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Approved Costing Guidance – Standards

Ambulance information requirements and costing processes

Version 1 March 2022

Contents

What you need to implement these standards

We have brought these ambulance information requirements and costing processes together in one volume for easy reference as they all need to be implemented by all ambulance trusts.

Information requirements

Before you implement the *information requirements* in this document, you should read and understand:

- Costing principle - Materiality
  - You should ensure that you bring in the feeds which cover the largest service areas first.
- Technical document:
  - Spreadsheet IR1.1: Information feeds required for costing
  - Spreadsheet IR1.2: Field requirements for the information feeds
  - Spreadsheet IR1.3: Examples of feed data for different scenarios
  - Spreadsheet IR1.4: Diagram: different levels of information recorded for ambulance responses and their relationships.

Costing processes

Before you implement the *costing processes* in this document, you should read and understand:

- Technical document:
  - Spreadsheet CP3.1: Resources for patient-facing costs
  - Spreadsheet CP3.2: Activities for patient-facing costs
  - Spreadsheet CP3.3: Allocation methods to allocate patient-facing resources, first to activities then to incidents and finally to patients.

IR1: Collecting information for costing

Purpose: To set out the information requirements for incident-level and patient-level costing.

Objectives

1. To ensure all providers collect the same information for costing, comparison with peers and cost collection purposes.

2. To help allocate the correct quantum of cost to the correct activity using the prescribed cost allocation method.

3. To support accurate matching of costed activities to the correct incident and patient.

4. To support local reporting of cost information by activity in the organisation's dashboards and business intelligence.

Scope

5. This standard specifies the requirement for the information feeds for the costing process prescribed in the *Approved Costing Guidance – ambulance*.

6. The information requirements specified in this standard apply to all activity going through 999 control centres.

7. Where the identity of the patient is not known, activity information is required to cost **a** patient, not **the** patient.

8. Data on clinical interventions falls outside the scope of this standard because there are more appropriate drivers for ambulance service costs, such as journey time.

Overview

9. The standards describe three main information sources for costing:
   - activity information feeds
   - supplementary information feeds
   - relative weight values.

10. Any costs that cannot be allocated using the information in the prescribed information feeds need relative weight values (RWVs) or a local information source to be allocated.

11. You may be using extra sources of information for costing. If so, continue to use these and document them in your integrated costing assurance log (ICAL) worksheet 2: Additional information sources.

12. The information feeds provide the following information:
   - activities that have occurred, eg the incident feed contains information on providing telephone clinical advice, which tells the costing system whether to include this activity in the costing process; providing telephone clinical advice does not happen in all incidents
   - the cost driver to use to allocate costs, eg duration of time on scene
   - information for more accurate identification of resources, eg the fleet information feed contains information that can be used to identify the cost of repair and maintenance for an individual vehicle.

13. Spreadsheet IR1.1 lists the information feeds required for costing.

14. The standards prescribe two types of information feed:
   - **activity feeds**: these contain information about the patient-facing activities, eg the incident information feed
   - **supplementary feeds**: these contain information to calculate costs for resources more accurately, eg fleet information feed.

15. Activity feeds can be grouped into two types to support the matching process:
   - **master feeds**: the core patient-level activity feeds that the other feeds are matched to, eg the incident information feed

- **auxiliary feeds**: the information feeds that are matched to the master feeds, eg the response feeds.

16. Table IR1.1 lists the five information feeds we specify for ambulance costing. Note The feed numbers are set across all sectors, which explains why those for ambulance costing do not start at 1.

Table IR1.1: Information feeds

Feed number	Feed name	Feed scope	Type of feed
20	Incident information	All incidents your organisation responded to within the costing period. Call stage activity information is covered by this feed.	Master
21	Response information	All physical responses, ie staffed vehicles or on foot responders, that your organisation dispatched to respond to an incident within the costing period.	Auxiliary
22	Patient information	All patients who were involved in the incidents within the costing period. It is used to take incident level costs to the patient level.	Auxiliary*
23	Staff information	All staff shifts and working hours within the costing period.	Supplementary
24	Fleet information	All episodes of vehicle maintenance and repair for all vehicles involved in responding to incidents within the costing period.	Supplementary

* Note: The patient information is currently categorised as an auxiliary feed as there is activity information recorded in this feed.

17. Spreadsheet IR1.2 lists the data fields required for each feed.

18. You are not required to collect an activity feed if your organisation does not provide that activity.

19. You are not required to collect duplicate information across information feeds unless this is needed for matching. The reasons for including each field in the information feeds are given in columns J to M in Spreadsheet IR1.2.

20. Your informatics department is best placed to obtain the data required. To help you identify the information already being collected by your organisation, use Spreadsheet IR1.2.

21. This standard prescribes the information to be collected, but not how it is collected. If you collect several of the specified feeds from one dataset, you should continue to do so, provided the required information is captured.

22. If you have activity in your information feeds where the costs are reported in another provider's accounts, you need to report this activity under 'cost and activity reconciliation items' as described in Table CP5.1 in Ambulance standard CP5: Reconciliation. This is so your own patient costs are not allocated to this activity, deflating the cost of your own patients.

23. Note that the information feeds specified in this standard are neither output that you need to produce from your costing system nor the PLICS data specifications. They specify the input information you will need for costing.

Approach

24. This section describes each information feed, explaining:
    - relevant costing standard
    - data collection source
    - feed scope.

25. The diagram in Spreadsheet IR1.4 explains the different levels of information, particularly call level, response level, incident level and patient level, in relation to the information feeds.

26. You should read the following sections describing these feeds in conjunction with Spreadsheet IR1.2.

Feed 20: Incident information

Relevant costing standard

- Ambulance standard CM31: Allocating costs across job cycle elements
- Spreadsheet IR1.2: Field requirements for the information feeds

- Spreadsheet IR1.3: Examples of feed data for different scenarios, including Feed 20: Incident information, Feed 21: Response information) and Feed 22: Patient information link. Also included, the specific data fields that need to be populated for costing in each scenario.

Collection source

27. Activity data is collected from the call or another trigger (eg an ambulance passing a roadside incident or a transfer from NHS 111 service) and any subsequent responses recorded in your organisation's computer-aided dispatch (CAD) system.

28. This data should come from your CAD system.

Feed scope

29. All the incidents your organisation responded to within the costing period, covering every stage of an emergency response (ie job cycle) – from receiving a call to treating and conveying the patient(s) to a treatment location, handing over care and preparing to respond again.[1]

30. This feed includes information on:

    - call stage activities, eg source of call, start and end time of the call
    - incident-level physical response stage activities, eg number of responses dispatched for the incident, number of responses arriving on scene, number of responses arriving at treatment locations
    - general information about the incident, eg provider organisation, commissioning organisation, incident location and whether the location is cross-border.

31. Although data on call handling activities[2] is usually collected at the call level, which is lower than incident level – that is, one incident may be associated with more than one call, this version of the standards only requires information on the main call associated with the incident.[3] This is because duplicate calls

[1] See Ambulance standard CM31: Allocating costs across job cycle elements for details of job cycle stages.
[2] See Ambulance standard CM31: Allocating costs across job cycle elements for details of call stage activities.
[3] The main call is the call linked to the incident in your CAD system.

associated with the same incident cannot be linked to the main call and the incident.[4]

32. Data on telephone clinical advice activities[5] is usually collected at the incident level.

33. Data on giving telephone clinical advice to the crew at the scene is not required for this version of the standards.

34. Data on the physical response stage activities is usually collected at the response level. However, providers are required to collect an incident-level activity feed to bring together activity data from multiple responses for use in cost allocation, eg the number of responses allocated for the incident is used to allocate the cost of dispatchers.

35. This feed is a master activity feed that the auxiliary feeds match to.

Feed 21: Response information

Relevant costing standard

- Ambulance standard CM31: Allocating costs across job cycle elements
- Ambulance standard CM33: Non-responding time
- Spreadsheet IR1.2: Field requirements for the information feeds
- Spreadsheet IR1.3: Examples of feed data for different scenarios

Collection source

36. This data should come from your CAD system.

Feed scope

37. All responses – that is, staffed vehicles or on-foot responders – that your organisation dispatches to an incident within the costing period, covering all stages of a physical response from the time a response is dispatched, including travelling to the scene, treating patients at the scene and conveying

[4] This is based on feedback from the National Ambulance Information Group.
[5] See Ambulance standard CM31: Allocating costs across job cycle elements, for details of call stage activities.

the patient(s) to a treatment location, handing over care and preparing to respond again.

38. This feed includes information on:
    - time stamps and duration of the job cycles, eg at scene date and time; left scene date and time
    - the response unit, eg vehicle ID, vehicle type, staff ID
    - patient handover, eg handover organisation and department.

39. This auxiliary feed matches a response to an incident: it is matched to Feed 20: Incident information, using the activity ID (incident ID).

Feed 22: Patient information

Relevant costing standard

- Ambulance standard CP4: Matching costed activities to incidents and patients
- Spreadsheet IR1.2: Field requirements for the information feeds
- Spreadsheet IR1.3: Examples of feed data for different scenarios.

Collection source

40. This data may come from either your CAD system or your electronic patient record (EPR) system.

Feed scope

41. All patients who were involved in the incidents that your organisation responded to within the costing period.

42. This feed is used to take incident-level costs to the patient level.

43. This feed includes patient information collected during the emergency call and response:
    - patient identifying information, eg NHS number or other patient ID
    - demographic information, eg age, gender

- information relating to the emergency call, eg reasons for the call (also known as chief complaint)
- type of treatment the patient received:
  - hear and treat/refer
  - see and treat/refer
  - see, treat and convey.

44. We acknowledge that for some patients not all these details will be available. We expect available data to be recorded and an attempt made to find the NHS number using the electronic patient care record (ePCR), NHS Spine or other services. In Spreadsheet IR1.2 we provide the codes to use when data is not available.

45. Note that information governance issues should be covered by your organisation's own procedures, not these standards.

46. For multiple-patient incidents, the number of conveying vehicles arriving at a treatment location should be used as a proxy for the number of patients involved in the incident.[6] A patient record should be generated for each patient conveyed, even if the patient's details are not available – that is, a proxy patient record needs to be generated.

47. This feed is linked[7] to Feed 20: Incident information, using activity ID (incident ID) recorded in this feed, matching a patient to an incident.

48. It is also linked to Feed 21: Response information, using conveying response ID, which matches a patient to the response unit that conveys them.

Feed 23: Staff information

Relevant costing standard

- Ambulance standard CM31: Allocating costs across job cycle elements
- Ambulance standard CM33: Non-responding time

[6] See Ambulance standard CM31: Allocating costs across job cycle elements for details of how to allocate costs to multiple patients involved in an incident.
[7] It is linked rather than matched because matching only refers to matching of patient-facing activities.

Collection source

49. This data may come from the rota (scheduling) system and electronic staff record (ESR) system.

Feed scope

50. All staff shifts, working hours and downtime within shifts within the costing period.

51. The staff information feed is a supplementary feed, not an activity feed – that is, it contains no information about patient-facing activities. It is an information source to:
    - help allocate staff costs at the level of each individual staff member
    - calculate non-responding time for frontline staff.

52. Best practice is to use information from actual rotas and staff pay. This data can directly link staff costs to the activities the staff delivered and accurately distribute non-responding time across jobs.

53. This feed includes information on:
    - shift start and end date and time
    - staff identifier
    - staff working hours
    - start and end date and time of downtime
    - vehicle identifier.

54. This feed is linked[8] to Feed 20: Incident information, using staff ID for call-taking staff and clinicians who provide telephone clinical advice.

55. It is also linked to Feed 21: Response information, using staff ID for frontline staff.

[8] It is linked rather than matched because matching only refers to matching of patient-facing activities.

