The British Society for Antimicrobial Chemotherapy Outpatient Parenteral Antimicrobial Therapy National Outcomes Registry System (NORS) User Guide

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1. ABOUT NORS

1.1 Introduction to NORS

The National Outcome Registry System (NORS) is an Outpatient Parenteral Antimicrobial Therapy (OPAT) registry developed by the British Society for Antimicrobial Chemotherapy (BSAC) as part of the BSAC OPAT Initiative. NORS provides the most comprehensive overview of OPAT service provision across the UK and Ireland by enabling OPAT services to benchmark their service with other services both regionally and nationally.

A well-managed OPAT service should be able to report clinical success and bed days saved, as well as key organisational outcomes. Such data will better inform the organisation and stewardship programme, supporting or helping to refine antimicrobial choices and OPAT service delivery models. Larger-scale comparisons could be made to validate & benchmark these observations via participation in national and international OPAT registries.

An effective OPAT registry would also have the advantage of highlighting:

- promoting and amplifying good antimicrobial prescribing practices
- particular antimicrobial-associated adverse events
- service readmissions

For more information about the BSAC OPAT Initiative visit: e-OPAT.com

NORS can be accessed at: opatregistry.com

Participating OPAT services within the UK and Republic of Ireland can:

- enter data at any time
- compare and benchmark their own data with data from other contributing services, both regionally and nationally
- demonstrate the value of their service to Commissioners
- use data to:
  - support service expansion
  - improve stewardship
  - develop shared learning
  - improve patient outcomes

NORS is:

- free of charge to use
- accessible for data entry and analysis at any time
- easy to use since any OPAT service can enter data, regardless of the method(s) used for data collection

NORS data comparison comprises:

- Total number of patient episodes
- Total number of treatment days saved
- Mean Length of Treatment
- Primary Infective Diagnosis
- Antimicrobial agents used
- Infection and OPAT outcomes as defined by the BSAC OPAT good practice recommendations
- Requests and presentation of data is quarterly by calendar year

NOTE: NORS is fully supported by the following operating systems: Internet Explorer 8 (and above), Chrome, Firefox & Safari. If you are using early versions of Internet Explorer we advise using another browser i.e. Chrome.
1.2 Entering data into NORS

1.2.1 Data entry fields

The required data set comprises:
- Primary Infective Diagnosis (PIDs), including:
  - Antimicrobial agents used, including:
    - the total number of patient episodes
    - the total number of antimicrobial treatment days
  - the total number of treatment days saved
  - the total number of infection outcomes
  - the total number of OPAT outcomes
- Adverse reactions (line and drug)

For a detailed list of all NORS data entry fields please refer to the Appendix of this document.

All data submitted to NORS is anonymous and does not contain patient identifiable information. NORS correlates reports and data from all submitting OPAT services.

1.2.2 NORS disclaimer/Terms and Conditions

Please read the Disclaimer / Terms and Conditions for NORS. The use of NORS indicates you have read, fully understood and agree to all terms and conditions.

You can access the disclaimer in the “Downloadable Files” section on the NORS homepage at: opatregistry.com

1.3 The NORS homepage

The NORS homepage shows a complete summary of all data entered. The data is represented separately for adult and paediatric OPAT services (Figure 1).

Summary data from contributing services is displayed as follows:
- The total number of OPAT patient episodes
- The total number of OPAT treatment days saved
- The total number of adverse reactions

From the NORS homepage (Figure 1) you can:
- Register your OPAT service if this is not already listed
- Register as a user
- Login to enter and view data
- Access additional information via the “Downloadable files” section

Figure 1. The NORS homepage
1.3.1 Registering to use NORS

**NOTE: You will not be able to enter data to NORS unless you have registered to use the site.**

If you are already registered to use NORS please go to Section 1.4.

Access NORS at: opatregistry.com

To register click on the “REGISTER” button (Figure 2)

![Figure 2. Registering to use NORS](image)

1.3.1.1 Registering as a user

Enter your First Name, Surname & Email address* (Figure 2a) then click the “Register” button

*Only email addresses administered by healthcare services across the UK & Ireland are valid for registration on NORS i.e. nhs.net, nhs.uk, hscni.net

![Figure 2a. Registering as a user](image)
1.3.1.2 Confirmation of registration
An email will be sent to your registration email address, this will contain a link to confirm and process your registration (Figure 2b)

If you have not received an email within a few minutes check your junk/spam folder

Figure 2b. Registration In Progress Notification

1.3.1.3 Registration confirmation email
- An email will be sent to your registration email address (Figure 2c)
- Click on the “CONFIRM REGISTRATION” link within this email. This action is to confirm and process your registration

Figure 2c. Registration Confirmation Email

1.3.1.4 Choosing a Password
- Enter your chosen password* (Figure 2d)
- Confirm your chosen password then click the "Submit" button

*Passwords must be at least 8 characters in length and contain at least ONE CAPITAL LETTER and ONE SPECIAL CHARACTER i.e. ! or * or $

Figure 2d. Setting a password
1.3.1.5 NORS Terms and Conditions

- Please read the Disclaimer/ Terms and Conditions for NORS (Figure 3)
- The disclaimer can be downloaded from the “Downloadable Files” section of the NORS homepage
- If you agree to all terms & conditions tick the box “I agree to comply with all terms and conditions listed above” and click the “Confirm” button to complete your registration

Upon completion of your registration (and your use of NORS) implies you have read and agree with this disclaimer

1.3.1.6 Registering at an OPAT service

- Users are required to register at their OPAT Service (Figure 4)
- Select your OPAT Service from the drop down menu under “Choose Service”; then click the “Choose” button (Figure 4)
- If your OPAT service is not listed go to “New Service”, enter the name of your OPAT service then click the “Choose” button (Figure 4)

Figure 4. Registering at an OPAT Service

1.3.1.7 Registering details for your OPAT service

Please ensure all details for your OPAT service are complete and correct (Figure 5).

