NHS Improvement

Healthcare costing standards for England

Ambulance: Information requirements and costing processes

For data being collected in 2020 for financial year 2019/20

Final

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We support providers to give patients safe, high quality, compassionate care within local health systems that are financially sustainable.

Contents

Introduction

This final version of the *Healthcare costing standards for England – ambulance* should be applied to 2018/19 and 2019/20 data and used for all national cost collections. They supersede all earlier versions. All paragraphs have equal importance.

These standards have been through three development cycles involving engagement, consultation and implementation. Future amendments and additions to the standards may be required but will be made as part of business-as-usual maintenance. We thank all those who have contributed to developing these standards.

The main audience for the standards is costing professionals, but they have been written with secondary audiences in mind, such as clinicians and informatics and finance colleagues.

For ambulance services, there are three types of standard: information requirements, costing processes and costing methods.

- **Information requirements** describe the information you need to collect for costing.
- **Costing processes** describe the costing process you should follow.

These two sets of standards, contained in this document, make up the main costing process. They should be implemented in **numerical order**, before the costing methods.

- **Costing methods** focus on high volume and high value services or departments. These should be implemented after the information requirements and costing processes, and prioritised based on the value and volume of the service for your organisation.

All the standards are published on NHS Improvement's website.[1] An accompanying **technical document** contains information required to implement the standards,

[1] See https://improvement.nhs.uk/resources/approved-costing-guidance-2019

which is presented in Excel. Cross-references to spreadsheets (eg Spreadsheet CP3.3) refer to the technical document.

We have ordered the standards linearly but, as aspects of the costing process can happen simultaneously, where helpful we have cross-referenced to information in later standards.

We have also cross-referenced to relevant costing principles. These principles should underpin all costing activity.[2]

We have produced tools and templates to help you implement the standards. These are available to download from https://improvement.nhs.uk/resources/approved-costing-guidance-2019.

You can also download an evidence pro forma if you would like to give us feedback on the standards. Please send completed forms to costing@improvement.nhs.uk

[2] For details see *The costing principles*, https://improvement.nhs.uk/resources/approved-costing-guidance/

IR1: Collecting information for costing

Purpose: To set out the minimum information requirements for 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 minimum requirement for the information feeds as prescribed in the *Healthcare costing standards for England – 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; for example, journey time and on-scene time.

Overview

9. The standards describe three main information sources for costing:

    - activity information feeds
    - supplementary information feeds
    - relative weight values.

10. Any costs not covered in the prescribed information feeds need relative weight values or other local information sources to allocate the costs.

11. One way to store relative weight values in the costing system is to use statistic allocation tables.

12. You may be using additional 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 source.

13. The information requirements provide the following:

    - 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
    - the information to use to weight costs, eg the drug cost included in the medicines dispensed feed
    - 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.

14. Columns B and C in Spreadsheet IR1.1 list the patient-level activity feeds required for costing.

15. 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 more accurately calculate costs for resources, eg fleet information feed.

16. Activity feeds can be grouped into two types to support the matching process. They are categorised in column G in Spreadsheet IR1.1:

- **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.

17. We specify five information feeds:

- feed 20: incident information – master feed
- feed 21: response unit information – auxiliary feed
- feed 22: patient information – auxiliary feed
- feed 23: staff information – supplementary feed
- feed 24: fleet information – supplementary feed.

18. Columns C and D in Spreadsheet IR1.2 describe the data fields required for each feed.

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

20. You are not required to collect duplicate information in the individual feeds unless this is needed for costing, matching or collection. For example, you do not need to have physical response stage activity data in the incident information feed. The reasons for including the fields in the information feeds are given in columns I to K in Spreadsheet IR1.2.

21. Your informatics department is best placed to obtain the data required from the most appropriate source. But to help you identify the information already being collected by your organisation, use Spreadsheet IR2.1.

Ambulance information requirements

22. This standard specifies what information to collect, not how to collect it. If you collect several of the specified feeds from one dataset, you should continue to do so, provided the required information is captured.

23. If you have activity in your data 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.

24. Note that the data tables and fields specified in this standard are neither reports that you need to produce nor a collection template. They specify the information you will need for costing.

What you need to implement this standard

- Costing principle 5: Good costing should focus on materiality[3]
- Spreadsheet IR1.1: Activity feeds required for costing
- Spreadsheet IR1.2: Field requirements for the activity feeds
- Spreadsheet IR1.3: Examples of feed data for different scenarios

Approach

25. This section describes each feed, explaining the relevant costing standard, collection source and feed scope.

26. The diagram in Spreadsheet IR1.4 explains the different levels of information we refer to, particularly call level, response level, incident level and patient level, in relation to the information feeds. See also Spreadsheets CM31.1 and CM31.2 for more details of the different levels of information recorded for incidents.

Feed 20: Incident information

Relevant costing standard

- Ambulance standard CM31: Allocating costs across job-cycle elements

[3] See *The costing principles*, https://improvement.nhs.uk/resources/approved-costing-guidance/

- Spreadsheet IR1.3: Examples of feed data for different scenarios[4]

Collection source

27. Activity data is collected from the call or another trigger (eg an ambulance passes 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 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.[5]

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[6] is usually collected at the call level – that is, one incident may be associated with more than one call – this version of the standards requires information only on the main call associated with the

[4] See scenario examples in Spreadsheet IR1.3 for how the incident feed (feed 20), response feed (feed 21) and patient feed (feed 22) link together and what specific data fields need to be populated in each scenario.

[5] See Ambulance standard CM31: Allocating costs across job cycle elements for details of job cycle stages.

[6] See Ambulance standard CM31: Allocating costs across job cycle elements for details of call stage activities.

incident[7] (ie at incident level). This is because duplicate calls associated with the same incident cannot be linked to the main call and the incident.[8]

32. Data on telephone clinical advice activities[9] is usually collected at the incident level. Data on giving telephone clinical advice to the crew at the scene is not required for this version of the standards.

33. 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 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.

34. 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 IR1.3: Examples of feed data for different scenarios[10]

Collection source

35. This data should come from your CAD system.

Feed scope

36. 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 (ie a job) from the time of allocation, including but not limited to travelling to the scene, treating patients at the scene and

[7] The main call is the call linked to the incident in your CAD system.
[8] This is based on feedback from the National Ambulance Information Group.
[9] See Ambulance standard CM31: Allocating costs across job cycle elements for details of call stage activities.
[10] See scenario examples in Spreadsheet IR1.3 for how the incident feed (feed 20), response feed (feed 21) and patient feed (feed 22) link together and what specific data fields need to be populated in each scenario.

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

37. This feed includes information on:

- timestamps 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.

38. This is an auxiliary feed that is matched to the incident feed (feed 1) using activity ID (incident ID) recorded in this feed, matching a response to an incident.