Feed 24: Fleet information

Relevant costing standard

- Ambulance standard CM32: Fleet costs
- Ambulance standard CM33: Non-responding time

Collection source

56. This data may come from your fleet management system. Where fleet management information is not available from a single system, gather information from the available source.[9] Please follow the guidance in Ambulance standard IR2: Managing information for costing to make the information available for costing.

Feed scope

57. All episodes of vehicle maintenance and repair for all vehicles involved in responding to incidents within the costing period.[10]

58. The fleet information feed is a supplementary feed, not an activity feed – that is, it contains no information about patient-facing activities. It is an information source to:
    - help allocate fleet costs at the level of each vehicle
    - calculate non-responding time for vehicles.

59. This feed includes information on the maintenance and running of vehicles in the fleet:
    - vehicle identifier
    - parts used in repairs and their costs
    - technician time
    - time vehicle spent off road (in hours).

[9] Feedback from the National Ambulance Information Group is that fleet management information is not available consistently across all ambulance service providers.
[10] See Ambulance standard CM32: Fleet costs for definitions of patient-facing vehicles and support vehicles.

60. Deep-cleaning dates and costs should be collected at the individual vehicle level, using a fleet number or other unique identifier.

61. This feed is linked to Feed 21: Response information, using vehicle ID.

Additional information feeds and fields

62. If you already collect information feeds in addition to the five specified above, please continue to do so. Record these additional feeds in ICAL worksheet 2: Additional information source.

63. If you collect data fields additional to those specified for local reporting or more detailed costing, continue to use these and log them in ICAL worksheet 2: Additional information source.

64. If your organisation has a well-developed EPR system, you may be able to capture more data on the care given to patients than the standards currently require. You should collect this additional data as it will increase local understanding of the costs associated with different activities, and future versions of the standards may require it for costing.

65. The groups of information listed above are the minimum the standards require for costing, but they do not cover all patient activities in ambulance services. You need to decide whether specific local costing needs require additional information feeds. Examples of such feeds are:

- patient transport service (PTS)
- NHS 111 service
- GP out-of-hours services
- commercial activities, such as first-aid training and events cover.

66. Use these three criteria to prioritise obtaining additional information feeds:

- value of service
- volume of service
- priority of the service within the provider and the healthcare economy.

Identifying hidden activity

67. Take care to identify any ‘hidden’ activity in your organisation. This is activity not recorded on any of your organisation’s main systems such as CAD.

68. Capturing ‘hidden’ activity is important to ensure that:

    - any costs incurred for it are not incorrectly allocated to the recorded activity, thus inflating its reported cost
    - costs incurred are allocated over all activity, not just activity reported on the provider’s main system such as CAD.

Other data considerations

69. Information from specific fields of the information feeds is required to enable cost to be allocated (see Spreadsheet CP3.3). These fields are flagged with a ‘Y’ in column J in Spreadsheet IR1.2.

70. The information feeds do not contain any income information. Your organisation may decide to include the income for the feeds at incident level.[11]

71. The feed specifications in Spreadsheets IR1.1 and IR1.2 do not include description fields for the codes used, eg organisation name for organisation code. You may need to ask for description fields to be included in the feeds; otherwise you need to maintain code and description look-up tables for each feed to understand the costing data supplied. There should be a process for mapping and a rolling programme for revalidating the codes and descriptions with each service.

[11] See Ambulance standard CM34: The income ledger for further information.

IR2: Managing information for costing

Purpose: To assess, manage and improve the availability and quality of the information specified in Ambulance standard IR1: Collecting information for costing.

Objectives

1. To explain how to assess the quality of information used in costing.

2. To explain how to support your organisation improve the quality of the data it uses for costing.

3. To explain how to manage data quality issues in information used for costing in the short term.

4. To explain what to do when information is not available for costing.

Scope

5. All information required for the costing process.

Overview

6. As a costing practitioner, you are not responsible for the quality and coverage of information collected in your organisation. However, you are ideally placed to raise data quality issues.

7. This standard provides guidance on how you can minimise the impact of poor-quality activity information when producing cost information. These are short-term measures that allow you to produce cost information in line with the

costing principles while your organisation continues to work on the quality and coverage of its information as a whole.

8. Most of the required information[12] should be held on your information systems, but its availability will vary due to different information management practices and the capacity of your information technology.

9. This standard does not provide guidance on complying with information governance requirements, including confidentiality, data protection and data security. You should consult your organisation's information governance teams on policies and procedures.

10. Agree with informatics colleagues

    - the format of information
    - frequency of information feeds and
    - any specific data quality checks for costing purposes.

11. Use this information to populate the information feeds log in your integrated costing assurance log (ICAL). An example of a completed patient-level feeds log is given in ICAL worksheet 1: Patient-level activity feeds.

12. Access locally-held information for allocating overheads, such as headcount information for allocating HR costs.

13. Work with your informatics colleagues and relevant services to streamline the process for extracting the information required for costing.

Approach

Assessing the availability of information for costing

14. You should work with your informatics department and the relevant services to assess the availability of data against Ambulance standard IR1: Collecting information for costing, and to streamline processes for extracting what is required.

[12] As specified in Ambulance standard IR1: Collecting information for costing.

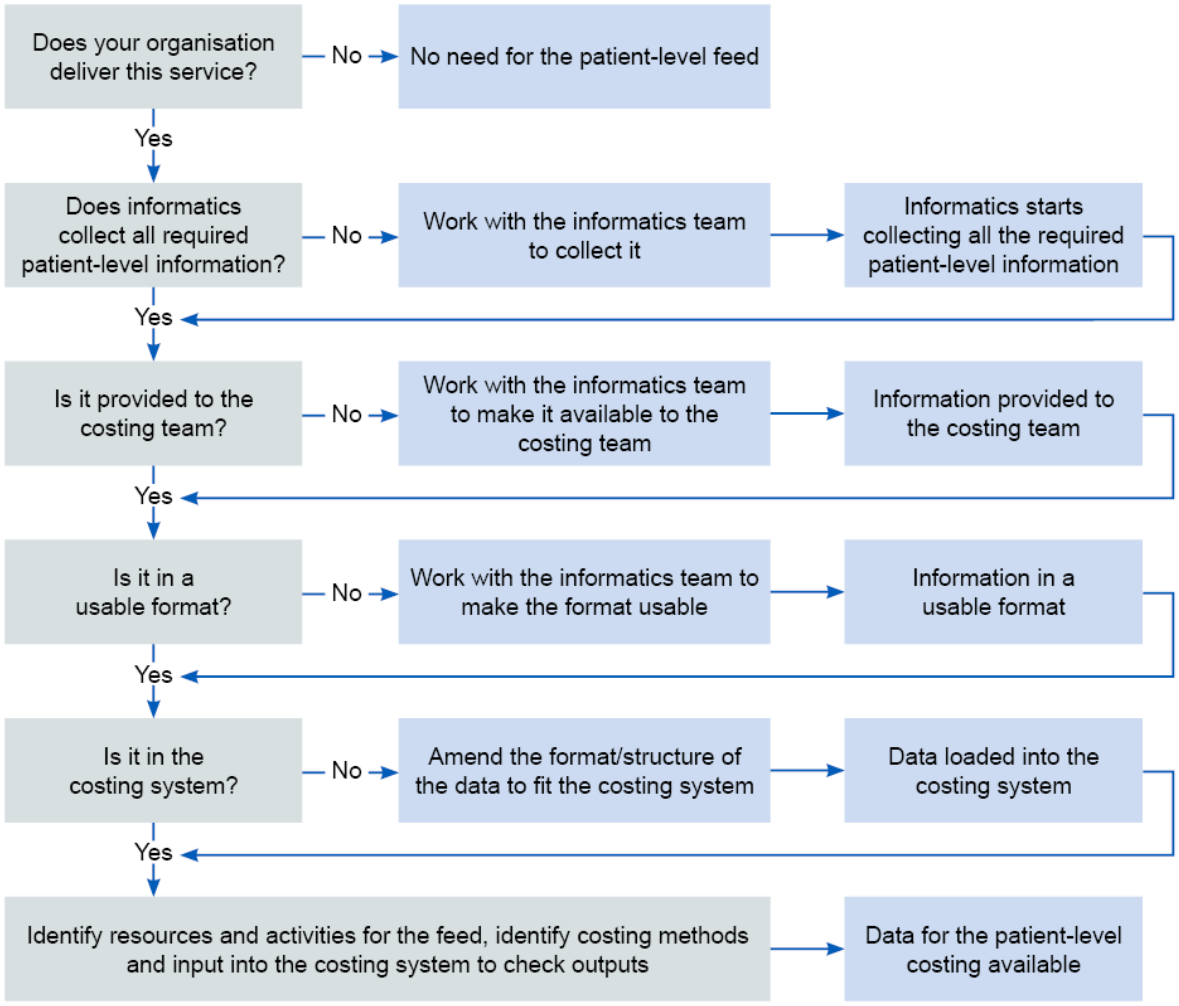
15. The quality of information varies between organisations. The specific data fields in each feed are given in Spreadsheet IR1.2. Their availability can be grouped as:

    - **Available from computer-aided dispatch (CAD) systems (most fields in feeds 20 to 22):** activity and patient data are recorded based on semi-automated job cycle stage triggers – for example, arriving at the scene, leaving the scene, arriving at the treatment location – from response vehicles and dispatchers, and callers' answers to questions they are asked over the telephone by the call handler.
    - **Available from your local information systems (feeds 23 and 24):** this information is collected from local information systems other than CAD. The availability of the information varies depending on how advanced the local systems at your organisation are – for example, some providers do not collect all the fleet and staff information required.
    - **Available but not necessarily in a usable format (certain fields in feed 22):** activity and patient information from patient report forms (PRFs) completed for each patient by frontline staff. This is often captured and stored on paper, making it difficult to incorporate with other data sources on any scale. Providers with integrated electronic patient record (EPR) systems should use this data source where possible and appropriate, either instead of information from the CAD system or as a supplement to it.
    - **Not currently available (certain fields in feeds 20 to 22):** for example, number of patients treated at the scene.

16. Work with your informatics colleagues and relevant services to assess data availability for costing.

17. If you are not collecting the required information, you must work with the relevant departments in your organisation to begin collecting it and to make it available for costing. Figure IR2.1 shows you how to access data for costing.

Figure IR2.1: Making data available for costing



18. If you cannot achieve all the information requirements initially, you should prioritise accessing:

    - fleet information
    - staff information
    - data fields to:
        - flag whether an incident involves one or more patients
        - provide a proxy count of patients based on the number of vehicles arriving at a treatment location.

Data available from systems other than CAD

19. Payroll data should be available from an internal system such as the electronic staff record (ESR), and rota data should be available from an

internal system such as the global rota system, to provide the information required for Feed 23: Staff information.

20. If you do not currently collect shift data, you should work with your informatics department and relevant operational or scheduling departments to collect it.

21. You should use staff payroll data to allocate staff costs to the activities these staff deliver. Your CAD system should record which staff respond to which incidents. However, if it does not, continue to use your current method and work towards obtaining the required information. Record the information you collect and the approach you use in ICAL worksheets 2: Additional information source and 14: Local costing methods.

22. Note that you must ensure that relevant information governance requirements are complied with when accessing individual payroll data.

23. Depending on the development of your fleet management system, Feed 24: Fleet information may or may not be available at your organisation.

24. If your organisation does not collect the required fleet information, continue to use your current method and work towards obtaining the required information. Record the information you collect and the approach you use in ICAL worksheets 2: Additional information source and 14: Local costing methods.