Please complete all details for your OPAT service, using the drop down menus where relevant (Figure 5).

As a user you will need to register at your OPAT service within the system as follows:

- Select the name of your Host Organisation from the drop down list
- If your Host Organisation is not listed you will need to add this by clicking the “Add New Host Organisation” link. Your Host Organisation is the OPAT service to which your OPAT service belongs i.e. Everyday Healthcare NHS Trust
- If your Host Organisation operates more than one OPAT service, each Service must register separately i.e. Everyday Host Organisation = Everyday Healthcare NHS Trust, OPAT service 1 name = Everyday Hospital A, OPAT service 2 name = Everyday Hospital B
Individual services must register and log information separately, as each service enters data under its own name.

- Enter all contact details for your service (address, postcode etc.)
- “Region” (England, Northern Ireland, Republic of Ireland, Scotland or Wales)
- “Service Type” is the type of OPAT service you operate (Primary care, Hospital site or Ambulatory care). This is to distinguish between different OPAT services within a host organisation.
- For “Are you an Adult or Paediatric service” select either the “Adult” or the “Paediatric” option, as relevant. For adult options select either “Teaching” or “Specialist”. A specialist service is regarded as an Acute Coronary Care service, an Orthopaedic service for example.
- For “When do you want to start submitting quarterly data?” select the year and quarter from which you wish to begin entering data. NOTE. Once set no retrospective data earlier than this date can be entered.
- NORS assumes data will be entered from (and including) the quarter and year chosen, and then all subsequent years and quarters thereafter. In other words, by selecting Q2 2016 the system assumes you wish to enter data from April 2016 (and any quarter and year thereafter). In this case you will not be able to enter data prior to the April 2016.
- For all incomplete or overdue data entered a system reminder will be sent via email, and on a monthly basis, to the OPAT service lead (see section 1.3.1.8).
- For “Whole Time Equivalent of OPAT Team Members” this is the number of paid hours based on WTE for each OPAT team member (see example below).

Team members comprise:

- Medical Consultant
- Medical Trainee
- Pharmacist
- Nurse
- Administrator

- Click the “Save” button to save all service details entered
- From here you will be taken to your service dashboard (see section 1.5, Figure 8).

**Example Whole Time Equivalent of OPAT Team Members:**

- one nurse working 37.5 hours per week = 1 WTE [Based on 1WTE as 5 days per week in their job plan]
- one pharmacist working 2 hours per week (2/37.5 = 0.053) = 0.053 WTE [Based on 1WTE as 5 days per week in their job plan]
- one consultant working 3 hours per week (3/10 = 0.3) = 0.3 WTE [Based on 1WTE as 10 PA in their job plan].

**1.3.1.8 The OPAT Service lead**

NORS considers the first user to register at a service is the OPAT “Lead” for that service. The OPAT service lead can be changed at any time by contacting the BSAC at: OPAT@bsac.org.uk.
1.4 Logging into NORS

You will not be able to log into NORS unless you have registered as a user (see section 1.3.1).

- NORS can be accessed at: opatreregistry.com
- Enter your email address and password (Figure 6)
- Click the “ENTER” button (Figure 6)

1.4.1 Forgotten Password

You can change recover or change your password at any time.

- Click the “Forgot Password?” link (Figure 7)
- An email will be sent to the email address you used when registering to use NORS
- Follow instructions within the email to reset your password
- If you wish to change your registration details please email OPAT@bsac.org.uk

Figure 6. Logging into NORS

Figure 7. Forgotten Password
1.5 Your OPAT service dashboard / Data summary page

Once you have confirmed data entry for your OPAT service this is aggregated and displayed on your OPAT service dashboard (Figure 8).

This dashboard shows a summary of all completed data entry by your service.

NORS automatically aggregates all confirmed data and all data is anonymous and does not contain patient identifiable information.

The service dashboard shows summarised data* (Figure 8) by current year & overall data (all data entered to date) by:

- Total number of patient episodes
- Total number of treatment days saved
- Mean Length of Treatment
- Total number of adverse reactions (line & drug)
- OPAT Outcomes based on the total number of patient episodes determined as:
  - OPAT success
  - OPAT partial success
  - OPAT failure
  - OPAT indeterminate success
- Graphic representation of the Top 5 data sets entered for your Service (Figure 8) as:
  - Primary Infective Diagnosis (PIDs) by patient episode
  - Mean Length of Treatment
  - Antimicrobial agents (drugs) used
  - Adverse reactions (line & drug)

*See Appendix for a full list of all PIDs, antimicrobial agents, adverse reactions and OPAT outcome descriptions.
1.6 Entering data into NORS

**Only data for patients who have been discharged from your OPAT service should be entered into NORS.**

- Data can be entered into NORS at any time
- Data entry is manual and based on specific data entry fields (see section 1.2.1 & Appendix)
- Data is entered by quarter and year, based on calendar year:
  - Q1 – January, February & March
  - Q2 – April, May & June
  - Q3 – July, August & September
  - Q4 – October, November & December

1.6.1 Where to add data to NORS

Data is entered via the “+ADD NEW QUARTERLY DATA” section using the menu to the left hand side of the page (Figure 9)

Select the quarter for which you wish to enter data by clicking the “Add” button to the right hand side of the relevant quarter (Figure 9)