Feed 22: Patient information

Relevant costing standard

- Ambulance standard CP4: Matching costed activities to incidents and patients
- Spreadsheet IR1.3: Examples of feed data for different scenarios[11]

Collection source

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

Feed scope

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

41. This feed is not a patient activity feed – that is, it does not contain any information about patient-facing activities such as providing telephone clinical advice or treating patients at the scene. This feed is used to take incident-level costs to the patient level.

[11] See scenario examples in Spreadsheet IR1.3 for how the incident feed (feed 20), response feed (feed 21) and patient feed (feed 22) link together and what specific data fields need to be populated in each scenario.

Ambulance information requirements

42. 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)
    - activity type:
        - hear and treat/refer
        - see and treat/refer
        - see, treat and convey.

43. 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 batch-tracing service,[12] NHS Spine[13] or other services. In the technical document we provide codes to use when data is not available.

44. Note that for the patient-identifiable information, information governance issues should be covered by your organisation's own procedures, not these standards.

45. 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.[14] A patient record should be generated for each patient conveyed, even if the patient's details are not available: ie a proxy patient record needs to be generated.

46. This is an auxiliary feed and is matched to the incident feed (feed 20) using activity ID (incident ID) recorded in this feed, matching a patient to an incident.

47. It is also matched to the response feed (feed 21) using conveying response ID, which matches a patient to the response unit that conveys them.

[12] See https://digital.nhs.uk/media/31515/DBSB-NHS-Number-Batch-Tracing/doc/DBSB_-_NHS_Number_Batch_Tracing for technical details on batch tracing.
[13] See https://digital.nhs.uk/spine for details on Spine.
[14] See Ambulance standard CM31: Allocating costs across job cycle elements for details of how to allocate costs to multiple patients involved in an incident.

Ambulance information requirements

Feed 23: Staff information

Relevant costing standard

- Ambulance standard CM1: Allocating costs across job-cycle elements
- Ambulance standard CM3: Non-responding time

Collection source

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

Feed scope

49. All staff shifts and working hours within the costing period.

50. 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.

51. 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.

52. This feed includes information on:

    - shift start and end date and time
    - staff identifier
    - staff working hours
    - vehicle identifier.

53. This feed is linked[15] to the incident feed (feed 20) using staff ID for call-taking staff and clinicians who provide telephone clinical advice.

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

54. It is also linked to the response feed (feed 21) using staff ID for frontline staff.

Feed 24: Fleet information

Relevant costing standard

- Ambulance standard CM2: Fleet costs
- Ambulance standard CM3: Non-responding time

Collection source

55. 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.[16] Please follow guidance in Ambulance standard IR2: Managing information for costing to make the information available for costing.

Feed scope

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

57. The fleet information feed is a supplementary feed and 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.

58. 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).

[16] Feedback from the National Ambulance Information Group is that fleet management information is not available across all ambulance service providers.

Ambulance information requirements

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

60. This feed is linked to the response feed (feed 21) using vehicle ID.

Additional activity feeds and fields

61. If you already collect additional activity data, you are encouraged to continue to do so as this is best practice. Record these additional feeds in your ICAL worksheet 2: Additional information source.

62. If you use 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.

63. 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 activity, and future versions of the standards may require it for costing.

64. 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 activity feeds. Examples of such feeds are:

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

65. 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

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

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

- any costs incurred for it are not incorrectly allocated to 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
- income received is allocated to the correct activities.

Other data considerations

68. Information from specific fields of the patient-level feeds is required to enable cost allocation (see Spreadsheet CP3.3). These fields are flagged with an ‘X’ in column I in Spreadsheet IR1.2.

69. The activity feeds do not contain any income information. Your organisation may decide to include the income for the feeds at incident level.[17] The standards do refer to income when this helps the understanding of the costs and income for a particular service for local reporting and business intelligence.

70. The feed specifications in Spreadsheets IR1.1 and IR1.2 do not include description fields for codes used, eg organisation name for organisation code. You may 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.

[17] See Ambulance standard CM35: The income ledger for further information.

PLICS collection requirements

71. The master feed of incidents forms the basis of the cost collection. See the ambulance PLICS cost collection guidance for more details.[18]

[18] https://improvement.nhs.uk/resources/approved-costing-guidance-2019/

IR2: Managing information for costing

Purpose: To assess the availability of the information specified in Ambulance standard IR1: Collecting information for costing, and to recommend processes to manage this information.

Objectives

1. To explain how to use information in costing.

2. To explain how to support your organisation in improving data quality in information used 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 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. We consider these to be 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[19] 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. Use our information gap analysis template[20] to assess data availability for costing with your informatics colleagues and relevant services. Use Spreadsheet IR1.2 to inform these discussions.

10. Agree with informatics colleagues the format of information, frequency of activity feeds and any specific data quality checks for costing and 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.

11. Access locally held information for allocating type 1 support costs, such as headcount information for allocating HR costs.

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

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

What you need to implement this standard

- Costing principle 1: Good costing should focus on materiality
- Costing principle 4: Good costing should be based on high quality data that supports confidence in the results.[21]

[19] As specified in Ambulance standard IR1: Collecting information for costing.
[20] See the information gap analysis template, https://improvement.nhs.uk/resources/approved-costing-guidance-2019/
[21] See *The costing principles*, https://improvement.nhs.uk/resources/approved-costing-guidance/