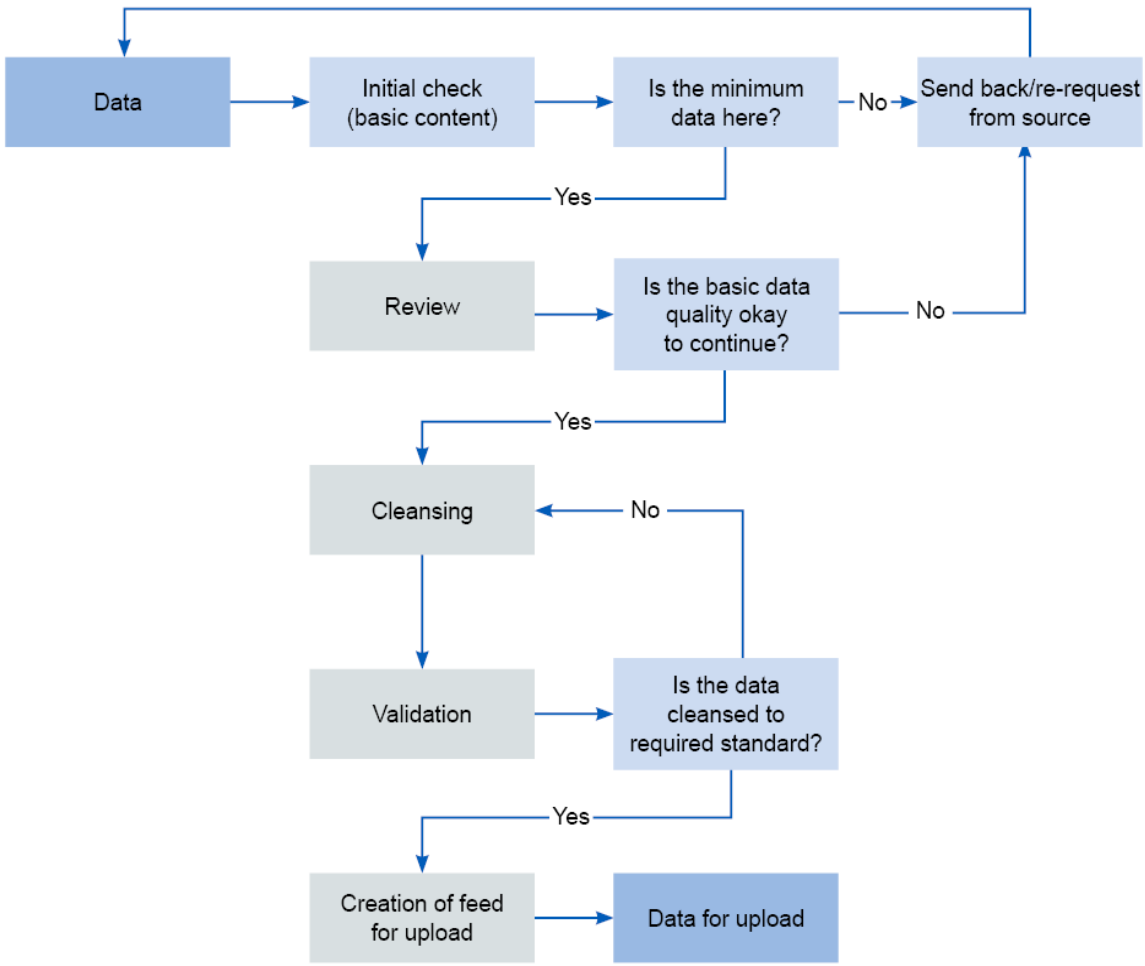
Available data that may not be suitable for costing

25. Providers complete a paper PRF for each patient they treat or convey. In some cases, multiple forms may be completed for the same patient – for example, when care switches between different frontline staff, or when a patient is observed over a long time.

26. The adoption of EPR systems varies widely, with many providers still using paper forms; EPR systems vary in their ability to link to hospital systems.

27. EPR data is not currently used in costing. Any plans to incorporate EPR data into costing will have to ensure the data is available in a useable format and is of high enough quality (see Figure IR2.2).

Figure IR2.2: Establishing data quality improvement measures



28. In future, quality EPR data could provide a rich and accurate source of data for costing at the patient level. Costing systems should be set up in anticipation of this data source becoming available.

Unavailable data and future requirements for data collection

Linking duplicate calls

29. All call handling activities are recorded in your CAD system. However, when more than one call is made about an incident, only the main call is linked to the incident; all duplicate calls are recorded separately.

30. To accurately allocate call handling resources it is important to link activity data about all calls, including duplicates, to an incident. This enables you to allocate costs based on the duration of all relevant calls, not just the main call.

Developing a way to obtain this information is a goal for the future development of the standards.

Telephone clinical advice

31. There are two issues with the activity data on giving telephone clinical advice:
    - some providers do not record the duration of giving clinical advice to patients by telephone (ie hear and treat) separately from answering the call and triage, ie, no time stamp is recorded to separate the two activities
    - time clinical advisors spend talking to ambulance crews is not recorded.

32. Separating call handling activities from telephone clinical advice activities is important as different resources need to be allocated to the two types of activity. Developing a way to obtain this information is a goal for future development of the standards.

33. In this version of the standards we include a yes/no option for providers that can be used to record when telephone clinical advice is given to ambulance crews (see Spreadsheet IR1.2).

Number of patients

34. In the absence of EPR data, the number of patients treated at the scene cannot currently be recorded. Developing a way to obtain this information is a goal for the future development of the standards.

35. The number of patients conveyed to hospital is not currently recorded by any ambulance provider. Developing a way to collect this data without increasing the workload for call takers or ambulance crews is a goal for the future development of the standards.

Other patient information

36. Some patient information, such as NHS number, age, gender and clinical data beyond chief complaint, is either unavailable or of poor quality. The full adoption of EPR systems will significantly improve the quality of this information, which is important for meaningful analysis of cost information.

37. All the issues above are summarised in Table IR2.1 below.

Table IR2.1: Variably available information for costing

Unavailable items or items with varying availability	Issue
Linking duplicate calls	CAD systems only allow one major call to be linked to an incident. Duplicate calls about the same incident cannot be linked.
Separate time stamps for call handling and providing telephone advice to patients	Some providers do not distinguish between hear and treat and call handling time.
Time stamps for when clinicians provide telephone advice to ambulance crews	Some providers do not distinguish between hear and treat and providing telephone advice to ambulance crews; others have separate resources for each.
Number of patients at the scene	Field exists in some CAD systems based on a question asked during emergency calls, but the data quality of the field is known to be poor. Providers using EPR can count the forms completed for unique patients.
Number of patients conveyed to hospital	Field exists in some CAD systems but is reported not to be widely used. When it is, the data is not collected systematically.
Patient information (NHS number, age, gender, etc)	Missing values for a significant number of patients.
Clinical data beyond chief complaint	Main source is PRF, which is often available in paper form only and data cannot currently be integrated into the costing system.

Using information in costing

38. Costing is a continuous process, not a one-off exercise for a national collection.

39. If your organisation has its own quarterly or monthly cost data for local reporting and business intelligence, you may only need to run the patient-level costing once a year for the national collections.

40. If your organisation has no other form of cost data, run the process quarterly as a minimum, although we consider monthly to be best practice.[13]

[13] The benefits of real-time data can be found here

41. The benefits of frequent calculation of costs are:
    - effects of changes in practice or demand are seen, and you can respond to them while they are still relevant
    - internal reporting remains up to date
    - mistakes can be identified and rectified early.

42. It is important that the costing system is configured to recognise whether a load is in-month or year-to-date, or it may not load some of the activity.

43. To ensure the costing system is loading everything it should, follow the guidance in Ambulance standard CP5: Reconciliation, and use the patient event activity reconciliation report (see Spreadsheet CP5.1).

44. Bespoke databases, such as fleet management, use the descriptions and codes provided when they were set up. Over time these codes and descriptions may change, become obsolete or be added to. You should map all the descriptions and codes used in the auxiliary and supplement feeds to those used in the master feeds to ensure the costing allocation methods (particularly matching) are applied correctly. These should be reviewed in a rolling programme.

Refreshing the information feeds

45. Note the difference between a refresh and a year-to-date feed. A **year-to-date feed** is an accumulation of in-month reports (unless the informatics team has specified otherwise). A **refresh** is a rerun of queries or reports by the providing department to pick up any late inputs. The refreshed dataset includes all the original data records plus late entries.

46. Services will continue to record activity on systems after the official closing date and this activity needs to be costed. Therefore you need to pick up entries made after the period closes – and they may be numerous – by refreshing the data.

47. Get a refresh of all the information feeds:
    - six-monthly – for the previous six months (April to September)[14]

[14] You should do a six-monthly refresh in November to refresh data feeds from April to September.

- annually – for the previous financial year (April to March).

48. A challenge for costing practitioners is that changes as a result of the refreshes can alter the figures in service-line reports. With the help of the relevant services' management accountant leads, you need to explain significant changes to users of the service-line reports, highlighting the impact of late inputs to the department providing the information feed.

Using information in the costing system

49. If the costing system needs to calculate durations – for example, time on scene in seconds, it needs to know which columns to use in the calculation. If the durations have already been calculated and included in the feed, the costing system needs to know which column to use in allocating costs. For the prescribed information feeds, the derived duration fields are included in column D in Spreadsheet IR1.2.

50. Once you decide the method of calculation, use this information to populate the log showing how the costing system uses information feeds in ICAL worksheet 1: Patient-level activity feeds.

Managing information feeds

51. For each entry you should keep a log of data feeds in ICAL worksheets 1 to 7 including:
    - the feed's source system, data table name, department, named person and a deputy responsible for providing the data source to you
    - whether it is an in-month or year-to-date feed
    - period covered by the feed – for example, all activities undertaken in the calendar month
    - format of information to be loaded into the costing system: SQL script, Excel spreadsheet or text file (eg CSV)
    - the working day on which the costing practitioner will receive the feed
    - any known quality issue with the data source and solutions
    - number of records on the feed.

Supporting your organisation to improve data quality for costing and managing data quality issues in the short term

Data quality issues

52. The quality of time stamp data for job cycle elements varies. Some providers may have many missing values for job cycle element start and end time. This information is vital in cost allocation, as duration of job cycle elements is used as a weighting in many of the allocation methods prescribed (see Spreadsheet CP3.3). You need to talk to your informatics colleagues to look for ways to improve data quality. Methods to treat gaps caused by missing time stamps in job cycles should be developed locally and recorded in ICAL worksheets 6: Activity data quality checks and 7: Activity data cleansing.

53. You need to be aware that the chief complaint or initial diagnosis recorded for a patient does not always accurately reflect their medical problem. This is because it is based on symptoms reported according to triage system coding, not a medical diagnosis by a clinician who has assessed the patient in person.

54. For providers that have fleet management systems, their use and the quality of data available from them vary. You should be aware of this and perform quality checks on fleet data (see Figure IR2.2) before incorporating it into your costing system.

Data quality checks

55. Follow a three-step quality checking process for costing data:

    - **Step 1 – Review the source data:** identify any deficiencies in the feed, including file format, incomplete data, missing values, incorrect values, insufficient detail, inconsistent values, outliers and duplicates.
    - **Step 2 – Cleanse the source data:** remedy/fix the identified deficiencies. Follow consistent rules and log your alterations, creating a ‘before’ and ‘after’ copy of the data feed. Applying duration caps is part of this step. Always report data quality issues to the department supplying the source data so they can be addressed for future processes. Keep data amendments to the minimum, only making them when fully justified and documenting them clearly.

