the planning and delivery of care, including hospital consultants, microbiologists and the patient’s GP.

The authors’ OPAT service has a comprehensive operational policy and there is regular communication with other teams such as anaesthetics, microbiology and central venous access device teams. These teams were also involved in the development of the service and its guidelines and strategies.

Monitoring

To monitor patients’ clinical response to antimicrobials, regular monitoring of patients receiving OPAT is essential (Tice, et al, 2004; Chapman et al, 2012). Good practice recommendations suggest that this includes daily monitoring of the patient by an experienced OPAT nurse, weekly blood tests, weekly multidisciplinary meetings and virtual ward rounds (Chapman et al, 2012). However, the standards also recommended that decisions about the precise frequency of reviews should be left to individual OPAT teams.

In the authors’ organisation, the process for patient monitoring is as follows:

- All patients on the OPAT caseload are discussed at the weekly multidisciplinary virtual ward round. This involves a review of blood results and any relevant investigations by the consultant microbiologist. Any relevant findings are then discussed with the responsible consultant.

- The precise level of monitoring required is condition-specific and dependent on the needs of the individual, for instance a patient with a high risk condition such as endocarditis (inflammation of the inner lining of the heart) would require more regular monitoring than a patient with uncomplicated cellulitis. The monitoring requirements are clearly defined in the patient’s bespoke plan of care, which accompanies the patient for the duration of their treatment. This ensures that patients are appropriately monitored and minimises the inherent increased risks associated with OPAT (Chapman et al, 2012; Chapman, 2013).

- The patient’s final review is performed by the responsible consultant to determine any ongoing treatment plans.

Patient feedback

Monitoring patients’ views of the OPAT service is necessary to ensure that it remains truly patient-focused. In keeping with the OPAT good practice recommendations (Chapman et al, 2012), upon completion of their treatment, all patients receive a satisfaction questionnaire incorporating NHS England’s ‘friends and family test’ (NHS England, 2014) (p. 10); the principle being that people who use NHS services should have the opportunity to provide real-time feedback on their experiences.

This feedback is then made available to staff and local commissioners in the form of a monthly report to inform decision-making and choice for patients. The local OPAT service has received universally positive feedback (see patient feedback box above).

PLANS FOR FUTURE DEVELOPMENT

Ongoing plans for future development of the local service reflect good practice recommendations, in that all OPAT services should provide high quality, low risk care whatever the setting (Chapman et al, 2012).

While the local service has grown considerably since its inception, there remains considerable scope for increase in capacity to achieve the main focus of allowing patients to have a shortened hospital stay — or to avoid hospital altogether — and an improved quality of life (Gilchrist and Seaton, 2014).

Essential to demonstrating the delivery of a safe, efficient and cost effective service, is the collaboration between the health informatics and OPAT teams in developing a robust and reliable online data collection tool which links to the electronic patient record. This will be used to record activity data such as adverse reactions, vascular access...
complications and clinical outcomes. Any data will also be shared with relevant key stakeholders both locally and nationally, e.g. clinical commissioning groups and the OPAT national registry (Chapman et al, 2012).

Further local plans for development include an electronic referral process to improve communication links between primary and secondary care, which will in turn provide more efficient risk assessment and audit.

**CONCLUSION**

There has recently been a significant shift in the provision of health care from the hospital to the community setting, and, in response to this, the local trust has developed an OPAT service with a unique model of delivery (O’Hanlon et al, 2008). The local service continues to plan future developments that will promote growth and efficiency in an already successful and patient-centred model of care.

**REFERENCES**


**KEY POINTS**

- Up to 4% of inpatients at any one time are in hospital solely to receive intravenous antimicrobial therapy.
- Outpatient parenteral antimicrobial therapy (OPAT) can be used to treat patients with a variety of medical conditions in a variety of settings.
- It offers the opportunity for improved efficiency and patient choice through early discharge from hospital or the ability to avoid admission, while maintaining quality of care.
- Treatment with OPAT in the community of outpatient clinic provides otherwise healthy patients with an alternative to staying in hospital for a prolonged period.
- Over recent years, the number of people being treated by OPAT services has increased as clinicians have gained expertise in the technique and new services have been developed.
- Monitoring patients’ views of the OPAT service is necessary to ensure that it remains truly patient-focused.

**WHAT’S YOUR NEXT STEP?**

To use the knowledge that you have gained from this article to inform your continuing professional development (CPD), you should take the following steps before logging onto the website (www.jcn.co.uk/learning-zone/) to take the learning zone test:

**Reflect**

Do you understand some of the issues with providing IV antimicrobial therapy in the patient’s home?

What are the some of the main problems associated with running an OPAT service?

**Evaluate**

Do you appreciate how the patient can be positively affected by being able to be treated at home?

**Act**

Read the article when you have a spare few minutes in the day. Make some notes on what you have learned, then visit the online test (www.jcn.co.uk/learning-zone/) to complete this subject.

The whole test, which involves reading this article and answering the online questions, should take you 90 minutes to complete.

Finally, download your certificate to show that you have completed this JCN e-learning unit as part of your CPD portfolio.

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