Approach

Assessing the availability of information for costing

14. Here we provide guidance on assessing data availability. 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.

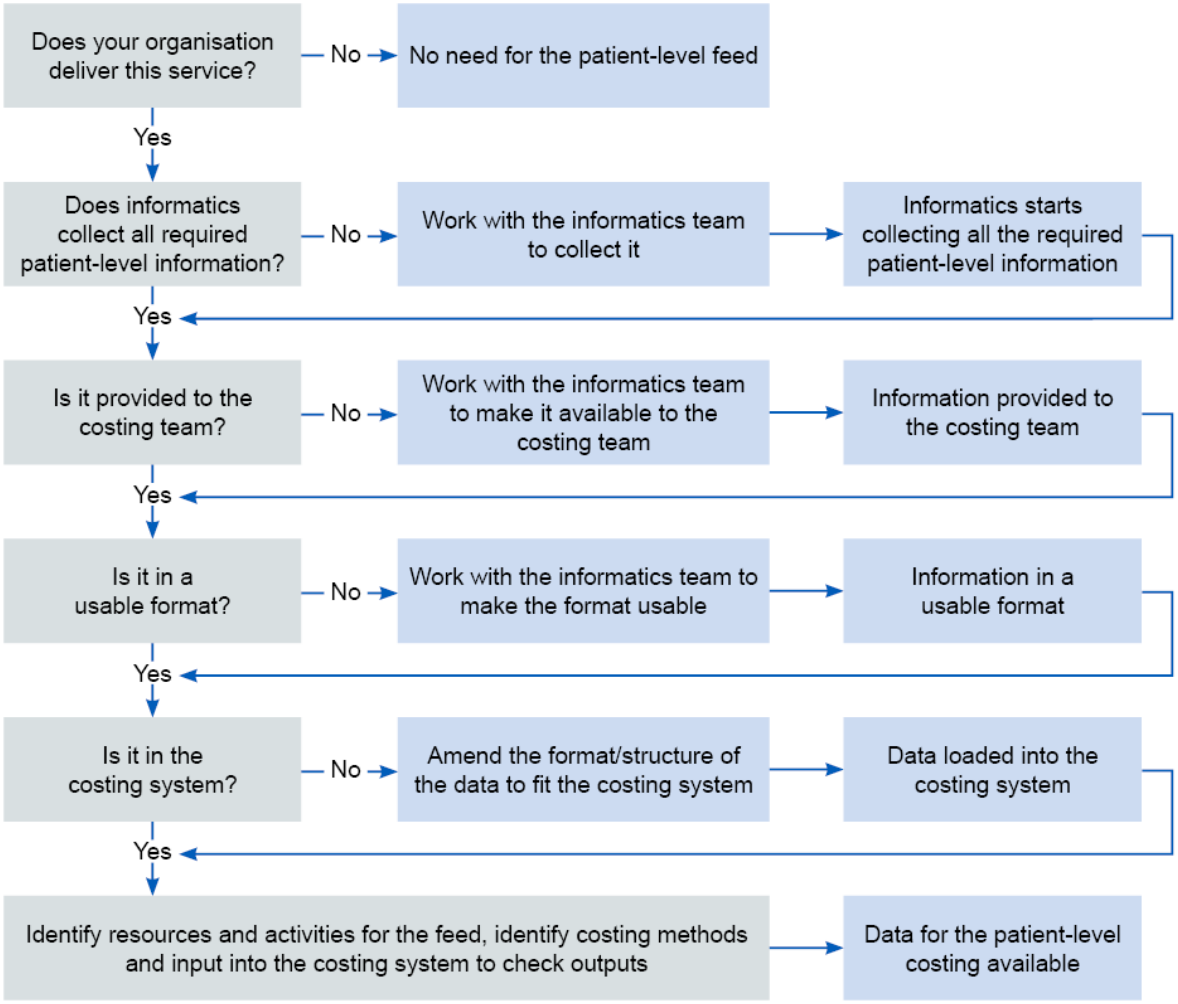
15. The quality of information varies between organisations. The specific data fields in each feed are given in Spreadsheet IR1.2. Their availability can be grouped as:

    - **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 asked of them 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 the development of the local systems at your organisation – 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. Use our information gap analysis template and work with your informatics colleagues and relevant services to assess data availability for costing. Use column M in Spreadsheet IR1.2 to inform these discussions.

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.

Ambulance information requirements

Data available from systems other than CAD

19. Payroll data should be available from an internal system such as the electronic staff record, and rota data should be available from an internal system such as the global rota system, to provide the information required for the staff information feed (feed 4).

20. If you do not currently collect shift data, you should work with your informatics department and the 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 your 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, the fleet information feed (feed 5) 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

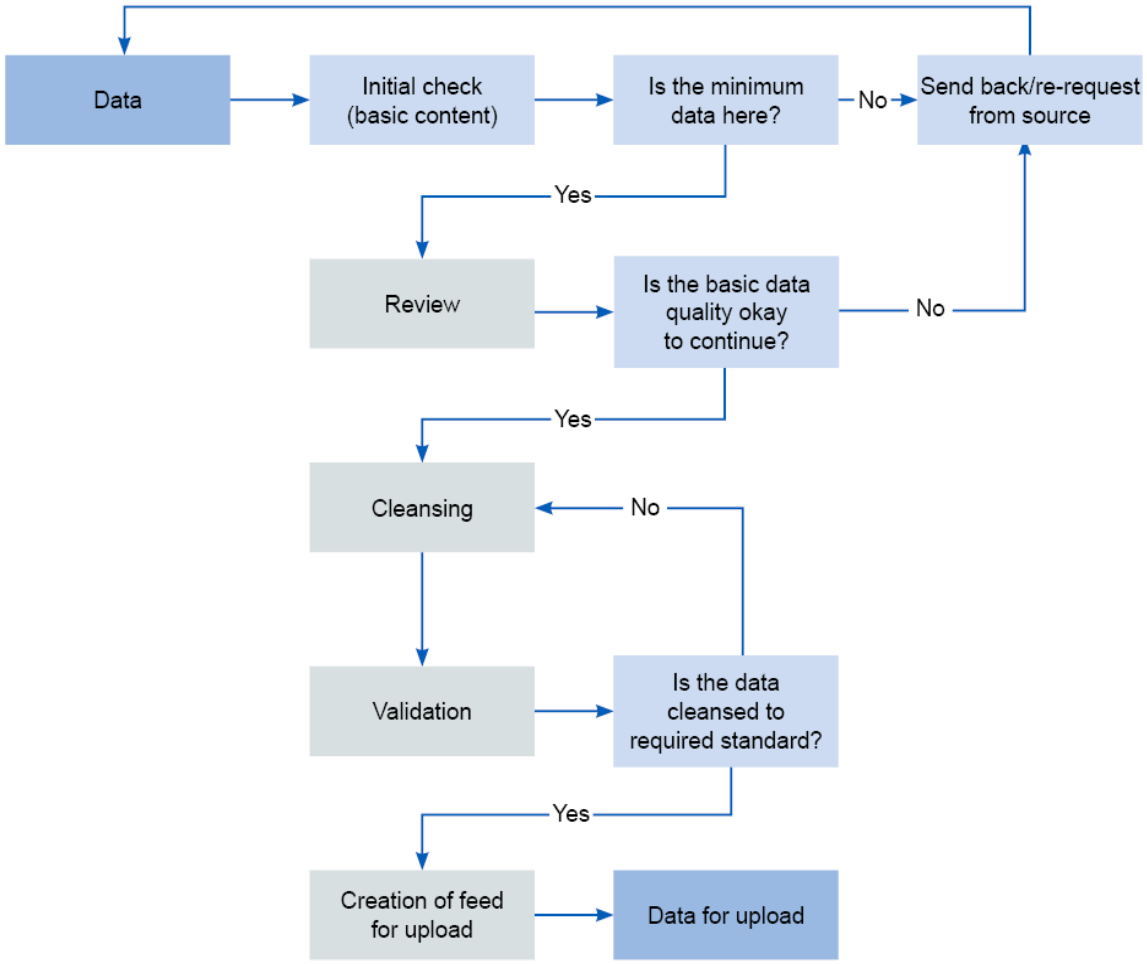
25. Providers complete a paper PRF for each patient they treat or convey. In some cases, multiple forms may be completed for the same patient – for example, when care switches between different frontline staff, or when a patient is observed over a long time.

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.

Ambulance information requirements

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 there is more than one call 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 future development of the standards.