- **Step 3 – Validate the source data:** you need a system that checks that the cleansed and correct data is suitable for loading into the costing system. This may be part of the costing system itself. Check that the cleansing measures have resolved or minimised the data quality issues identified in Step 1; if they have not, either repeat Step 2 or request higher quality data from the informatics team.

56. Consider automating the quality check to reduce human errors and varied formats. Automatic validation, via either an ETL (extract, transform, load) function of the costing software or a self-built process, can save time. But take care that the process tolerates differences in input data and if not, that this data is consistent. Otherwise you risk spending disproportionate time fixing the automation.

57. Your organisation should continuously improve data quality for audit purposes. Request changes to the information feeds from the source department or informatics team, then review the revised data for areas to improve. Set up a formal process to guide these data quality improvement measures and ensure those most useful to costing are prioritised.

Use of duration caps

58. Moderate outlier values by rounding them up or down to bring them within accepted parameters. Review the feeds to decide where to apply duration caps and build them into the costing system.

59. You can apply a cap to reduce outliers – for example, a call that is not properly closed and appears to last over six hours could be reduced to six hours. Applying duration caps removes the distraction of unreasonable unit costs when sharing costing information.

60. Capped data needs to be reported as part of the data quality check. The caps need to be clinically appropriate and signed off by the relevant service.

61. An example duration cap is given in Table IR2.2. Such caps should be used as the default in the absence of better local assumptions.

62. While caps moderate or even remove outlier values, studying these outliers (ie unexpected deviations) is informative from a quality assurance point of view. You should record the caps used and work with the informatics department

and the department responsible for the data feed to improve the data quality and reduce the need for duration caps over time.

63. Record any duration caps you use in ICAL worksheet 1: Patient-level activity feeds, showing how the costing system uses patient-level activity feeds.

Table IR2.2: Example of duration caps

Feed no	Feed name	Field name	Duration (seconds)	Replace with
1	Incident information	Call duration	≥3,601	3,600

When information is not available for costing

64. Information for costing may be unavailable because data is not:
    - collected at an individual patient level
    - given to the costing practitioner
    - in a usable format for costing
    - loaded into the costing system and included in costing processes.

65. If you are missing any of the required data fields in Spreadsheet IR1.2, follow the steps shown in Figure IR2.2 above to make the data available for costing.

66. Until the data becomes available, you need to:
    - continue to use your current methods
    - document these in your costing assurance log
    - start discussions with the department on how to obtain the information for costing.

CP1: Ensuring the correct cost quantum

Purpose: To set out how the general ledger is used for costing, and to highlight the areas that require review to support accurate costing.

Objective

1. To ensure the correct quantum of cost is available for costing.

Scope

2. This standard should be applied to all lines of the general ledger (GL).

Overview

3. You need the income and expenditure for costing. We refer to this as the 'GL output'. This output needs to be at cost centre and expense code level and is a snapshot of the general ledger at a point in time.

4. You do not require balance sheet items for costing.

5. You can bring your general ledger into your costing system by bringing in:
   - the trial balance: for audit purposes this should balance to zero or
   - only the cost and income: this should reconcile to your statement of comprehensive income.

6. The general ledger is closed at the end of the period, after which it cannot be revised.[15] For example, if in March you discover an error in the previous January's ledger that needs to be corrected, you can only make the correction in March's ledger. Doing so will correct the year-to-date position, even though

[15] Some systems may allow you to back-post payroll journals.

the January and March figures do not represent the true cost at those times, as one will be overstated and the other understated. Check with the finance team to ensure that only finally closed periods that contain any such changes are brought into the costing system.

7. The timing of when some costs are reported in the general ledger may pose a challenge for costing. For example, overtime pay for a particular month may be posted in the GL in the month it was paid, not the month the overtime was worked. This highlights a limitation in the time-reporting and expense payment system. We recognise this limitation but are not currently proposing a work-around for it.

8. Discuss the general ledger's layout and structure with the finance team so that you understand it. This will help you understand the composition of the costing output.

9. Keep a record of the input of cost into your costing system for each costing period. There may be multiple loads and we recommended each load is noted and recorded in integrated costing assurance log (ICAL) worksheet 12: GL load record.

Approach

Obtaining the general ledger output

10. The finance team should tell you when the GL has been closed for the period and give you details of any off-ledger adjustments for the period. You need to put these adjustments into your cost ledger (CL), especially if they are included in your organisation's report of its financial position, as you will need to reconcile to this.

11. Keep a record of all these adjustments in ICAL worksheet 11: Adjustments to the general ledger at each load,[16] to reconcile back to the general ledger output. Take care to ensure that any manual adjustments are mapped to the correct line of the CL.

[16] If the number of adjustments is significant, you can maintain a log of adjustments elsewhere and record the location of the file(s) in the costing assurance log.

12. Table CP1.1 below shows what the extract of the GL output must include.

Table CP1.1: General ledger output required fields

	Field name
1	Period (MM-YYYY)
2	Cost centre
3	Expense code
4	Monthly income or expenditure value (for use if you do in-month costing rather than year-to-date average costing)
5	Year-to-date income or expenditure value

13. You may choose either field 4 or 5 depending on the type of costing (monthly or year-to-date) your organisation undertakes.

14. Ensure the process for extracting the general ledger output is documented in ICAL worksheet 8: Extracting GL output. Extract this only after the finance team tells you it has closed the general ledger for the period.

15. The finance team should tell you when it has set up new cost centres and subjective codes in the general ledger, and when there are material movements in costs or income between subjective codes or cost centres. Cross-team approval increases the different teams' understanding of how any changes affect them.

16. **Finance teams should not rename, merge or use existing cost centres for something else** without informing you as not knowing when this has been done will cause problems for costing. Finance teams should close a cost centre and set up a new one rather than renaming it. If this is not possible, they should tell you about any changes.

17. The new GL cost centres and expense codes need to be mapped to the CL. You then need to reflect these changes in the costing system.

18. ‘Error suspense’[17] ledger codes need to be addressed so that all costs can be assigned accurately to incidents and patients. Work with your finance colleagues to determine what these codes contain so that they are mapped to the correct lines of the cost ledger.

19. You should have a rolling programme to regularly meet your finance colleagues to review the general ledger and its role in costing. This can identify problems and enhances their engagement with the use of the data.

20. Where income from a charitable donation appears in the GL it should be matched to the expenditure in the cost centre where the expenditure is recorded, using the income code to identify it. This allows compliance with both costing standards (income should be identifiable) and collections (charitable income can be netted off from the cost which it funded).

21. Where charitable cost centres are in the GL the expenditure and income on the cost centre should net to zero at the end of the costing period. The income not used would normally be deferred until the next period: but you should review any negative balances on the charitable fund costs centres and ensure the costing system does not offset the income against the cost of own patient care cost group. A set of charitable fund cost centres is shown in the CL as cost centre codes starting with WWW for transparency.

[17] Organisations may use a different name for dump ledger codes, eg error suspense codes and holding ledger codes.

CP2: Clearly identifying costs

Purpose: To ensure costs are in the correct starting position and correctly labelled for costing.

Objective

1. To ensure all costs are in the correct starting position and categorised in a consistent way for the costing process.

Scope

2. This standard should be applied to all lines of the general ledger.

Overview

3. The costing processes should identify and consistently allocate costs to enable meaningful analysis both locally and nationally.

4. An organisation's general ledger is normally set up for local requirements rather than to support the standardised cost process. This means that GLs will vary in structure.

5. This standard aims to ensure a process is in place to take this into account when the costing process starts, ensuring costs are mapped to resources consistently. To achieve this, the Approved Costing Guidance uses a standardised cost ledger.[18]

[18] See ambulance technical document spreadsheet CP2.1.

1. The standardised cost ledger ensures that as part of the costing process, all costs across the NHS are categorised and allocated in the same way. This process is called GL to CL mapping.

2. This standard describes a flexible approach which enables you to decide between two methods of GL mapping. These methods are defined as:

   - **Method 1 – Essential mapping:** This method will take your GL chart of accounts directly to the collection resources or overheads.[19]
   - **Method 2 – Full mapping:** This method will take your general ledger and map all the GL codes to our standardised cost ledger.

3. This standard describes the process for Method 2 mapping[20] as this is our preferred treatment for most organisations.

4. It also details how you should allocate overheads to patient-facing resources so that they can be distributed to activities.

5. As part of your costing process, you may encounter elements of negative cost and the treatment of these are explained at the end of this standard.

6. There will also be some areas of your ledger that need specialist treatment. You should ensure you understand and implement CP5: Reconciliation and CM8: Clinical and commercial services.

Approach

7. The following key principles enable you to clearly identify costs and allocate them according to the prescribed methodology:

   - Patient-facing costs relate directly to delivering patient care and are driven by patient-facing activity.

   - Patient-facing costs should be allocated using an activity-based allocation method and can be either pay or non-pay.[21]

[19] In completing method 1 you should ensure you do not miss costs which need remedial action to get them in the right place to start the costing process.
[20] You can find more detailed explanations with examples in the ledger mapping costing extensions.
[21] The allocation of resources is covered in Standard CP3: Allocating costs to activities.

- Patient-facing costs are grouped into resources for allocation and linked to activities in the costing process.
- Overheads do not directly relate to delivering patient care, and many relate to running the organisation. For example, they may be a corporate service, eg finance, or may a service method, eg ward clerk.
- Overheads such as finance and HR are allocated to all services that used them, using a prescribed allocation method. These costs should not be directly mapped to resources and activities in the costing process.
- Income can be clearly and transparently identified.

8. Work with your financial management team to ensure costs are aligned to the correct location in the cost ledger starting with the most material items first.

Mapping methods

9. This standard enables two methods to implement the mapping from your GL to the CL.

10. You may choose to implement either mapping method. You may change mapping methods to meet the needs of your organisation. You may combine mapping methods if that better represents your organisation.

11. Whichever method you choose:

    - you must understand the GL, especially larger items, and make sure that costs are mapped appropriately to resources
    - ensure the costing system reconciles at resource method; otherwise further steps will not reconcile and may prove more complex to unravel.[22]

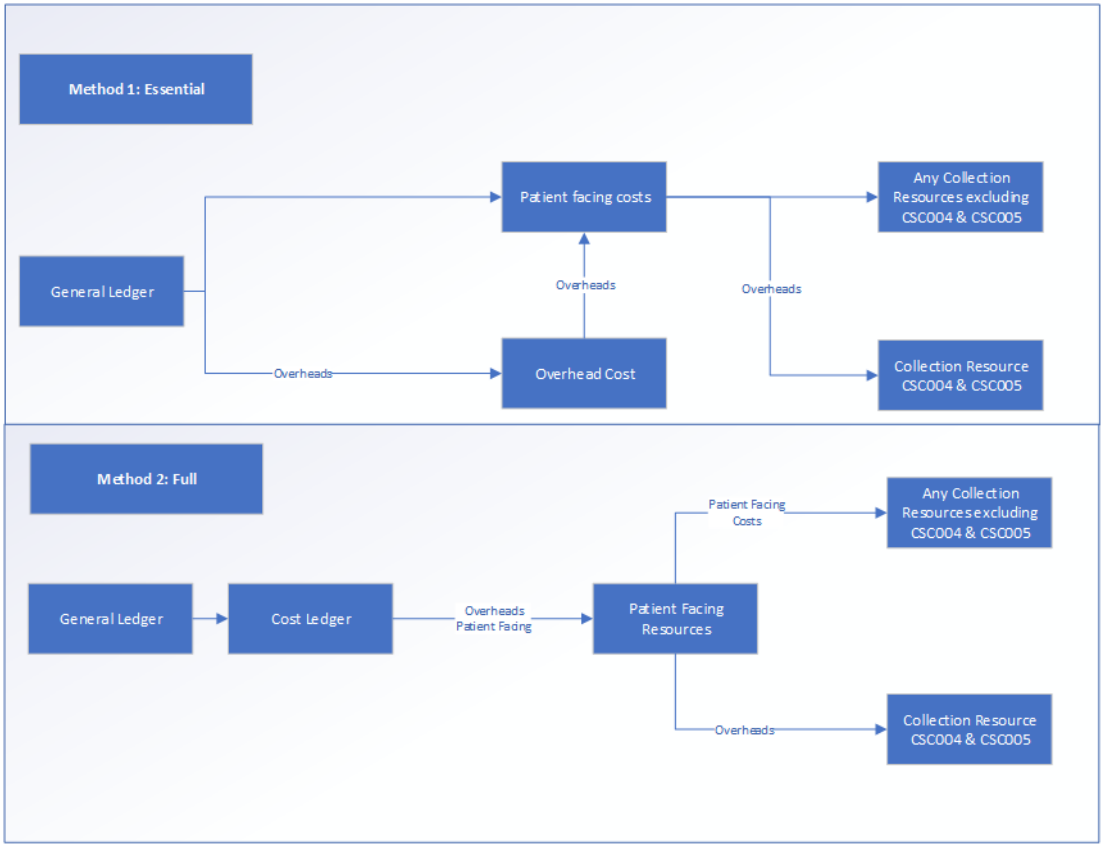
12. Over time, all trusts should aim to use method 2 mapping where method 1 does not ensure consistency for national level analysis.