1.6.2 Entering quarterly service summary information

- Enter combined quarterly data for:
  - Total number of patient episodes
  - Total number of treatment days saved
  - Total number of adverse line events (reactions)
  - Total number of adverse drug events (reactions)
- Whole Time Equivalent of OPAT Team Members (the number of paid hours based on WTE for each OPAT team member):
  - Medical Consultant
  - Medical Trainee
  - Pharmacist
  - Nurse
  - Administrator

**Figure 9. Where to add data to NORS**

[Quarterly Data Entry Table]

<table>
<thead>
<tr>
<th>Quarter Start Date</th>
<th>Year</th>
<th>Quarter</th>
<th>Summary Section Status</th>
<th>Ptd Section Status</th>
<th>Adr Section Status</th>
<th>Axr Section Status</th>
<th>Add</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/01/2018</td>
<td>2018</td>
<td>Q1</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Add</td>
</tr>
<tr>
<td>01/01/2018</td>
<td>2018</td>
<td>Q2</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Add</td>
</tr>
<tr>
<td>01/01/2018</td>
<td>2018</td>
<td>Q3</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Add</td>
</tr>
<tr>
<td>01/01/2018</td>
<td>2018</td>
<td>Q4</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Not Started</td>
<td>Add</td>
</tr>
</tbody>
</table>

[ESAC TEST 27 NOVEMBER 2017]
• Check all data entry is correct before clicking the “Create” button to add these details to your service (Figure 9a)
• Click the “Cancel” button if you do not wish to make any changes/edits to the service summary details (Figure 9a)

### 1.6.3 Checking quarterly service summary information

Check all summary data is entered correctly

Click the “Edit” button if you wish to make any corrections (Figure 9b) then click the “Create” button to save the changes (Figure 9a).

Figure 9a. Entering quarterly summary information

Figure 9b. Editing quarterly summary information
If all summary data is entered correctly click the “Continue” button (Figure 9c).

1.6.4 Entering quarterly collated information

Three sets of data are required for data entry (Figure 9d):
  - Quarterly information by primary infective diagnosis
  - Quarterly information by antimicrobial agent
  - Quarterly information by adverse reaction

Click on the pink “Help” button (Figure 9d) to view detailed instructions / hints on how to enter information in these sections.
1.6.4.1 Entering quarterly information by PID

Refer to Figures 9d & e.

See the Appendix for a full list of PIDs and OPAT Outcome descriptions.

Click on the pink “Help” button at the top of the data entry page to view detailed instructions / hints on how to enter information in this section (Figure 9d). This can be found in the section “Entering Primary Infective Diagnosis (PID) information”.

- Click the “Primary Infective Diagnosis” link (Figure 9d)
- Click the “New” button to begin adding data (Figure 9e) then enter data line-by-line (row)
- Select the relevant PID by clicking in the box to the left hand side of the text, a “tick” will appear in the box to show this has been selected.
- Click the “Save” button to save each row of data entered.

*If you do not click the “Save” button all data added to a row will be removed. This function is in place to ensure all data is checked and correct per row.*

- Once all data entry is checked and completed for this section click the green “Complete Section” button (Figure 9e).

*NOTE. This action changes the data entry status from “Not Started” to “Completed”.*

If a PID is not listed please email: opat@bsac.org.uk

1.6.4.2 Entering quarterly information for drugs (antimicrobial agents)

Refer to Figures 9d & f.

See the Appendix for a full list of antimicrobial agents.

Click on the pink “Help” button at the top of the data entry page to view detailed instructions / hints on how to enter information into this section (Figure 9d). This can be found in the section “Entering Antimicrobial information”.

When adding antimicrobial data the total number of antimicrobial treatment days can be greater than the total number of patient episodes. If a patient is on more than one antimicrobial agent this should be recorded. Up to three antimicrobial agents can be selected while a patient is on OPAT (IV+PO therapy) e.g. 2 IV & 1 oral anti-infective. Oral agents should only be recorded when these are used as part of IV therapy.

- Click the “Antimicrobial” link (Figure 9d)
- Click the “New” button to begin adding data (Figure 9f) then enter data line-by-line (row)
- Select the relevant antimicrobial agent by clicking in the box to the left hand side of the text, a “tick” will appear in the box to show this has been selected
- Click the “Save” button to save each row of data entered.

*If you do not click the “Save” button all data added to a row will be removed. This function is in place to ensure all data is checked and correct per row.*
Once all data entry is checked and completed for this section click the green "Complete Section" button (Figure 9f).

**NOTE. This action changes the data entry status from “Not Started” to “Completed”.

If an antimicrobial agent is not listed please email: opat@bsac.org.uk

1.6.4.3 Entering quarterly information for adverse reactions

Refer to Figures 9d & g.

See the Appendix for a full list of adverse reactions (line and drug).

Click on the pink “Help” button (Figure 9d) at the top of the data entry page to view detailed instructions / hints on how to enter information into this section. This can be found in the section “Entering Adverse Reactions (by line or drug type)”.

- Click the “Adverse Reactions” link (Figure 9d)
- Click the “New” button to begin adding data (Figure 9g) then enter data line-by-line (row)
- Select the relevant adverse reaction by clicking in the box to the left hand side of the text, a “tick” will appear in the box to show this has been selected
- Click the “Save” button to save each row of data entered.

*If you do not click the “Save” button all data added to a row will be removed. This function is in place to ensure all data is checked and correct per row*

- Once all data entry is checked and completed for this section click the green “Complete Section” button (Figure 9g).

**NOTE. This action changes the data entry status from “Not Started” to “Completed”.

If an adverse reaction is not listed please email: opat@bsac.org.uk

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Figure 9f. Entering quarterly information by drug (antimicrobial agent)

Figure 9g. Entering quarterly information by adverse reactions
1.6.4.4  Editing or deleting quarterly data

**IMPORTANT NOTE.** You are advised to review and check all data entered is correct before clicking the RED “Confirm” button (Figure 9i).