Telephone clinical advice

31. There are two issues with the activity data on giving telephone clinical advice:

    - providers do not record time spent giving clinical advice to patients by telephone (ie hear and treat) in the same way; some record it separately from answering the call and triage, while others do not distinguish 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 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 future development of the standards.

Ambulance information requirements

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 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 timestamps for call handling and providing telephone advice to patients	Some providers do not distinguish between hear and treat and call-handling time.
Timestamps 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 call handlers are known often to make coding errors when recording numbers and the number reported by the caller is unlikely to be accurate. 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 and when it is, the data is not collected systematically.
Patient information (NHS number, age, gender, etc)	Missing values for a significant number of patients.

Ambulance information requirements

Unavailable items or items with varying availability	Issue
Clinical data beyond chief complaint	Main source is PRF, which is often available in paper format 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.[22]

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 CP5.2).

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 auxiliary and supplement feeds to those used in the master feeds to ensure the costing allocation methods (particularly

[22] The benefits of real-time data can be found at: www.gov.uk/government/publications/nhs-e-procurement-strategy

matching rules) are applied correctly. These should be reviewed in a rolling programme.

Refreshing the patient-level 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. You need to refresh the data because services will continue to record activity on systems after the official closing dates. Although these entries may be too late for payment purposes, they still need to be costed. The refreshed information picks up these late entries, which may be numerous.

47. Get a refresh of all the patient-level activity feeds:

    - six-monthly – refresh all the data feeds for the previous six months (April to September)[23]
    - annually – refresh all the data feeds for the previous financial year (April to March).

48. A challenge for costing teams is that changes as a result of the refreshes can alter the comparative 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 patient-level activity feed.

Using information in the costing system

49. If the costing system needs to calculate durations – eg 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.

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

Ambulance information requirements

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

Managing information feeds

51. You should keep a log of data feeds in your ICAL worksheets 1 to 7 for each entry 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 timestamp 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 timestamps 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.

Ambulance information requirements

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 data 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.

Ambulance information requirements

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.

Ambulance information requirements

65. If you are missing any of the required data fields in Spreadsheet IR1.2, you should 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: Role of the general ledger in costing

Purpose: To set out how the general ledger is used for costing, and to highlight the areas which 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.

Overview

3. You need the income and expenditure for costing. We refer to this as the 'general ledger output'. This output needs to be at cost centre and expense code level and is a snapshot of the general ledger. You do not require balance sheet items for costing.

4. You must include all expenditure and income in the general ledger output, and this must reconcile with the financial position reported by your board and in the final audited accounts.

5. The general ledger is closed at the end of the period, after which it cannot be revised.[24] For example, if in March you discover an error in 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 the January and March figures do not represent the true cost at those times, as

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

one will be overstated and the other understated. Check with the finance team to ensure any such changes are brought into the costing system.

6. 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 general ledger 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.

7. 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.

What you need to implement this standard

- Costing principle 2: Good costing should include all costs for an organisation and produce reliable and comparable results[25]
- Spreadsheet CP1.1: General ledger output required fields

Approach

Obtaining the general ledger output

8. The finance team should tell you when the general ledger 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, especially if they are included in your organisation's report of its financial position, as you will need to reconcile to this.

9. Keep a record of all these adjustments in your integrated costing assurance log (ICAL worksheet 11),[26] to reconcile back to the general ledger output. Take care to ensure that any manual adjustments are mapped to the correct line of the cost ledger.

[25] See *The costing principles*, https://improvement.nhs.uk/resources/approved-costing-guidance/
[26] 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.

Ambulance costing processes

10. See Spreadsheet CP1.1 for a list of what the extract from the general ledger output must include.

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

12. 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. One way to get this information is to circulate a general ledger changes form to all appropriate teams, including costing. Cross-team approval increases the different teams' understanding of how any changes affect them.

13. **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.

14. The new general ledger cost centres and expense codes need to be mapped to the cost ledger. You then need to reflect these changes in the costing system.

15. 'Dump'[27] 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 'dump' codes contain so that they are mapped to the correct lines of the cost ledger.

16. You should have a rolling programme to regularly meet your finance colleagues to review the general ledger and its role in costing.

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

CP2: Clearly identifiable costs

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

Objectives

1. To ensure all costs are in the correct starting position and are correctly labelled for the costing process.

2. To ensure the same costs are mapped to the same resources.

3. To ensure all costs are categorised in a consistent way.

4. To ensure income is not netted off against costs.

Scope

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

Overview

6. The general ledger is often set up to meet the provider's financial management needs rather than those of costing. Therefore, some of the costs it contains must be transferred to other ledger codes or aggregated or disaggregated in the cost ledger to ensure the costs are in the right starting position for costing.

Ambulance costing processes

7. Users of the national cost datasets say inconsistency in how costs are labelled limits meaningful analysis. For example, a recent analysis of orthopaedic cost data[28] found issues with inconsistent labelling of theatre consumables.

8. To ensure the accuracy of cost data, the costs at the beginning of the process need to be in the right place with the right label.

9. This is one of the reasons we have introduced a standardised cost ledger. It enables you to investigate the general ledger in depth to understand the costs it contains, and it provides a way to get the costs into the right starting position with the right label. This is important for application of the correct cost allocation method to the cost, and effective auditing of the process.

10. You should keep a record of your general ledger to cost ledger mapping. An example of the type of structure to use is in ICAL worksheet 9: GL to CL mapping.

Categorisation of costs

11. The standardised cost ledger also combines the cost centre and expense code into the costing account code.

12. The standardised cost ledger categorises costs at both the cost centre and expense code level, according to whether they are patient-facing or support:[29]

    - **Patient-facing costs** are those that relate directly to delivering patient care and are driven by patient activity. They should have a clear activity-based allocation method and will be both pay and non-pay. These costs use resources and activities in the costing process.
    - **Support costs** do not directly relate to delivering patient care. Many relate to running the organisation (eg board costs, HR, finance, estates). Other support costs may be service-level support costs such as service management costs.

[28] This analysis was undertaken by NHS Improvement's Group Advising on Pricing Improvement (GAPI) during 2017.
[29] Please see columns D and H in Spreadsheet CP2.1 for how cost centres and expense codes are categorised respectively.

Ambulance costing processes

13. To help the costing process, support costs have been categorised as type 1 and type 2:

    - **type 1** support costs such as finance and HR are allocated to all the services that used them, using a prescribed allocation method such as headcount or actual usage; these costs do not use resources and activities in the costing process
    - **type 2** support costs are allocated to the patient using an activity-based method, eg costs on Clinical Negligence Scheme for Trusts (CNST). These costs use resources and activities in the costing process.

14. The nature of the cost determines the categorisation, not the allocation method. The standards apply an activity-based allocation method to type 2 support costs, as this is believed to be a more accurate way to allocate the costs. However, the category of the cost is still a support cost. It does not change to a patient-facing category.