[22] Refer to Standard CP5: Reconciliation and costing extension: Assurance of cost data.

13. Even on full implementation, trusts may wish to retain some elements of method 1 mapping if that is more suitable for the environment you are working in.

14. Figure CP2.1 shows the application of the CL to the organisation's GL in the two mapping methods.

Figure CP2.1: Mapping methods



15. Complying with method 2 advocates an in-depth investigation of the GL to understand the costs it contains but you shouldn't get overly focused on any immaterial details.

16. In completing method 2 ensure that you don't allow it to become too time consuming by focusing on materiality and using the GL to CL automapper application.

17. Method 2 provides a way to get the costs into the right starting position with the appropriate label – that is, from your GL to the CL costing account codes and then to the correct 'resource' codes.

18. Method 1, however, is more straightforward and aggregates costs to ‘collection resources’. There are benefits to implementing method 1 including the ability to establish a holistic view of your GL costs.

19. If you use method 1, retain evidence of your mapping exercise if this can’t be completed in your costing software. It should evidence that all material costs have been considered.

20. Regardless of the mapping method implemented in your organisation, you should still comply with the prescribed resource and overhead allocation methods in Spreadsheets CP2.2 (for overheads), CP3.3 (for patient-facing resources).[23] You should not use locally defined allocation methods to allocate costs unless prescribed.[24]

21. In addition, in some circumstances you may wish to implement superior costing methods or permission substitutions.

22. Trusts that choose to adopt method 1 **may**:

    - increase risk of the inaccuracy as there is potential for costs to not flow through the costing process correctly
    - be more likely to have costing assurance visits to ensure their costs are in the correct starting position, correctly labelled and classified consistently if inaccuracies are identified during the mandated collection.

23. The paragraph above outlines the potential risks of adopting method 1. Trusts should be aware of these risks and plan appropriate mitigations.

24. If as an organisation, you choose not to complete the full GL to CL exercise, it is important to understand method 2. Appendix 1 outlines the main premises of the two mapping methods.

Implementing method 2

25. The cost ledger outlines the chart of accounts suitable for most costs in most provider organisations but is not intended to be exhaustive. Where the CL does not have a combination (of cost centre and expense code) required for

[23] See Standard CP3: Allocating costs to activities for more detail.
[24] Where this is not possible note it in your ICAL and ensure your provider executive team are aware.

your organisation, you should refer to the resource application hierarchy (RAH) tool[25] and customise your cost ledger.

26. It is important to remember that the initial GL to CL mapping is a one-off exercise when setting up your PLICS; but you should review the mapping exercise once a year, in line with any refresh of the integrated technical document, to ensure it remains representative of how the costs in each part of your general ledger are used for costing.

27. The process of GL to CL mapping may run incrementally or simultaneously. For ease of understanding, we describe the process in linear steps.

28. The transformation of the GL into the CL should occur within your costing system to ensure that mappings can be traced and reconciled to your GL.

29. If in your costing system, the costing process takes place at a more granular level than the prescribed costing resources, you may continue using this method. The use of local resources or cost items will require the implementation of an additional mapping process.[26] You should log the method you use in ICAL worksheet 15: Superior costing methods.

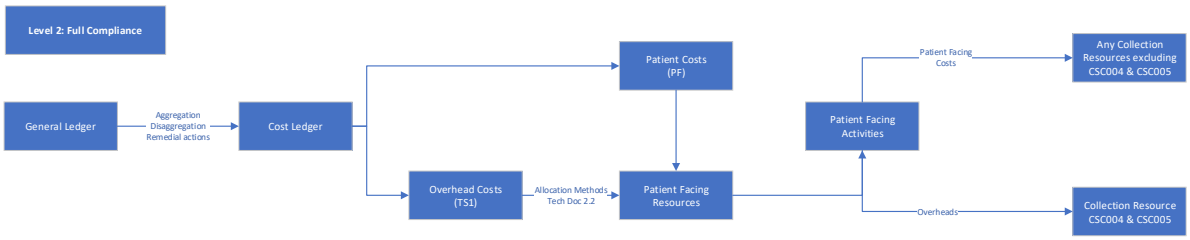
30. Your actions should include:

- **Disaggregation**: Some costs may be reported in the general ledger at a level that is not detailed enough for patient-level costing: multiple costs are combined in a singular GL code. These costs need to be disaggregated when creating the cost ledger, using an appropriate method
- **Aggregation**: Some costs may be reported separately in the general ledger, but for patient-level costing these costs can be aggregated when creating the cost ledger to simplify areas with the same treatment.
- **Remedial actions** – If a cost has been incorrectly recorded in the general ledger, it should be corrected at this point.

[25] The RAH can be found in the prescribed tools section our costing guidance
[26] You must document your mapping assumptions in ICAL worksheet 15: Superior Costing Methods

31. At the same time or following the system process to put the costs into the right starting place following the GL to CL mapping, the costing system will undertake a process called reciprocal costing[27].

Figure CP2.3 Simplified costing process



Treatment of overheads (including reciprocal costing)

32. Certain costs in your GL are not patient facing but provide the support services for clinical and non-clinical areas. These are called overheads.

33. Overhead costs refer to those expenses associated with running an organisation that can't be directly linked to the treatment of a patient. Overheads are incurred regardless of activity level.

34. Overheads should be allocated to the cost centre(s) which use the service using prescribed allocation methods. Once the overhead has been allocated to the cost centre(s), it should be apportioned to the expense codes within the cost centre(s)

35. Overheads are grouped into overhead titles and assigned a T1S code in Spreadsheet CP2.2. Each T1S code, and their allocation method, are shown in Spreadsheet CP2.2.

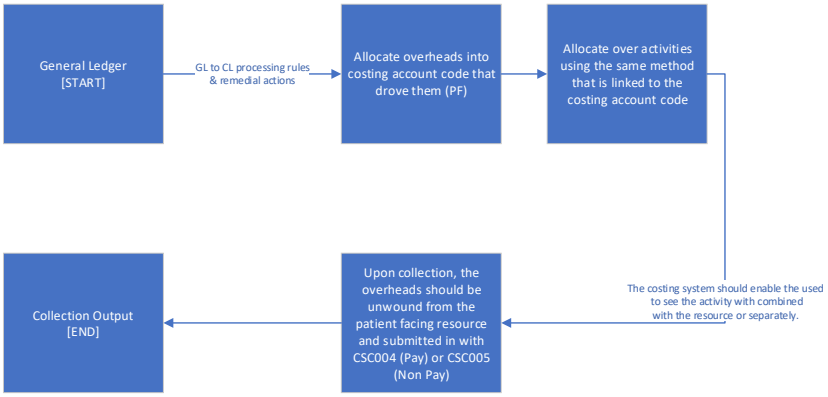
36. You may use an appropriate two-step allocation method which incorporates an activity-based method. This type of treatment would be classified as a superior method.

37. Figure CP2.4 describes the treatment of overheads from the GL to CL to collection. Overheads that have been absorbed to patient-facing resources

[27] Reciprocal costing is discussed further in paragraphs below.

need to be separated for the cost collection and grouped into the two support collection resources; CSC004 (Pay) and CSC005 (Non Pay).

Figure CP2.4 Simplified GL to collection output



38. Using an expenditure-based allocation method, some areas of the ledger may get a larger proportion of the allocated overheads because of specific high-cost items.

39. Costs that may affect the allocation calculation include the Clinical Negligence Scheme for Trusts (CNST), high-cost medicines, interventional radiology/nuclear medicine consumables or prostheses. If so, investigate and correct the overheads allocation[28] and adjust the allocation to allow for this. Any amendment to overheads should be recorded in your ICAL worksheet 13. Percentage split of allocation bases

Devolved and centrally held costs

40. During your review of the GL, it is important to identify whether a cost is centrally held or has already been devolved[29] to the relevant cost centres in the CL – for example, as part of service-line reporting.

41. Table CP2.1 shows the treatment of devolved and centrally held costs.

[28] For example, you may need to reduce the amount of overhead being allocated to a particular service.
[29] You may find it useful to discuss centrally held or devolved costs in you GL with your financial management department.

Table CP2.1: Devolved and centrally held costs

Cost location in GL	Standard requirement
Held centrally	Use the prescribed allocation method
Already devolved to the cost centre that used it, using the prescribed method or a superior method	No action – costs are already in the correct place. You do not need to aggregate the costs
Already devolved to the cost centre that used it, but not using the prescribed method or a superior method	Aggregate to a central code, so the process will use the prescribed allocation method

Reciprocal costing

42. This standard prescribes reciprocal costing. This enables allocation of overheads across patient facing and other overhead cost centres, as all those services have 'used' the cost of the overhead.

43. You should do this using a **reciprocal** allocation method, which allows all corporate support service costs to be allocated to, and received from, other corporate support services. For example, HR costs should be allocated across all cost centres that have staff, as all staff benefit from HR services.

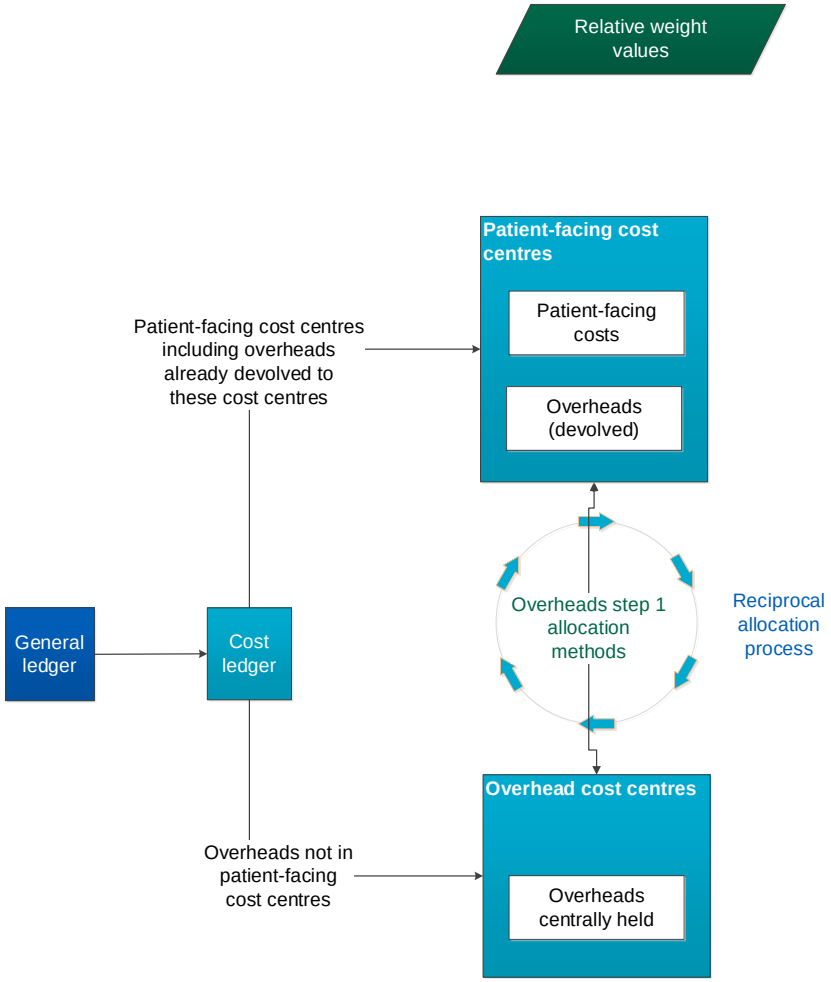
44. Reciprocal costing must take place within the costing system.