Clicking the RED “Confirm” button submits your data to NORS. THIS ACTION CANNOT BE UNDONE.

Before confirming data entry it is possible to edit or delete quarterly data entered (for detailed instructions click on the pink “Help” button, refer to Figure 9d).

Editing data can be done in any of the data sections i.e. PID, antimicrobial agents or adverse reactions as follows:

- Click the link relating to the section you wish to make changes i.e. “Primary Infective Diagnosis”, “Antimicrobial” or “Adverse Reactions” link
- Click the green “Undo Complete” button (Figure 9h)
- This changes the data entry status from completed to “In Progress”
- Make any necessary changes, saving each line as you progress
- Once all edits / corrections are made click the green “Complete Section” button (see Figure 9g)

![Figure 9h. Editing data](image)

1.6.4.5  Confirming data entry

Click on the pink “Help” button at the top of the data entry page to view detailed instructions / hints on how to enter information into this section (Figure 9d). This can be found in the section “Confirming Data Entry”.

**IMPORTANT NOTE.** You are advised to review and check all data entered is correct before clicking the RED “Confirm” button (Figure 9i)

Clicking this RED “Confirm” button submits your data to NORS. THIS ACTION CANNOT BE UNDONE*.

All confirmed data will appear on your service dashboard and the NORS national dashboard (Figure 8). Data will also appear in the reporting sections for your service.

*Only OPAT Infection Outcome data can be amended after 6 months has lapsed (see section 2.3).

![Figure 9i. Confirming data entry](image)
2. NORS DATA REPORTS

2.1 Introduction to NORS reports

NORS offers a flexible reporting tool allowing users to:

- build bespoke reports by selecting specific data fields in a grid format
- easily download reports into Microsoft® Excel
- analyse OPAT Service data

NORS provides three standard report types:

1. Primary Infective Diagnosis (PID)
   - Region/Service Type/Treatment days saved/Patient episodes/Mean Length of Treatment

2. Adverse Reactions (ADR)
   - Region/Service Type/Reaction type/Reaction

3. Drug (Antimicrobials)
   - Region/Service Type/Antimicrobial agent
   - Up to 3 agents can be chosen (IV & PO) i.e. two IV & one oral agent

Standard reports can be accessed via the “Reports” section by clicking the “Reports” link (Figure 10a).

2.2 Building reports

To build a report click the “REPORTS” link (Figure 10a). A drop down menu will appear offering three standard types of report as (outlined in section 2.1 above). Click on the report type you wish to build i.e. PID, ADR or Drug (Figure 10a). Report data is displayed in table format (Figure 10a).

Additional data can be included into standard reports by either using filter icons or by selecting data fields using the pink “Toggle Fields” button (Figure 10a).

Once built, a report this can be exported into Excel for analysis.

Figure 10a. Building reports
2.2.1 Building a primary infective diagnosis (PID) report

The standard PID report can be found in the “Reports” section (Figure 10a).

Standard PID reports include the following data* (Figure 10b):

1. Region (England, Scotland, Wales, Northern Ireland & The Republic of Ireland), Service type (Ambulatory care, Primary care, Hospital site), and Host organisation (OPAT Service name)

2. Number of treatment days saved, Number of patient episodes, Mean Length of Treatment (all by year and quarter)

3. An alphabetical list of PIDs

*Data can be filtered using filter icons associated with each set of information i.e. by region, or service type, or service name, or PID and so on.

It may not be necessary to use all filters i.e. when using the “Host Organisation” filter to choose particular services, it is not necessary to use the “Region” or “Service Type” filters.

A full list of PIDs can be found in the Appendix.

Figure 10b. Building a PID report
2.2.1.1 Building a PID report using filters

Data shown is for all Services, including your own.

If you wish to build a report to only include your own Service data with data for one or more specific Services, click the filter icon next to “Service” (Figure 10c). Deselect the box next to “(Show All)”, then click in the box next to the name of the relevant Service(s) to be included in your report (Figure 10c).

The “Host Organisation”, “Region” and “Service Type” filters can also be used to choose specific data.

Once you have selected the services to be included in your PID report click the “OK” button to save the changes, these will appear in the table (Figure 10c).

Your data/report can be exported into Excel for analysis by clicking the “Export to Excel” button at the top of the page.

![Figure 10c. Building a PID report (using the “Service” filter)](image)

Similarly you can select specific PIDs for your report by clicking on the filter icon next to the PID button (Figure 10d). A window will open with an A-Z list of all PIDs, click in the box next to “Show All” to deselect all PIDs (Figure 10d), then tick the box next to the name of the relevant PID(s) you wish to include in your report (Figure 10d).

Once you have selected the Services and PIDs to be included in your report click the “OK” button to save the changes, these will then appear in the table (Figure 10d).

![Figure 10d. Building a PID report (using the “PID” filter)](image)

Your data/report can be exported into Excel for analysis by clicking the “Export to Excel” button at the top of the page.

Primary Infective Diagnosis
2.2.1.2 Building a PID report by year and quarter

Using the filter icons adjacent to the “Year” and “Quarter” buttons allows selected reports to be built by year and quarter (Figure 10d).

A window will open with a list of years and quarters in date order, click in the box next to the relevant year(s) and quarter(s) to be included in your report.

Click the “OK” button to save all selected data to your report (Figure 10d).

2.2.1.3 Building a PID report using Toggle Fields

Additional data can be included in the PID report using the “Toggle Fields” button at the top of the reports page (Figure 10a).