15. Some providers may have sophisticated data systems that allow you to allocate a type 1 support cost using an activity-based method, but this does not change the category of a type 1 support cost to a type 2 support cost.

16. For national reporting, all providers are expected to use the national PLICS terminology, as in the *Approved costing guidance glossary*. This includes the terminology used in Integrated standard CM15: Cost classification. We understand that providers also use other cost categorisations for local reporting. The standards do not provide guidance on categorisations not given in the costing glossary.

Income

17. To maintain transparency in the costing process, income should not be netted off from the costs. The only exceptions to this rule are:

    - Where 100% of an individual healthcare professional's costs are reported in your general ledger, but they spend part of their time at another organisation. The income received for this activity at another provider can be netted off the healthcare professional's pay costs to avoid inflating the cost of the provider's patient care activity at your organisation. It is important to determine whether the recharged value includes type 1 support

costs recovery, as netting this additional income off staff costs would understate the remaining resource cost.

- Where the materiality principle applies – for small value contracts or service-level agreements there is no need to determine the associated costs.

Salary recharges

18. These are described as ‘pay recharge to’ and ‘pay recharge from’ in the standardised cost ledger. Pay recharges are also categorised as clinical and non-clinical in the cost ledger.

19. In line with the first bullet in paragraph 16, a ‘pay recharge to’ is where you invoice another organisation for an element of someone’s salary, without including any service element for support costs or surplus (this may be included in the gross recharge). The income received needs to be netted off against their salary so that 100% cost is not attributed to, for example, 50% activity. The ‘pay recharge to’ needs to be moved to the cost ledger line for the individual and netted off, both for patient-facing and support resources.

20. The ‘pay charge from’ needs to be moved to the cost centre that is paying for the activity, so the pay costs can be allocated to the activity.

Commercial activities

21. Commercial activities for which there are costs and income, such as providing additional ambulance cover for commercial events, should be costed in line with Ambulance standard CP5: Reconciliation and reported under ‘other activities’.[30] This is so that a provider’s commercial activities do not inflate or deflate the its costs of patient care.

22. Where income is generated but costs are difficult to identify, such as car parking, you must make a sensible estimate after discussion with the appropriate teams. Report the costs and income under ‘other activities’. If you cannot identify the costs, report the income under the cost group ‘reconciliation items income’ as described in Ambulance standard CM34: The income ledger.

[30] For more information, please refer to Integrated standard CM8: Other activities.

Ambulance costing processes

Expenditure and activity recorded in different organisations

23. Where your organisation holds the budget and therefore the costs for a service, but you do not record the activity, report these costs under 'costs and income reconciliation items'. This includes both your organisation's own costs where there is no activity and costs incurred on another organisation's behalf – for example, an employee working for the air ambulance service.

24. If your organisation is taking part in a national programme – for example, Scan4Safety – and all expenditure is funded by the project, treat it as 'other activities' and report it under the 'other activities' cost group, until it becomes business as usual.

What you need to implement this standard

- Costing principle 2: Good costing should include all costs for an organisation and produce reliable and comparable results
- Costing principle 3: Good costing should show the relationship between activities and resources consumed
- Costing principle 4: Good costing should involve transparent processes that allow detailed analysis
- Costing principle 5: Good costing should focus on materiality[31]
- Spreadsheet CP2.1: Standardised cost ledger (with mapping to resources)
- Spreadsheet CP2.2: Type 1 support costs allocation methods

Approach

25. Before proceeding, review Spreadsheet: Costing diagram. This is a high level visual aid to the costing process described in the standards.

26. We describe the process in steps to help you understand it, but these steps may happen simultaneously in the costing system.

27. The initial setting up of your costing system is a one-off exercise, but the interface between your general ledger and the standardised cost ledger should be understood and reviewed regularly to keep it up to date. This

[31] See *The costing principles*, https://improvement.nhs.uk/resources/approved-costing-guidance/

regular process will also enable you to refine and improve the PLICS data over time.

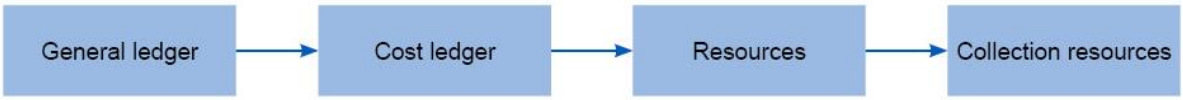
28. Various software solutions will deliver the process. We are not prescribing how they should do so.[32]

Setting up the cost categorisation in your costing system

29. The costing process described here is linear, with each element mapping to the next in a standardised and consistent way, as shown in Figure CP2.1:

    - analysing your general ledger and understanding how costs need to be disaggregated to ensure they are allocated properly, or where they need to be moved to ensure they have the right label and are in the right starting position
    - using the information from this analysis to inform the processing rules in your costing system
    - having the prepopulated cost ledger in your costing system; when you load your general ledger output to your costing system, these processing rules map it to the appropriate line in the cost ledger and thus the prescribed resources and collection resources.

Figure CP2.1: Mapping the costing process components



30. The mappings from:

    - the cost ledger account codes to the prescribed resources and
    - these resources to the prescribed collections resources

    are provided in columns J and P in Spreadsheet CP2.1, respectively.

31. The cost ledger, resources and collections resources – with their coding structure and the mapping between them – should be prepopulated in your

[32] Please refer to the minimum software requirements 2019.

costing system. If these mappings change, we will provide the information to update your costing systems.

32. You should be able to view the data and access reconciliation reports at each of the stages in Figure CP2.1 (see also Ambulance standard CP6: Assurance of costing data).

33. Depending on your costing system, costing may take place at a level lower than the prescribed resources (see Spreadsheet CP3.1). Your system may use cost items, local resources or another categorisation or grouping of costs. You can continue using any of these methods in your costing system but be aware that it adds an additional mapping exercise to your set-up.

34. The cost allocation methods prescribed in Spreadsheet CP3.1 take into account that costing may happen at a lower level than the resource prescribed.

35. In Figure CP2.1, the only mapping exercise you need to do is mapping your general ledger to the cost ledger as described below.

36. If you use a local resource in your costing process you must map your cost ledger to your local resources, then your local resources to the prescribed resources. You must document your mapping assumptions in ICAL worksheet 15: Superior costing methods.

37. The mapping process still needs to be linear to maintain standardisation and consistency. Figure CP2.2A below illustrates the mapping process with the additional component of a local resource.