45. Overheads should **not** be allocated using a hierarchical method as this will only allow cost to be allocated in one direction between corporate support services.[30]

46. A reciprocal allocation method reflects the interactions between supporting departments, and therefore provides more accurate results than a hierarchical approach.

[30] Providers using a hierarchical method of allocation should adopt a reciprocal method as soon as possible. This can be done in conjunction with purchase of costing software or review of current costing software.

Figure CP2.5 Extract from Costing diagram – reciprocal costing



47. Following this process, patient facing costs with their allocated portion of overheads are then mapped to resources.

GL negative costs

48. With the wider finance team, you must consider any material negative costs. If the negative value is sufficiently material, you may want to treat it as a reconciling item, depending on the materiality and timing of the negative costs.

49. The main questions to ask before deciding are:

- What negative costs are there?
- Are they distorting the real costs of providing a service?
- Are they material?
- Do they relate to commercial activities?

50. It would be best practice to investigate with the wider finance team why negative cost balances have arisen. Several issues can cause negative values in the GL, which will be carried into the CL. We describe some of these below, with suggested solutions:

- Miscoding: Actual expenditure and accrual costs not matched to the correct cost centre and expense code combination.
- Journals: Where the value of a journal exceeds the total value in the cost centre for a specific period, a negative cost will be created.
- Timing of accrual release: A prior period accrual release can result in a material negative cost value. You must consider whether the timing creates an issue. You may need to report some negative costs caused by timing issues as a reconciliation item. For example, where the accrual is posted in the previous period and released in the next period, this can result in an overstatement in the previous period and understatement in the current period. To resolve this, you may need to report the net over-accrual as a reconciliation item to avoid understating the current-period costs. The same is true with an equivalent misstatement for income.

51. The costing process itself may create negative costs. This will include:

- GL to CL mapping movements: when more cost is moved than is in the expense code. To avoid this, you should use relative weight values or percentages to move costs rather than actual values. For example, 50% of the pay costs rather than a fixed amount.

52. Negative costs can be an issue because of traceable costs. If a particular cost per patient or unit is known and allocated to an activity rather than used as a relative weight value, and the total of the actual cost multiplied by the number of activities is greater than the cost sitting in the costing accounting code, it will create a negative cost.

53. Traceable costs should be used as a relative weight value. The only exception is where the traceable cost is of a material value and using the actual cost as an RWV will distort the final patient unit cost. If you do use the actual cost, you must ensure this does not create a negative value in the CL.

54. Clinical support functions: GLs are usually set up to show clinical support departments such as pathology, diagnostic imaging, and therapies in an identifiable manner. However, the costs may be recharged to other clinical services, leaving negligible values or negative costs in the originating cost centres. You should ensure the recharges are not creating negative costs, while still allowing the clinical support function to see all costs incurred in delivering their service linked to the patient-level activity.

CP3: Allocating costs to activities

Purpose: To ensure that the correct quantum of costs is allocated to the correct activity using the appropriate cost allocation method.

Objectives

1. To ensure each resource is allocated to each relevant activity using a single appropriate method, ensuring consistency and comparability in collecting and reporting cost information, and minimising subjectivity.

2. To ensure resources are allocated to activities in a way that reflects how care is delivered to the patient.

3. To ensure costs are allocated to activities using information from an appropriate source.

4. To ensure relative weight values (RWVs) reflect how costs are incurred.

Scope

5. This standard should be applied to all costs reported in the cost ledger and all activities undertaken by the organisation.

6. This standard covers relative weight values.

Overview

7. The standardised costing process using resources and activities aims to capture cost information by reflecting how those costs are incurred.

8. After mapping from the general ledger to the cost ledger and resources, the costing process allocates resources to incidents and patients in three steps:
   - allocate resources to activities (this standard)
   - match costed activities to the correct incident (Ambulance standard CP4: Matching costed activities to incidents and patients)
   - link the costed incidents to patients (Ambulance standard CP4: Matching costed activities to incidents and patients).

9. The allocation methods prescribed in the standards in most cases do not include an RWV for acuity or intensity. If you are using an RWV for acuity or intensity on top of the prescribed allocation method, continue to do this and record it in integrated costing assurance log (ICAL) worksheet 15: Superior costing methods.

Approach

Resources

10. Resources are the components used to deliver the activities, such as staff, equipment and consumable items. The costs of providing these resources are recorded in your general ledger, and the resource code prescribed by the standards groups these costs into themes.

11. In the standardised cost ledger (see Spreadsheet CP2.1) all patient-facing cost lines are mapped to the prescribed resources for you. Once you have mapped your general ledger to the standardised cost ledger, you will get a subset of resources that your organisation uses from the list shown in Spreadsheet CP3.1.

12. The costs within a resource may include overhead costs, as overheads are allocated to patient-facing resources to be allocated to activities (see Standard CP2 for more details). For example, the patient-facing frontline staff resource could include the costs of frontline staff salaries and overheads such as operational manager costs, station non-pay costs, HR and finance costs.

13. The transparency of these costs within each resource – what they are and where they come from in the general ledger – should be maintained throughout the costing process.

14. Once these separated costs have been calculated they can be aggregated to whatever level the resources have been set at, and you can be confident the resource unit cost is accurate because it is underpinned by this costing process.

Activities

15. Activities are the work undertaken by all resources to deliver the services required by patients to achieve desired outcomes: for example, answering a call or treating patients at the scene.

16. Together, resources and activities form a two-dimensional view of what costs were incurred to deliver activities. This can be displayed in a matrix such as that shown in Table CP3.1 below.

Table CP3.1: Example of a resource–activity combination in matrix form

Resource	Activity: treating patients at the scene
CAD system	XX
Fleet maintenance and repairs – internal	XX
Fleet preparation/cleaning	XX
Frontline staff – Band 5	XX
Frontline staff – Band 6	XX
Fuel	XX
Medical and surgical consumables	XX
Vehicle depreciation	XX
Vehicle insurance	XX

17. This standard prescribes a list of activities for ambulance services (see Spreadsheet CP3.2).

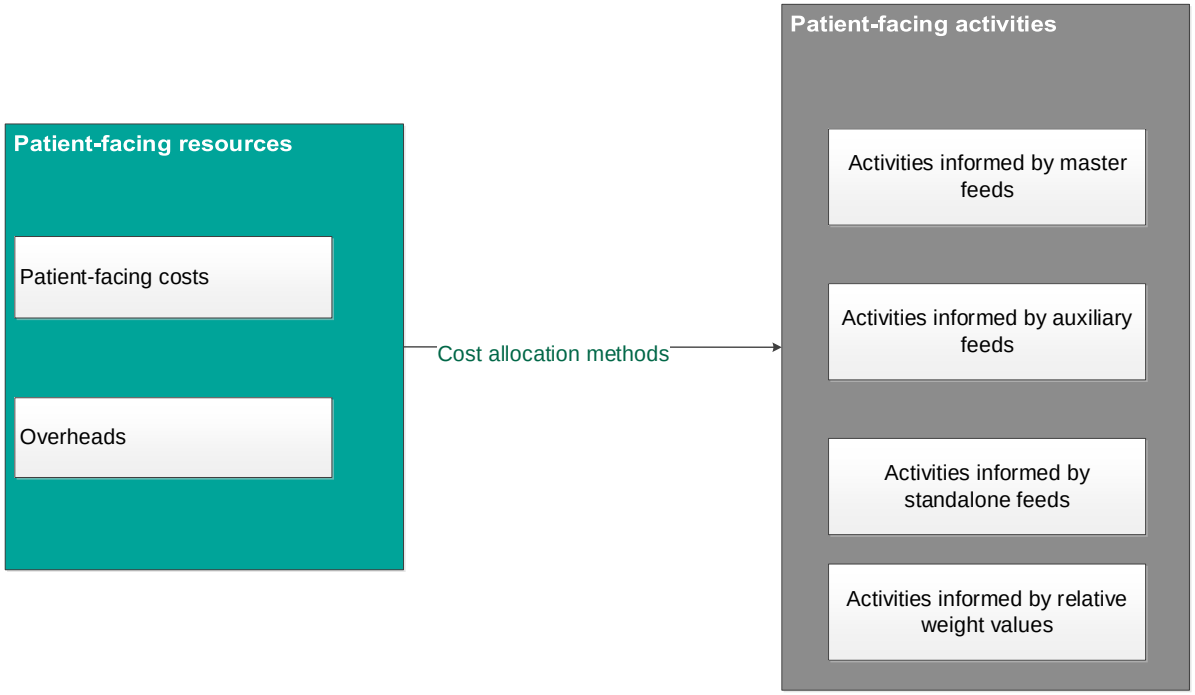
18. You need to identify all the activities your organisation performs from the prescribed list of patient-facing activities in Spreadsheet CP3.2.

19. Some activities are informed by activity feeds: for example, the activity mobile to scene (activity ID: AMA183) uses information from the Feed 21: Response information for costing.

20. Column F in Spreadsheet CP3.2 indicates which prescribed patient-level feed informs the activity, or if another information source is required where a patient-level feed is not prescribed.

Allocate resources to activities

Figure CP3.1: Extract from the costing diagram showing allocation of resources to activities



21. You need to use these prescribed resource and activity combinations in your costing system.

22. The resource and activity combinations used in the costing process for your organisation are identified by:

- obtaining the list of resources for your organisation from mapping your GL to the CL or mapping directly to resources (see Ambulance standard CP2: Clearly identifying costs)
- identifying the list of activities performed by your organisation from the prescribed list.

23. You should ignore activities and their related resources in the technical document if your organisation does not perform them.

24. You must allocate resources to the activities using the methods prescribed in column F of Spreadsheet CP3.3.

25. Resources need to be allocated to activities in the correct proportion. There are three ways to do this:
    - based on actual time, items or costs[31] from the relevant information feed prescribed
    - using RWVs[32] created in partnership with the relevant departments
    - using a local information source.

26. Where one resource needs to be apportioned to several activities, you need to determine the percentage of the cost to apportion to each activity after discussions with clinicians and managers, supported by documented evidence where available (eg paramedic rota plans). These splits and their basis should be recorded in ICAL worksheet 13: % allocation bases. Note this is a different process from disaggregating costs in your GL to map them to the CL.

27. One way to do this is to disaggregate the expense codes in the cost ledger further to resource/activity level. Figure CP3.2 below shows how this could look in the resource/activity matrix for a division of frontline staffing costs.