A window will open with a “PivotGrid Field List” and containing a list of “Hidden Fields” (Figure 10e).

**Primary Infective Diagnosis**

![Figure 10e. The “PivotGrid Field List” for PID reports](image)

Fields can be incorporated into the PID report by dragging and dropping individual fields into the table as required, for example OPAT and Infection outcomes, organisation type etc. (Figure 10f).
2.2.1.4 Example PID report

This example shows how to include OPAT Outcome data into a PID report.

In the “PivotGrid Field List” section click on the field “OPAT SUCCESS Count”, drag the field into the green highlighted area at the top of the table; and next to the “Episodes Count” field (Figure 10f). Dropping the field here will place the “OPAT SUCCESS Count” field into the table alongside the Total Treatment Days Saved and Episodes Count fields (Figure 10f).

Repeating this action for all other OPAT Outcomes fields i.e. “OPAT PARTIAL SUCCESS”, “OPAT INDETERMINATE” & “OPAT FAILURE Count” fields will place the data into the table/report (Figure 10f).

Once all OPAT Outcomes are included in the table these appear in the green highlighted area as a “Data Headers” field (Figure 10g). All data will appear in the table alongside the pre-populated data of treatment days saved and episodes count (Figure 10g).

By following these steps you can build other fields into the table (from the “Hidden Fields” in the “PivotGrid Field List” i.e. organisation type, quarter and region data etc).

In the same way fields can be removed from reports by dragging these from the report window back into the Hidden Fields list.

When all required data is built into the table/report this can be downloaded into an Excel file by clicking the blue “Export to Excel” button in the top right hand section of the page (Figure 10g).

To remove all filters click in the “Reports” section to begin a new report. Selected fields are removed each time a new report is run.
2.2.1.5 Exporting a PID report

Once the desired report is built, all information can be exported into an Excel spreadsheet for further data manipulation.

Click the blue “Export to Excel” button at the top of the reporting page (Figure 10g).

2.2.2 Building an adverse reactions (ADR) report

The standard Adverse Reactions report can be found in the “Reports” section (Figure 10a).

Standard ADR reports include the following data* (Figure 10h):

1. Region (England, Scotland, Wales, Northern Ireland & The Republic of Ireland), Service type (Ambulatory care, Primary care, Hospital site), and Host organisation (OPAT Service name)
2. Total Event Count by year and quarter
3. Reaction Type (Drug or Line)
4. Reaction (Rash, Diarrhoea, Allergy to dressing etc.)

*Data can be filtered using the filter icons associated with each set of information i.e. by region, service type, service name, adverse reaction, and so on (Figure 10h).

A full list of Adverse Reactions can be found in the Appendix.

Adverse Reactions

Figure 10h. Building an adverse reactions (ADR) report
2.2.2.1 Building adverse reactions (ADR) report using filters

Data shown is for all Services, including your own.

If you wish to build a report to only include your own Service data with data for one or more specific Services, click the filter icon next to “Service” (Figure 10i). Deselect the box next to “(Show All)”, then click in the box next to the name of the relevant Service(s) to be included in your report (Figure 10i).

The “Host Organisation”, “Region” and “Service Type” filters can also be used to choose specific data.

Once you have selected the services to be included in your ADR report click the “OK” button to save the changes, these will appear in the table.

**Adverse Reactions**

Similarly, you can select any, or all, ADRs by clicking on the filter icon next to the “Reaction” button (Figure 10j). A window will open with an A-Z list of all adverse reactions, click in the box next to “Show All” to deselect all reactions (Figure 10j), then tick the box next to the relevant reaction(s) you wish to include in your report (Figure 10j).

Once you have selected the reactions to be included in your report click the “OK” button to save the changes (Figure 10j), these will then appear in the table.

Your data/report can be exported into Excel for analysis by clicking the “Export to Excel” button at the top of the page.

**Adverse Reactions**
2.2.2.2 Building an ADR report by year and quarter

Using the filter icons adjacent to the “Year” and “Quarter” buttons allows selected reports to be built by year and quarter (Figure 10k). A window will open with a list of years and quarters in date order, click in the box next to the relevant year(s) and quarter(s) to be included in your report.

Click the “OK” button to save the data to your report.

2.2.2.3 Building an ADR report using Toggle Fields

Additional data can be included in the ADR report using the “Toggle Fields” button at the top of the reports page (Figure 10k).

A window will open with a “PivotGrid Field List” and containing a list of “Hidden Fields” (Figure 10k).

Fields can be incorporated into the ADR report by dragging and dropping individual fields into the table as required, for example “Quarter Events Average” (Figure 10l).

2.2.2.4 Example of an ADR report

This example shows how to include the field “Quarter Events Average” into an ADR report.

In the “PivotGrid Field List” section click on the field “Quarter Events Average”, drag the field into the green highlighted area at the top of the table; and next to the “Total Event Count” (Figure 10l). Dropping the field here will place the “Quarter Events Average” field into the table alongside the “Total Event Count” field (Figure 10l).

Repeating this action for any other ADR Hidden fields will place the data into the table/report (Figure 10l).

When all required data is built into the table/report this can be downloaded into an Excel file by clicking the blue “Export to Excel” button in the top right hand section of the page (Figure 10k).

To remove all filters click in the “Reports” section to begin a new report. Selected fields are removed each time a new report is run.
2.2.2.5 Exporting an ADR report

Once the desired report is built, all information can be exported into an Excel spreadsheet for further data manipulation.

Click the blue “Export to Excel” button at the top of the reporting page (Figure 10k).

2.2.3 Building a drug (antimicrobials) report

The standard drug (Antimicrobials) report can be found in the “Reports” section (Figure 10a).