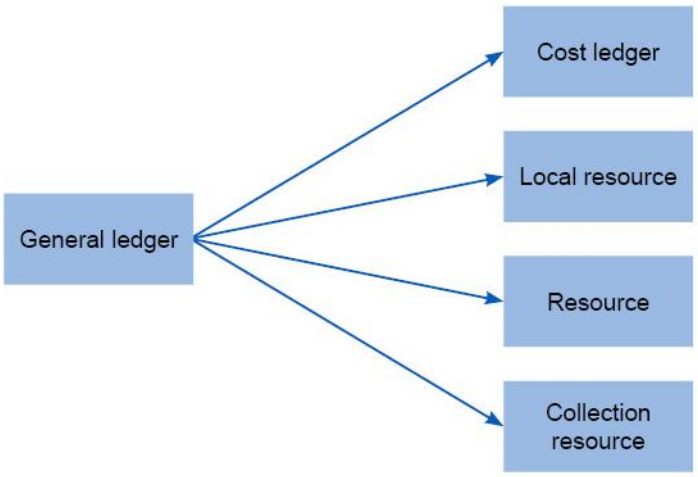
38. Do not treat these mapping exercises as separate entities. It is important to ensure that everyone puts the same costs in the same place, to maintain the linear mapping.

39. Figure CP2.2B is an example of how **not** to approach the mapping exercises.

Figure CP2.2: Linear mapping of the costing process components

A (✓)

B (✗)



Analyse your general ledger to get your costs in the starting position with the right label

40. For the cost data to be credible we need to ensure that everyone puts the same costs in the same place before the cost allocation begins.

41. To achieve this, you need to ensure all the costs recorded in your general ledger are in the right starting position and have the right label.

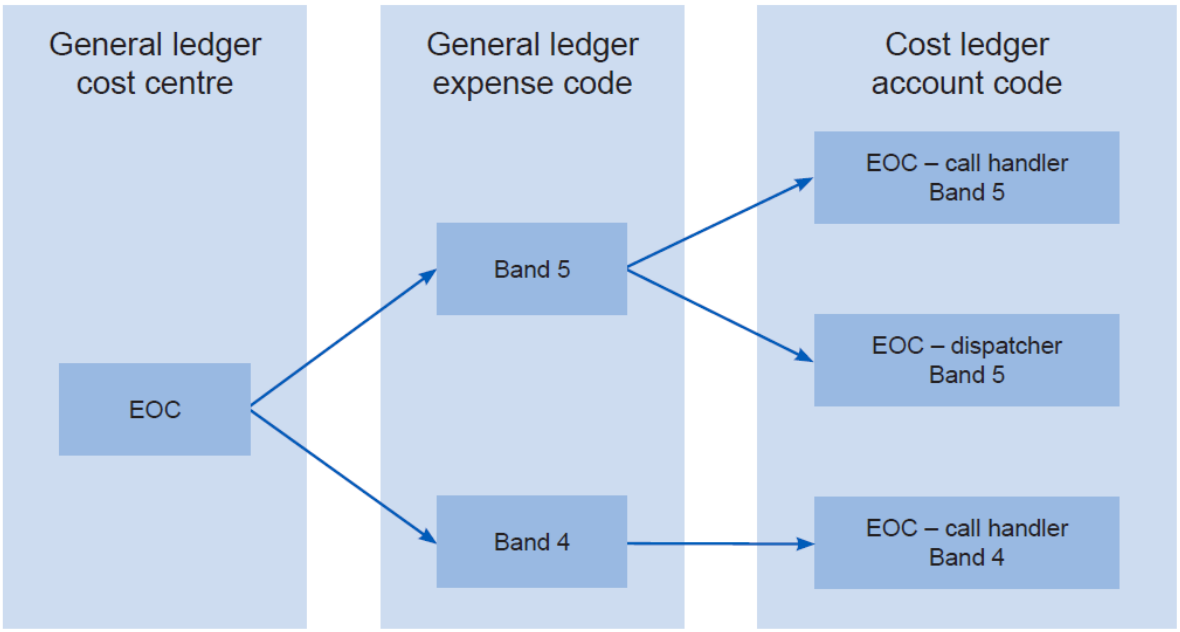
42. Use the standardised cost ledger template (Spreadsheet CP2.1) to map your general ledger to the cost ledger account codes to achieve this.

43. Analyse your general ledger to understand how costs are recorded in it and what steps you need to take to get the costs in the right starting position with the right label.

44. These steps will include disaggregating costs that need to be mapped to different resources, or where the labels used in the general ledger do not differentiate the costs recorded.

45. Figure CP2.3 gives an example of the disaggregation. You may have an emergency operations centre (EOC) cost centre in your general ledger, and on the expense line 'Band 5' you have call takers and dispatchers. The costs for the call takers and dispatchers must be disaggregated as they need to go to different resources. You can use relative weight values to determine the apportionment of costs between the two lines in the standardised cost ledger.

Figure CP2.3: Example of disaggregation between the general ledger and the cost ledger



46. Use the information from your in-depth investigation of your general ledger to inform the processing rules in your costing system. If your general ledger uses sub-analysis codes, you will need to map these codes to the correct line on the cost ledger.

47. To help prioritise what you analyse, use the general ledger to cost ledger auto-mapper application we provide.[33] This analyses the expense code descriptions in your general ledger output and matches them to the expense

[33] The general ledger to cost ledger auto-mapper application is available as part of the early implementer support package. If you have not volunteered to be an early implementer, the GL to CL auto-mapper application is available on request from costing@improvement.nhs.uk.

code descriptions in the standardised cost ledger in column E in Spreadsheet CP2.1.

48. Where the cost ledger auto-mapper application cannot identify an appropriate line in the cost ledger, you must analyse the general ledger line, identify what cost sits there and map it to the appropriate line in the cost ledger.

49. Columns I and J in Spreadsheet CP2.1 contain the mapping to the resources that, with the prescribed activity, identifies the prescribed cost allocation method to use. This ensures that everyone allocates the same cost in the same way: variations in activity costs will not be caused by variations in the costing process.

50. Use the information from your in-depth investigation of your general ledger to inform the processing rules for cost categorisation in your costing system.

51. You will not be able to analyse each line of the general ledger in depth the first time you do this exercise, but over time – with good communication between you and your finance colleagues – this can be refined. Start with where the largest costs are involved.

52. Although this mapping process is largely a one-off exercise, you need a rolling programme for analysing your general ledger over time to ensure that costs in the cost ledger continue to be in the right starting position with the right label. Review all mapping regularly, at least annually, to ensure all changes or additions to the general ledger are understood and included in the cost ledger.

Load your general ledger output into your costing system

53. The general ledger output must be transformed into the cost ledger **within the costing system** to ensure that changes can be traced and reconciled to the general ledger.[34]

54. You should populate the cost ledger template in your costing system. When you load your general ledger output into your costing system, it will use the

[34] If you are attempting to adopt the standards before purchasing a compliant software product, please ensure your mapping process is robust, transparent and documented. All PLICS costing software used in NHS organisations should comply with the minimum software requirements.

information from your analysis of the general ledger to map the costs against the appropriate cost centre and expense code in the cost ledger.

55. You will then have the right costs in the right starting position with the right label ready for the costing process to begin.