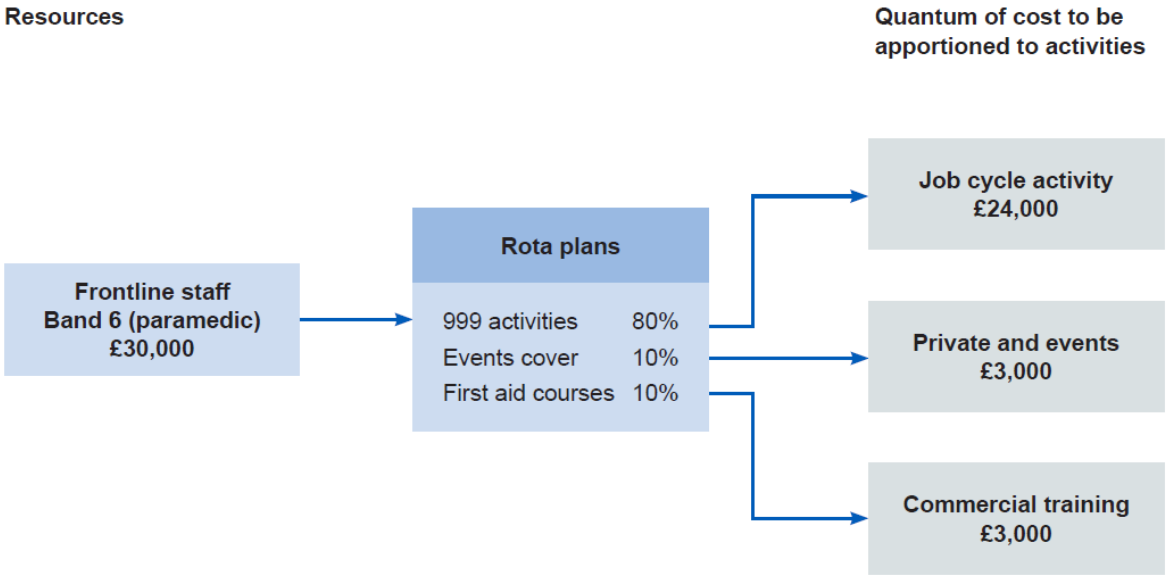
28. Note that frontline staffing resources do **not** need to be apportioned to each job cycle activity[33] as this is done when allocating resources to activities – that is, apportioning and allocating resources happens in one step (see Ambulance standard CM31: Allocating costs across job cycle elements).

29. Do not apportion resources equally to all activities without clear evidence they are used in this way, and do not apportion costs indiscriminately to activities.

30. Use an RWV unless there is a local reason for applying a fixed cost.

[31] The costs should be used as a weighting rather than a fixed cost.
[32] Relative weight values are statistics to allocate costs in proportion to the total cost incurred. They are an agreed weighting of an item used to allocate costs for a patient event.
[33] Includes the following activities: allocation to mobile, mobile to scene, time on scene, convey patients to treatment location, patient handover and handover to clear.

Figure CP3.2: Identifying the correct quantum of cost to be apportioned to activities



31. Where the same cost driver is used for several calculations in the costing system, and providing the costs can be disaggregated after calculation, you can aggregate the resources in your costing system to reduce calculation time. For example, if several resources for treating patients at the scene use the driver ‘duration of the activity’, you can add them together for the cost calculation.

32. If you have a more sophisticated cost allocation method for resources to activities:

    - keep using it
    - document it in ICAL worksheet 15: Superior costing methods
    - inform the NHS England and NHS Improvement costing team.

33. We do not accept some cost allocation methods as superior to the prescribed methods. These include using income or national averages to weigh costs.

34. The activity feeds will inform the cost allocation methods providing key cost drivers, such as duration of each job cycle element. The information feeds will also provide information about the relative weight values to be used in the costing process, such as fleet repairs and maintenance costs in Feed 24: Fleet information.

35. Investigate any costs not driven to an activity or any activities undertaken by your organisation that have not received a cost and correct these.

Relative weight values

36. You should allocate all material costs based on actual usage or consumption using the prescribed allocation method and an information feed. However, where there is no information feed, or the costs are immaterial, use an RWV to allocate costs.

37. RWVs are a method of using appropriate source information as a proportional (%) weighting to distribute or 'drive' the allocation of cost. An example of an RWV is shown in Figure CP3.2. RWVs may be used to:

    - disaggregate costing account codes so the cost can flow to different resources in conjunction with the mapping to the cost ledger (see Ambulance Standard CP2: Clearly identifying costs)
    - apportion overheads to resources (see Ambulance Standard CP2: Clearly identifying costs)
    - apportion resources where resources deliver more than one activity (see Figure CP3.2 as an example)
    - allocate costs from resources to activities
    - attribute costed activities to incidents.

38. One way to store the relative weight values for use in your costing system is to compile statistic allocation tables.

39. Income values and national cost averages should **not** be used as relative weight values.

40. Different costs will require different approaches to derive appropriate relative weight values to support their allocation.

41. Relative weight values should be reviewed on a rolling programme or when a significant change occurs in the relevant department.

CP4: Matching costed activities to incidents and patients

Purpose: To achieve consistency across organisations in assigning costed activities to the correct incident and patient(s).

Objectives

1. To provide methods to consistently assign costed activities to the correct incident.

2. To link costed incidents to patients to produce patient unit costs.

3. To highlight and report source data quality issues that hinder accurate matching and investigate unmatched activity.

Scope

4. This standard should be applied to all costed activities.

Overview

5. Matching is integral to accurate patient-level costing. For an accurate final patient unit cost, the costed activities need to be matched first to the incident and then linked to the patient(s).

6. The matching process for costed activities involves two steps:
   - matching activities to incidents
   - linking costed incidents to patients.

7. This two-step matching process is used because more than one patient can be treated in any one incident (which is widely used as the unit of activity for ambulance emergency responses). To derive the patient unit cost, you need to first match costed activities to the incident and then link these activities to the patient.

8. Matching costed activities to incidents can be done using one of two approaches:

   - for activities informed by an information feed, use the matching fields in the information feeds (see column E in Spreadsheet IR1.1)
   - for all other activities, use the prescribed cost allocation methods to match the costed activities to incidents.

9. Matching physical response stage activities[34] and some call-stage activities[35] to incidents take place before the costing process – it is done in your CAD system (see Ambulance standard IR1: Collecting information for costing). Therefore, you do not need to repeat this step to match these activities in the costing process.

10. Linking costed incidents to patient(s) can be done using either of the two approaches below. Which one you use depends on whether the incident involves one patient or more than one patient:

    - for single-patient incidents, link the costed activities matched to the incident to the patient recorded for the incident
    - for multiple-patient incidents:
      – first use the prescribed cost allocation rules to produce patient-level cost for each activity matched to the incident
      – then link the costed activities (at patient level) to the patients recorded for the incident.

11. Limitations of the data on number of patients, patient identifiers and other patient information (see Ambulance standard IR2: Managing information for costing for details) mean that exact matching of costed activities to each patient involved in one incident is not currently possible. The standards

[34] Including activities: allocation to mobile, mobile to scene, time on scene, convey patients to treatment locations, patient handover and handover to clear.
[35] Including call taking and telephone clinical advice.

prescribe cost allocation rules, and you are required to create proxy patient records to generate patient unit costs (that is, a patient-level cost).

12. We will update this standard with rules to match costed activities to individual patients once information is available to enable this; we anticipate this will be possible once the electronic patient record (EPR) system has been more widely adopted by the ambulance sector.

Approach

Matching costed activities to the incident

13. Figure CP4.1 adapted from the costing diagram in the technical document, shows the two-step matching process:

    - matching activities to incidents
    - linking costed incident to patients.

    Please refer to Spreadsheet CP3.3 for details of the matching and allocation rules.

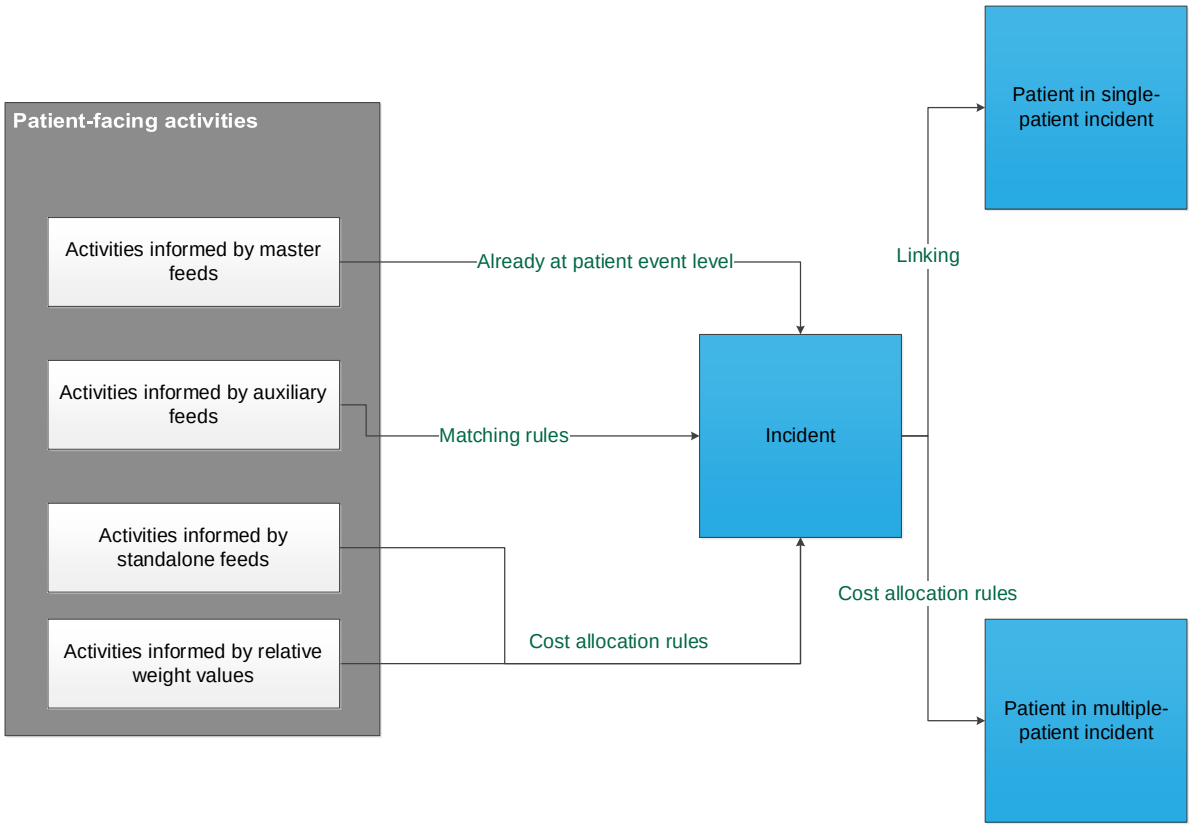
14. The prescribed matching fields ensure the relevant auxiliary information feeds can be attached to the correct incident.

15. The incident, call or response ID always generates the best match.

16. If you obtain your auxiliary information feeds from the CAD system and you can include the incident ID in the feeds, use this ID to match the auxiliary feed (eg response information feed) to the master feed (incident information feed).

17. Matching physical response stage activities and some of the call stage activities to incidents is done in your organisation's CAD system (see column G in Spreadsheet 3.3 for details).

Figure CP4.1: Extract from the costing diagram showing matching of costed activities to incidents and patients



18. However, there are problems matching activities to incidents when:

    - duplicate calls are taken
    - clinical advice is provided to an ambulance crew at the scene.