Standard drug reports include the following data* (Figure 10m):

1. Region (England, Scotland, Wales, Northern Ireland & The Republic of Ireland), Service type (Ambulatory care, Primary care, Hospital site), and Host organisation (OPAT Service name)
2. Quarterly average of patient episodes, Number of treatment days saved, Number of patient episodes (by year and quarter)
3. An alphabetical list of antimicrobial agents

*Data can be filtered using the filter icons associated with each set of information i.e. by region, service type, service name, antimicrobial and so on.

A full list of antimicrobial agents can be found in the Appendix.

It may not be necessary to use all filters i.e. when using the “Host Organisation” filter to choose particular services, it is not necessary to use the “Region” or “Service Type” filters.
2.2.3.1 Building a drug report using filters

Data shown is for all Services, including your own.

If you wish to build a report to only include your own Service data with data for one or more specific Services, click the filter icon next to “Service” (Figure 10n). Deselect the box next to “(Show All)”, then click in the box next to the name of the relevant Service(s) to be included in your report (Figure 10n).

The “Host Organisation”, “Region” and “Service Type” filters can also be used to choose specific data.

Once you have selected the services to be included in your drug report click the “OK” button to save the changes, these will appear in the table.

Similarly, you can select any, or all, drugs by clicking on the filter icon next to the “Antimicrobial” button (Figure 10o). A window will open with an A-Z list of all drugs/antimicrobial agents, click in the box next to “Show All” to deselect all drugs (Figure 10o), then tick the box next to the relevant drug(s) you wish to include in your report (Figure 10o).

Once you have selected the drugs to be included in your report click the “OK” button to save the changes, these will then appear in the table.

Your data/report can be exported into Excel for analysis by clicking the “Export to Excel” button at the top of the page.

Figure 10m. Building a drug (Antimicrobials) report

Figure 10n. Building a drug report (using the “Service” filter)
2.2.3.2 Building a drug report by year and quarter

Using the filter icons adjacent to the “Year” and “Quarter” buttons allows selected reports to be built by year and quarter (Figure 10p).

A window will open with a list of years and quarters in date order, click in the box next to the relevant year(s) and quarter(s) to be included in your report. Click the “OK” button to save the data to your report.

2.2.3.3 Building a drug report using Toggle Fields

Additional data can be included in the drug report using the “Toggle Fields” button at the top of the reports page (Figure 10m). A window will open with a “PivotGrid Field List” and containing a list of “Hidden Fields” (Figure 10p).
Fields can be incorporated into the antimicrobial report by dragging and dropping individual fields into the table as required, for example “ServiceType Treatment Days Saved Average” (Figure 10p).

2.2.3.4 Example drug report
This example shows how to include the field “Service Type Treatment Days Saved Average” into the antimicrobial report (Figure 10q).

Click on the field “ServiceType Treatment Days Saved Average”, drag the field into the green highlighted area at the top of the table; and next to the “Data Headers” field (Figure 10p).

Dropping the field into this area will place the “Service Type Treatment Days Saved Average” field into the table (Figure 10q).

Repeating this action for any other Hidden fields will place the data into the table/report.

When all required data is built into the table/report this can be downloaded into an Excel file by clicking the blue “Export to Excel” button in the top right hand section of the page (Figure 10m).

To remove all filters click in the “Reports” section to begin a new report. Selected fields are removed each time a new report is run.

Antimicrobials

![Antimicrobials Table]

Figure 10q. Example drug report

2.2.3.5 Exporting a drug report
Once the desired report is built, all information can be exported into an Excel spreadsheet for further manipulation. Click the blue “Export to Excel” button at the top of the page (Figure 10m).
2.3 Record of 6-month infection outcomes

2.3.1 Reviewing and editing 6-month infection outcomes data

Infection outcomes can be reviewed 6 months after data has been entered into NORS. This provides OPAT Services the opportunity to review this data but only 6 months after a quarter has passed (Figure 11a).

NORS users will receive an email notification after 6 months has lapsed and users can make any necessary changes to the OPAT Infection Outcomes data.

To review and/or edit Infection outcome data click the pink “Edit/Review” button associated with the relevant quarter under review (Figure 11a).

![Figure 11a. Record of 6-month infection outcomes](image)

Click the “Edit” button to make any edits to Infection Outcomes by PID (Figure 11b).

![Figure 11b. Editing infection outcomes data after 6 months](image)
Once the record of 6-month infection outcomes is updated click the “Complete Section” button to save the data (Figure 11c).

![Primary Infective Diagnosis InProgress](image)

Figure 11c. Completing edits to 6-month infection outcomes

Click the RED “Confirm” button to save the data or the “Edit/Review” button if you wish to make any further changes to the 6-month infection outcome data (Figure 11d).

**NOTE:** Clicking the RED “Confirm” button submits this data to NORS. THIS ACTION CANNOT BE UNDONE.

![Quarterly Data Entry - 6 month outcomes](image)

Figure 11d. Completing edits to 6-month infection outcomes
### 3. APPENDIX (Data entry fields & lists of information)

#### 3.1 General Information

<table>
<thead>
<tr>
<th>Quarter Summary Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of Patient Episodes for the quarter</td>
</tr>
<tr>
<td>Total number of Treatment Days Saved for the quarter</td>
</tr>
<tr>
<td>The total number of Line Events for the quarter</td>
</tr>
<tr>
<td>The total number of Drug Events for the quarter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Whole Time Equivalent (WTE) of OPAT Team Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Consultant WTE hours worked for the quarter</td>
</tr>
<tr>
<td>Medical Trainee WTE hours worked for the quarter</td>
</tr>
<tr>
<td>Pharmacist WTE hours worked for the quarter</td>
</tr>
<tr>
<td>Nurse WTE hours worked for the quarter</td>
</tr>
<tr>
<td>Administrator WTE hours worked for the quarter</td>
</tr>
</tbody>
</table>