Allocate type 1 support costs to services that have used them

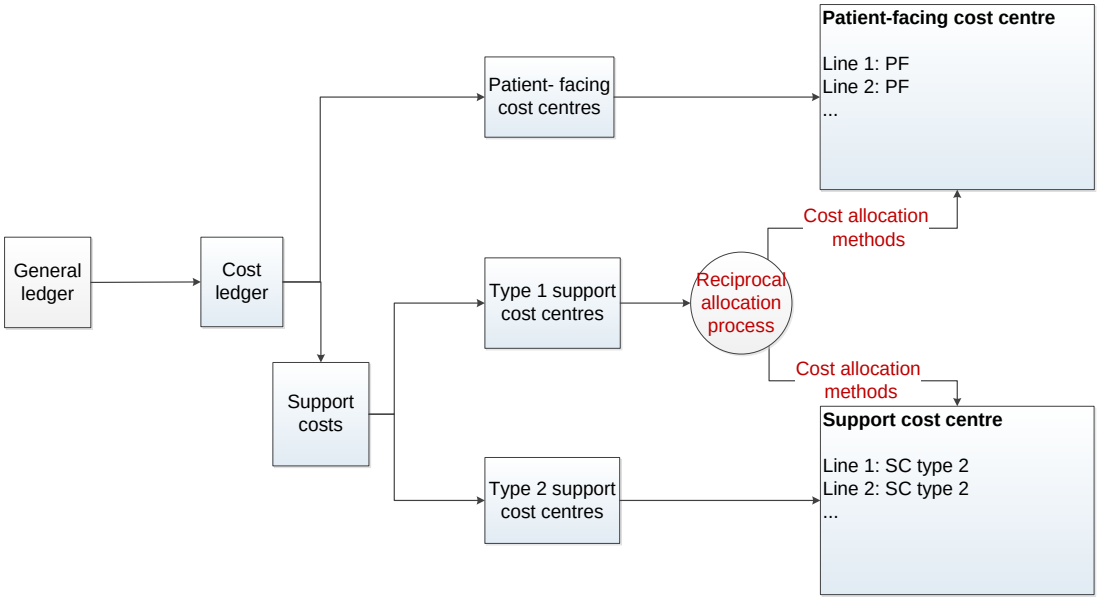
56. Once your costing system has received your general ledger output, it can process the data to allocate costs in type 1 support cost centres to:

    - the patient-facing costs
    - type 2 support costs
    - other type 1 support costs that have used them (eg finance using HR and vice versa).

    The process is illustrated in Figure CP2.4.

57. Where type 1 support costs have been devolved to, or are to be allocated to, another type 1 support cost centre (eg finance to HR and vice versa), a reciprocal allocation process takes place to allocate these type 1 support costs between each other.

Figure CP2.4: Extract from the costing diagram in the technical document



Ambulance costing processes

58. All type 1 support costs have been mapped to type 1 support cost titles in columns L and M in Spreadsheet CP2.1.

59. Each type 1 support cost title identifies the cost allocation method to use for this type 1 support cost in Spreadsheet CP2.2.

60. The standards prescribe a two-step process for allocating type 1 support costs:

    - Step 1: apportioning centrally held type 1 support costs to other cost centres that use them
    - Step 2: getting those type1 support costs into the right place in the patient-facing or support type 2 cost centre to be mapped to the resources for the costing process to start.

61. You need to identify whether a type 1 support cost is centrally held or has already been devolved to the relevant cost centres in the cost ledger. For example, are the computer hardware costs for geographical areas:

    - held in a 'central' place in your cost ledger (central)
    - purchased to a central code, but then recharged monthly to the service that used them (devolved)
    - in the cost centre of the geographical area to begin with (devolved).

62. Spreadsheet CP2.2 prescribes the allocation methods to be used for each type 1 support cost based on whether the cost:

    - is held centrally
    - has already been devolved to the cost centre that used them, using the prescribed method or a superior method
    - has already been devolved to the cost centre that used them, but not using the prescribed methods or a superior method.

Centrally held type 1 support costs

63. The cost allocation methods prescribed for centrally held type 1 support costs are given in Step 1 in column F in Spreadsheet CP2.2.

64. For cost centres of non-999 services, such as NHS 111 service cost centres, follow the methods specified in Spreadsheet CP2.2 to allocate centrally held type 1 support costs: for example, use budgeted head count to allocate HR cost to both 999 service and NHS 111 service. This is to ensure consistent support cost allocation across all service lines.

65. If the type 1 support cost has already been devolved in the cost ledger in Spreadsheet CP2.1 using the prescribed method or a superior method, you do not need to do Step 1 in Spreadsheet CP2.2.

Devolved type 1 support costs

66. Some type 1 support costs will have already been reported in patient-facing cost centres and type 2 support cost centres – eg stationery – and therefore do not need to be moved.

67. Other type 1 support costs – such as station security – may have already been devolved in the general ledger, based on an internal recharge. There is no need to repeat this step for these costs, providing the prescribed costing allocation method has been used.

68. For type 1 support costs that are devolved but not using the prescribed method nor a superior method, move them back to the central type 1 cost centre and reallocate them using the prescribed method.

69. Here is an example of treating devolved medical equipment depreciation costs (support cost ID: T1S023). The prescribed allocation method is 'value of equipment in the area as reported in fixed asset register' (see Spreadsheet CP2.2).

    - Where the cost has already been devolved to the station cost centres that use the equipment by using the prescribed allocation method, it is already in the correct position to be allocated to the patient-facing expenses lines within the cost centre. It does not need to be reaggregated to a central depreciation cost centre.
    - If the depreciation has been allocated by any other method, the cost should be reaggregated to the central depreciation cost centre, so that the prescribed allocation method can be used to allocate the cost to the station cost centres.

Ambulance costing processes

Reciprocal costing

70. This step includes the reallocation of type 1 support costs between the type 1 support cost centres. Do this using a **reciprocal** allocation method to allow all corporate support service costs to be allocated to, and received from, other corporate support services.

71. Reciprocal costing must take place **within the costing system**.

72. Type 1 support costs should **not** be allocated using a hierarchical method as this only allows corporate support services costs to be allocated in one direction.

73. A reciprocal allocation method accurately reflects the interactions between support departments, and therefore provides more accurate full-cost results than a hierarchical approach.