    These problems are discussed in Ambulance standard IR1: Collecting information for costing.

19. For unmatched duplicate calls, you should report them separately as an unrelated row(s) to any incident.

20. For unmatched clinical advice provided to an ambulance crew at the scene, you should treat the cost allocated to these activities as an overhead and absorb them to ‘Call handling and telephone clinical advice’ activities.

21. Once costed activities are matched to the incident, the next step is to link the costs to patients and create patient unit costs.

Linking incident-level costs to patients

22. The linking process to patient(s) differs depending on whether an incident involves one patient or more than one patient.

23. Use **number of vehicles arriving at the treatment location** in Feed 20: Incident feed as a proxy for the number of patients involved in each incident. Use this number to determine whether an incident is a single-patient incident or a multiple-patient incident. See Ambulance standard CM31: Allocating costs across job cycle elements and Ambulance standard IR2: Managing information for costing, for an explanation of why the proxy is used.

Linking incident-level costs to patients in single-patient incidents

24. Most incidents are single-patient incidents.[36] After matching the costed activities to these single-patient incidents, you should have the patient unit cost.

25. Where possible, you should then link the costed incident to the patients recorded for the incidents to create patient-level costs using recorded incident identifiers (activity ID) and patient identifiers (patient ID) in Feed 22: Patient information.

26. We know that patient identifiers are not always collected. In these cases, a proxy patient record (with a proxy patient ID) needs to be generated to create costs at **a patient level**.

27. You will now have patient-level costs for all incidents that involve single patients.

Linking incident-level costs to patients in multiple-patient incidents

28. A small proportion of incidents involve more than one patient. Creating patient-level costs from incident-level costs for these incidents involves two steps:

    - first use the prescribed cost allocation rules to produce patient-level cost for each activity matched to the incident

[36] Feedback from the ambulance costing technical focus group was that more than 90% of incidents ambulance trusts respond to involve only one patient.

- link the costed activities (at patient level) to the patients recorded for the incident.

Producing patient-level costs

29. Use **number of vehicles arriving at the treatment location** as a proxy for the number of patients conveyed, and then split the costs of each activity matched to the incident between this number of patients.

30. Use the cost allocation rules prescribed in column H (Step 3) Spreadsheet CP3.3 to allocate the incident-level activity costs to all the patients involved in an incident to derive the patient unit cost.

Linking to patients

31. Where possible, you should then link the costed incident to the patients recorded for the incident to create patient-level costs using recorded incident identifiers (activity ID) and patient identifiers (patient ID) in Feed 22: Patient information.

32. Limitations of the information collected on patients mean it is not currently possible to match every patient involved in a multiple-patient incident (see Ambulance standard IR2: Managing information for costing and Ambulance standard CM31: Allocating costs across job cycle elements).

33. We know that patient identifiers are not always collected. For multiple-patient incidents where the total number of patients recorded in Feed 22: Patient information is smaller than the number of vehicles arriving at the treatment location, proxy patient records (with proxy patient IDs) need to be created in Feed 22: Patient information. This is to ensure that all the costs at the patient level have a patient record to link to, and you are therefore costing '**a**' patient not '**the**' patient.

34. You will now have patient-level costs for all incidents that involve multiple patients.

Other considerations

35. The accuracy with which costed activities are matched depends on the quality of both master feeds and auxiliary feeds. Follow the guidance in Ambulance

standard IR2: Managing information for costing, to help your organisation improve its data quality.

36. If your matching rules are more sophisticated than the prescribed matching fields and improve the accuracy of your matching, continue to use them and record them in ICAL worksheet 15: Superior costing methods.

37. Your costing system should produce a report of the matching criteria used in the system, as described in Table CP5.1 in Ambulance standard CP5: Reconciliation, and you should have a rolling programme to review this.

Reporting unmatched activity for local business intelligence

38. Organisations have traditionally treated the cost of the unmatched activity in different ways. Most commonly, it has been absorbed by matched activity, a practice which can have a material impact on the cost of matched activity, particularly when reviewing the cost at an individual patient level for benchmarking and tariff calculation.

39. For local reporting purposes, we recommend you do not assign unmatched activity to other incidents or patients but report them as reconciliation items.

40. If reported unmatched activity forms a material proportion of an organisation's expenditure, this is likely to be due to poor source data. As this issue will deflate the patient unit cost, it needs to be identified and steps taken to improve the quality of the source data, rather than artificially inflating the patient unit cost by allocating unmatched activity. Please follow the guidance in Ambulance standard IR2: Managing information for costing, to support your organisation in improving its data quality.

CP5: Reconciliation

Purpose: To set out the process for reconciling costs and income to the organisation's accounts, and to reconcile the activity counts reported by the organisation.

Objectives

1. To ensure the cost and income outputs from the costing system reconcile to the organisation's accounts.

2. To ensure the activity outputs from the costing system reconcile to what the organisation is reporting.

Scope

3. This standard covers all costs, income and activity included in the costing process.

Overview

4. All the costing process outputs must reconcile to the information reported to the board, and in the final audited accounts. This ensures a clear link between these outputs and the costs and activity information captured in the source data.

Approach

Reconciliation of costs, income and activity

5. The costs and income outputs must reconcile to the main sources of this information, the GL output and the organisation's reported financial position.[37]

6. To demonstrate that the outputs of the costing process reconcile to the main sources of cost, income and activity information, the reports detailed in Table CP5.1 must be available from your costing system.

Table CP5.1: Cost, income and activity reconciliation reports

Report number	Report name	Report purpose
CP5.1.1	Input accounting reconciliation	Enables the totals for the cost ledger and income ledger to be reconciled to the monthly statement of comprehensive income (SOCI) reported by the board for the period reported on, as well as to the final audited accounts at year-end.
CP5.1.2	Internal reporting reconciliation	Shows the costs from the monthly, quarterly or annual report reconciled to the costs reported in the costing system. Clear records must be kept of any adjustments leading to differences between them, both for internal purposes and to provide a clear audit trail.
CP5.1.3	Locality or service level reports	Detailed reports of income and costs at provider level, service-line level, localities (eg clinical commissioning groups (CCGs), integrated care systems (ICSs) or locally defined operational areas), down to the level of each incident and patient. This should encourage operational engagement, as details of the resources and activities involved in each individual pathway will be available.
CP5.1.4	Output accounting reconciliation	Checks that the final costing outputs reconcile to those in the board reports and the audited annual accounts, with the option in the costing system to amend values for any post-closure adjustments, thereby ensuring that the final costing outputs reconcile to these earlier reports.

[37] See Ambulance standard CP2: Clearly identifying costs, for guidance on where adjustments may be made between the general ledger output and the cost ledger, to be included in your reconciliation.

Report number	Report name	Report purpose
CP5.1.5	Adjustments and exclusions report	Documents all the adjustments and exclusions to the total quantum. This must also reconcile annually to the final audited accounts to provide assurance when submitting data for mandatory cost collections.
CP5.1.7	Cost centre and categorisation reports	Assures users of cost information that all appropriate costs are accounted for as part of the costing process. These reports must be available at the levels of the cost centre, expense code, pay/non-pay/income and patient-facing/support costs.
CP5.1.8	Matching criteria	To show the matching criteria (matching fields) being used in the system to identify how many records are matched.
CP5.1.9	Unmatched activity	Costed activities that could be matched to an area but not to an incident within that area and costed activities that could not be matched to an area or an incident.
CP5.1.10	Cost group reconciliation	When the costing process is complete, enables the costs within the five cost groups to be reconciled to the cost ledger, with the total cost within these cost groups equalling the total in the cost ledger.
CP5.2.1	Core activity reconciliation	Shows the core ambulance activity used in the costing model reconciled to the original source data – for example, number of calls, number of physical responses, number of incidents, number of patients – with all exclusions and amendments clearly recorded and explained.
CP5.2.2	Patient event activity reconciliation	To show patient event activity used in the costing model – eg on-scene time – reconciled to the initial data feeds, with all exclusions and amendments clearly recorded and explained.
CP5.2.3	Board report reconciliation	Enables reconciliation of incidents used in the costing model to the board report based on geographical areas – for example, locally defined operational areas or CCGs. This activity must also be reconciled to the outputs of the costing system to ensure that all activity has been processed.
CP5.2.4	Full cost reconciliation	Shows the full costs for all the activities loaded into the costing system as part of the outputs of the costing model.

Report number	Report name	Report purpose
CP5.2.5	Timing differences reconciliation	If differences in the timing arise between capturing the activity in the costing system and the activity reported by the provider, a clear record must be kept so these differences can be explained. To avoid these timing differences, it is good practice to use a dataset for provider reporting produced on the same day as that to be used in the costing system.
CP5.2.6	Output activity reconciliation	Reconciliation should be performed by costing practitioners to demonstrate that the activity from the source datasets matches the outputs of the costing system, with the exception of any legitimate – and documented – adjustments or exclusions. This reconciliation report should encompass activity feeds received from the informatics team, data warehouse or equivalent, as well as any activity data captured and reported manually.
CP5.2.7	Non-NHS patient report	All activity that does not relate to NHS patients should be clearly identifiable and reportable to enable the use of the costing system to complete a reference costs return.

7. The activity outputs must reconcile to what your organisation reports. For example, if your organisation reports XX incidents in a costing period, your activity outputs should reconcile to this number. To avoid any reconciliation differences due to timing, information feeds used in the costing process and those reported by the organisation should be created at the same time.

8. Some activity datasets should be reconciled to external sources such as the national ambulance quality indicators return. Organisations should also reconcile activity to their contracting reports and other national submissions relevant to each service line, to ensure all data produced and submitted by an organisation is consistent and accurate.

9. You should also reconcile the activity outputs to the activity in the source datasets to ensure all the activity you entered into your costing system has been costed and then included in the costing output.

10. In your costing process, do **not** include activity that is recorded in your information feeds but the costs of which are incurred by another organisation. Report this activity in ‘cost and activity reconciliation items’.

11. To reconcile the activity used in the system to that actually carried out by the department/service, the activity count must be correct in the information feeds. Use the information feed log in ICAL worksheet 1: Patient-level activity feeds.

12. To support reconciliation and reporting, once the costing model is fully processed, the costs associated with incidents, patients and other cost groups should be classified into the five cost groups listed in Table CP5.2.

Table CP5.2: Cost and activity groups

Cost group	Description
Patient care	Includes the costs relating to the organisation's: • 999 service • patient transport service • NHS 111 service • GP out-of-hour service • other services
Education and training (E&T)	Costs relating to E&T in the organisation
Research and development (R&D)	Costs relating to R&D in the organisation
Other activities	Includes the costs related to the organisation's commercial activities
Cost and activity reconciliation items	Includes: • costs for which there is no corresponding activity, such as a frontline staff member who is employed by a provider to perform air ambulance service activity and the provider is unable to include this in its costing system • activity for which there are no corresponding costs, such as help from another provider to cover a major incident

13. Reconciling cost and activity has the following benefits:

    - patient unit costs reflect the true cost of treatment, undistorted by provider-incurred costs unrelated to the organisation's own-patient activity

- the true cost is more appropriate for benchmarking between peers as non patient-related costs can significantly affect cost reporting by different providers.

Proxy records

14. Proxy records may be generated for services that do not keep a record of patient contacts for information governance purposes; see Standard IR2: Managing information for costing.

15. You should ensure that proxy records are included in the activity reconciliation.

Services with sensitive/legally restricted data requirements

16. You will need to consider pseudonymising data for services with sensitive/legally restricted data. Some services have extra levels of required information governance because the legal data holding regulations and patient consent differ for them.

17. ‘A’ patient rather than ‘the’ patient will need to be costed. The reconciliation of both cost and activity with other trust records will need to take this into account.

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