#### 3.2 Fields for Primary Infective Diagnosis (PID)

<table>
<thead>
<tr>
<th>Fields for primary infective diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Infective Diagnosis (PID) i.e. Cellulitis, Endocarditis etc.</td>
</tr>
<tr>
<td>Total number of Patient Episodes for the quarter</td>
</tr>
<tr>
<td>Total number of Treatment Days Saved for the quarter</td>
</tr>
<tr>
<td>Total number of Infection Outcomes for the quarter by PID (Cured, Improved or Failed)</td>
</tr>
<tr>
<td>Total number of OPAT Outcomes for the quarter by PID (Success, Partial, Failed, Indeterminate)</td>
</tr>
</tbody>
</table>

#### 3.3 Fields for drugs (antimicrobial agents)

<table>
<thead>
<tr>
<th>Fields for drugs/antimicrobial agents*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug/Antimicrobial name</td>
</tr>
<tr>
<td>Total number of Patient Episodes for each drug</td>
</tr>
<tr>
<td>Total number of Antimicrobial Treatment Days for each drug</td>
</tr>
</tbody>
</table>

*Up to 3 combinations of different drug/antimicrobial agents (IV+ PO) can be chosen

#### 3.4 Fields for adverse reactions

<table>
<thead>
<tr>
<th>Fields for adverse reactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total for each Adverse Line Event for the quarter</td>
</tr>
<tr>
<td>Total for each Adverse Drug Event for the quarter</td>
</tr>
</tbody>
</table>
## 3.5 A-Z List of primary infective diagnoses (PIDs)

<table>
<thead>
<tr>
<th>PID</th>
<th>Adult and/or Paediatrics</th>
<th>PID</th>
<th>Adult and/or Paediatrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actinomycosis</td>
<td>Adult &amp; Paediatrics</td>
<td>Lymphadenitis</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Appendicitis</td>
<td>Adult &amp; Paediatrics</td>
<td>MAI (Non-tuberculous mycobacteria)</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Aspergillosis</td>
<td>Adult &amp; Paediatrics</td>
<td>Malignant otitis externa</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Bacteraemia / blood stream infection/ Septicaemia</td>
<td>Adult &amp; Paediatrics</td>
<td>Mastoiditis</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Bacterial meningitis</td>
<td>Adult &amp; Paediatrics</td>
<td>Neonatal HSV</td>
<td>Paediatrics only</td>
</tr>
<tr>
<td>Bronchiectasis</td>
<td>Adult &amp; Paediatrics</td>
<td>Nocardiosis</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Brucellosis</td>
<td>Adult &amp; Paediatrics</td>
<td>Orbital cellulitis</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Bursitis</td>
<td>Adult &amp; Paediatrics</td>
<td>Osteomyelitis-diabetic foot</td>
<td>Adult only</td>
</tr>
<tr>
<td>Candidiasis</td>
<td>Adult &amp; Paediatrics</td>
<td>Osteomyelitis-non surgical</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Carotid patch infection</td>
<td>Adult only</td>
<td>Osteomyelitis-surgically related</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Cellulitis</td>
<td>Adult &amp; Paediatrics</td>
<td>Otitis media</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Cerebral abscess</td>
<td>Adult &amp; Paediatrics</td>
<td>Pelvic abscess</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Cholangitis</td>
<td>Adult &amp; Paediatrics</td>
<td>Periorbital cellulitis</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Congenital CMV</td>
<td>Paediatrics only</td>
<td>Pneumonia - Community Acquired</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Congenital syphilis</td>
<td>Paediatrics only</td>
<td>Pneumonia - Hospital Acquired</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Cystic fibrosis- infective episode</td>
<td>Adult &amp; Paediatrics</td>
<td>Prosthetic joint - knee</td>
<td>Adult only</td>
</tr>
<tr>
<td>Cytomegalovirus</td>
<td>Adult &amp; Paediatrics</td>
<td>Prosthetic joint - other</td>
<td>Adult only</td>
</tr>
<tr>
<td>Diabetic foot infection (no osteomyelitis)</td>
<td>Adult only</td>
<td>Prosthetic joint- hip</td>
<td>Adult only</td>
</tr>
<tr>
<td>Discitis/vertebral osteomyelitis - metalwork</td>
<td>Adult &amp; Paediatrics</td>
<td>Psoas abscess</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Discitis/vertebral osteomyelitis - no metalwork</td>
<td>Adult &amp; Paediatrics</td>
<td>Pyrexia of unknown origin</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Early onset sepsis</td>
<td>Paediatrics only</td>
<td>Respiratory tract infection -other</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Empyema</td>
<td>Adult &amp; Paediatrics</td>
<td>Salmonella</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Encephalitis</td>
<td>Adult &amp; Paediatrics</td>
<td>Scalded skin syndrome</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Endocarditis</td>
<td>Adult &amp; Paediatrics</td>
<td>Septic arthritis</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Epidural abscess</td>
<td>Adult &amp; Paediatrics</td>
<td>Sinusitis</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Fever in early infancy</td>
<td>Paediatrics only</td>
<td>Skin and soft tissue infection</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>Adult &amp; Paediatrics</td>
<td>Syphilis</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Hepatic abscess</td>
<td>Adult &amp; Paediatrics</td>
<td>Syphilis (Neuro)</td>
<td>Adult only</td>
</tr>
<tr>
<td>Infected cranioplasty</td>
<td>Adult &amp; Paediatrics</td>
<td>Tonsillitis</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Infected Intracerebral stimulators</td>
<td>Adult &amp; Paediatrics</td>
<td>Toxic shock syndrome</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Infected pacing box</td>
<td>Adult &amp; Paediatrics</td>
<td>Tuberculosis</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Intraabdominal abscess</td>
<td>Adult &amp; Paediatrics</td>
<td>Urinary tract infection</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Late onset sepsis</td>
<td>Paediatrics only</td>
<td>Vascular graft infection</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Line related infection - systemic</td>
<td>Adult &amp; Paediatrics</td>
<td>Viral infection</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Lyme</td>
<td>Adult &amp; Paediatrics</td>
<td>VP Shunt Infection</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Lyme (Neuro)</td>
<td>Adult &amp; Paediatrics</td>
<td>Wound Infection-post surgical</td>
<td>Adult &amp; Paediatrics</td>
</tr>
<tr>
<td>Lymph node abscess</td>
<td>Adult &amp; Paediatrics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### A-Z List of drugs (antimicrobial agents)

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Drug Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aciclovir</td>
<td>Fusidic Acid</td>
</tr>
<tr>
<td>Amikacin</td>
<td>Ganciclovir</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>Gentamicin</td>
</tr>
<tr>
<td>Amphotericin</td>
<td>Imipenem</td>
</tr>
<tr>
<td>Anidulafungin</td>
<td>Isoniazid</td>
</tr>
<tr>
<td>Aztreonam</td>
<td>Levofloxacin</td>
</tr>
<tr>
<td>Benzylpenicillin</td>
<td>Linezolid</td>
</tr>
<tr>
<td>Capreomycin</td>
<td>Meropenem</td>
</tr>
<tr>
<td>Caspofungin</td>
<td>Metronidazole</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>Micafungin</td>
</tr>
<tr>
<td>Ceftolozane/Tazobactum</td>
<td>Moxifloxacin</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>Mupirocin</td>
</tr>
<tr>
<td>Cefuroxime</td>
<td>Ofloxacin</td>
</tr>
<tr>
<td>Cidofovir</td>
<td>Piperacillin/Tazobactam</td>
</tr>
<tr>
<td>Ciproprofloxacin</td>
<td>Pivmecillinam</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>Posaconazole</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>Procaine penicillin</td>
</tr>
<tr>
<td>Co-amoxiclav</td>
<td>Prothionamide</td>
</tr>
<tr>
<td>Colistin</td>
<td>Rifabutin</td>
</tr>
<tr>
<td>Cotrimoxazole</td>
<td>Rifampicin</td>
</tr>
<tr>
<td>Cycloserine</td>
<td>Sodium stibogloconate</td>
</tr>
<tr>
<td>Dalbavancin</td>
<td>Streptomycin</td>
</tr>
<tr>
<td>Daptomycin</td>
<td>Teicoplanin</td>
</tr>
<tr>
<td>Doripenem</td>
<td>Telavancin</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>Temocillin</td>
</tr>
<tr>
<td>Ertapenem</td>
<td>Tetracycline</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>Tigcycline</td>
</tr>
<tr>
<td>Ethambutol</td>
<td>Tobramycin</td>
</tr>
<tr>
<td>Flucloxacillin</td>
<td>Trimethoprim</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>Vancomycin</td>
</tr>
<tr>
<td>Flucytosine</td>
<td>Voriconazole</td>
</tr>
<tr>
<td>Fosfomycin</td>
<td></td>
</tr>
</tbody>
</table>
### 3.7 List of adverse reactions

<table>
<thead>
<tr>
<th>Adverse Reactions</th>
<th>Drug Related Adverse Reactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergy to dressing</td>
<td>Blood dyscrasia</td>
</tr>
<tr>
<td>Infections</td>
<td>C. diff</td>
</tr>
<tr>
<td>Line migration</td>
<td>Diarrhoea (antibiotic induced)</td>
</tr>
<tr>
<td>Line occlusion</td>
<td>Hepatitis</td>
</tr>
<tr>
<td>Other</td>
<td>Other</td>
</tr>
<tr>
<td>Thrombus</td>
<td>Rash</td>
</tr>
</tbody>
</table>

### 3.8 Definitions of OPAT Outcomes

#### Infection outcomes

| Cure | Completed OPAT therapy +/- oral step down for defined duration with resolution of infection and no requirement for long term antibiotic therapy (usually relates to less severe infections e.g. SSTI, UTI unless prosthetic material removed) |
| Improved | i. Completed OPAT therapy +/- oral step down with partial resolution of infection but need for further follow up OR  
ii. Completed OPAT therapy but required escalation of antimicrobial therapy during OPAT (without admission) +/- oral step down with ultimate cure or partial improvement (as above) e.g. Osteomyelitis, any infections where prosthetic material has not been removed |
| Failure | Progression or non-response of infection despite OPAT, required admission, surgical intervention or died for any reason |

#### OPAT outcomes

| Success | Completed therapy in OPAT with no change in antimicrobial agent, no adverse events, cure or improvement of infection and no readmission |
| Partial Success | Completed therapy in OPAT with either change in antimicrobial agent or adverse event not requiring admission |
| Failure of OPAT | Readmitted due to infection worsening or due to adverse event. Death due to any cause during OPAT |
| Indeterminate | Readmission due to unrelated event e.g. chest pain |
For enquiries or help in using the NORS system please contact Neil Watson at: nwatson@bsac.org.uk.
(This includes user difficulty, system or technical problems, general system issues)

For OPAT related issues, information & enquiries please contact the BSAC at: OPAT@bsac.org.uk