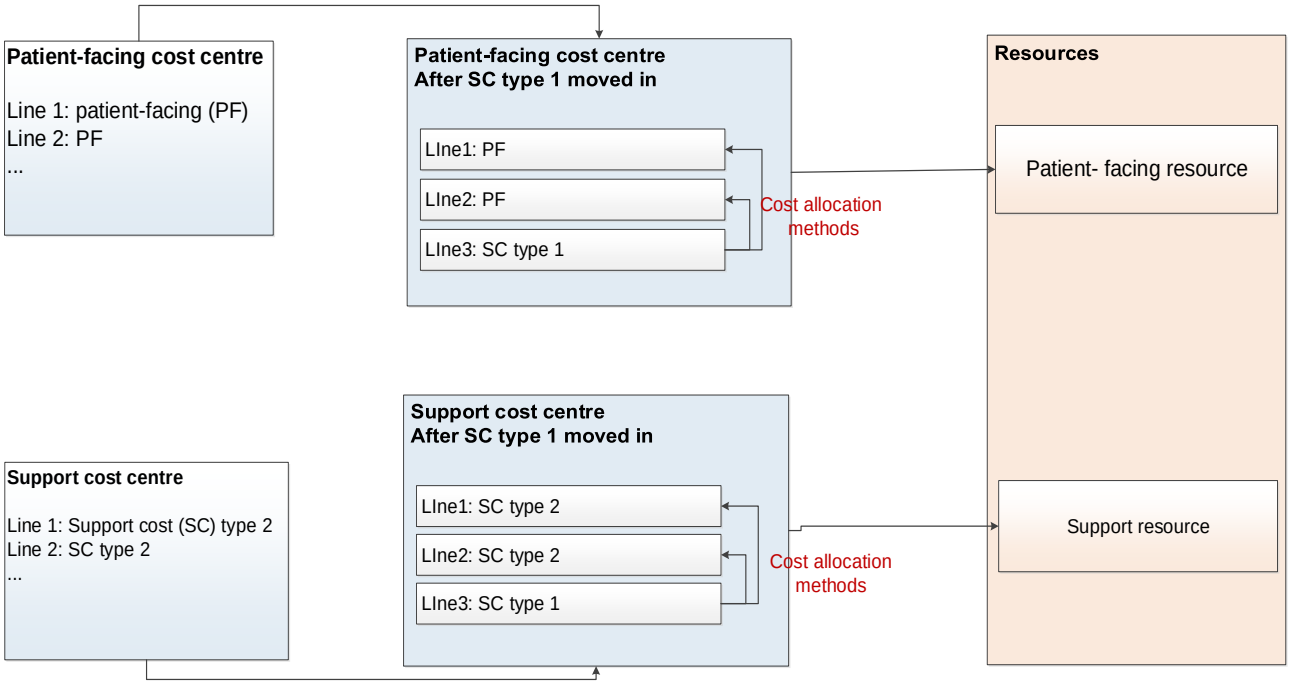
Superior allocation methods for type 1 costs

74. If you are using a type 2 support cost allocation method (that is, an activity-based method) to allocate a type 1 support cost, continue to do this and document it in ICAL worksheet 15: Superior costing methods. We have adopted this as a superior method.

75. The prescribed allocation methods (see Spreadsheet CP2.2), in most cases, do not include a weighting for acuity or intensity. If you are using a weighting for acuity or intensity with the prescribed allocation method, continue to do this and record it in your costing assurance log (ICAL worksheet 15: Superior costing methods). We have adopted this as a superior method.

Apportioning type 1 support cost in patient-facing and type 2 support cost centres

Figure CP2.5: Extract from the costing diagram in the technical document



76. The type 1 support costs within patient-facing or type 2 support cost centres include:

    - costs moved in from a central type 1 cost centre, eg HR cost moved in from the HR cost centre (cost centre: XXX204)
    - costs already devolved in the patient-facing or type 2 support cost centre, eg staff advertising and recruitment (expense code: 7159).

77. Within the costing system, apportion type 1 support costs over the patient-facing and type 2 support expense lines in the same cost centre, based on the allocation methods in columns F and G of Spreadsheet CP2.2.

78. Patient-facing costs and type 2 support costs, with their allocated portion of type 1 support costs, are then mapped to resources. Table CP2.1 below shows an example of this.

Table CP2.1: Example of costs within a patient-facing resource

Resource name	Patient-facing cost	Type 1 support cost	Total resource cost for the costing process
Frontline staff	XX	XX	XX
Fleet maintenance and repairs – Internal	XX	XX	XX

How to treat type 1 support costs in type 2 cost centres

79. All type 1 support costs in type 2 support cost centres will have been mapped directly to the type 2 support resources.

80. This is because each type 2 support cost centre maps to a single type 2 support resource, and therefore all cost lines within the cost centre are allocated to activities using the same allocation method.

81. It is not necessary to, within a type 2 support cost centre, allocate type 1 costs over the type 2 expense lines before mapping all the expense lines of the cost centre to a type 2 support resource.

82. However, we must emphasise that the information in Table CP2.1 still needs to be available if you allocate type 1 support costs in type 2 support cost centres directly to the support cost resource.

How to treat type 1 support costs in patient-facing cost centres

83. Allocate the type 1 support costs over the individual patient-facing expense lines within the same cost centre using the prescribed allocation methods in column F of Spreadsheet CP2.2. This step will absorb type 1 support costs into patient-facing and type 1 support costs.

84. You can map type 1 support costs directly to patient-facing resources – that is, there is no need to allocate type 1 support costs over the patient-facing expense lines if:

    - all the lines in the patient-facing cost centre map to the same resource

- you are using an average unit cost (eg average cost per minute) to allocate that resource.

85. Taking an extra step of allocating type 1 costs over the patient-facing expense lines will not produce a different result, so is unnecessary.

86. However, we must emphasise that the information in Table CP2.1 still needs to be available if you allocate type 1 support costs in patient-facing cost centres directly to the patient-facing resource.

87. Where the standards state you should allocate the actual staffing costs to their named activity, you still need to allocate the type 1 support costs over the patient-facing expense lines even if all the costs in the cost centre are mapped to a single resource; if you do not, individual staff members will not be allocated their correct amount of type 1 support costs.

Things to consider when following this method

88. Using an expenditure-based allocation method, some areas of the ledger may get a larger proportion of the allocated type 1 support costs because of specific high cost items, such as specialist staff members. If so, investigate the type 1 support cost allocation and use a more appropriate method.

Other considerations

Negative costs in the cost ledger

89. Negative costs arise for various reasons, such as a journal moving more cost than is in the expense code. Include all costs, both negative and positive, in the costing process to enable a full reconciliation to your organisation's accounts.

90. With the wider finance team, you must consider the materiality of each cost centre's negative costs and expense code combination. 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. 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?[35]

91. With the wider finance team, you need to investigate why any negative cost balances have arisen. Several issues can cause negative values in the general ledger to be carried into the cost ledger. With suggested solutions, these are:

- **Miscoding:** actual expenditure and accruals costs are not matched to the correct cost centre and expense code. Ideally, the responsible finance team rectifies such anomalies to give you a clean general ledger output; if not, you should make these adjustments in the cost ledger.
- **Value of journal exceeds value in the cost centre:** if the value transferred from the cost centre exceeds the value in the cost centre, this will create a negative cost. Again ideally, the responsible finance team rectifies such anomalies but if not, you should make these adjustments in the cost ledger.
- **Timing of accrual release:** an accrual release from a prior period can result in a negative cost value. When this happens, you must consider whether the negative cost is material and whether its timing creates an issue. You may need to report some negative costs caused by timing issues as a reconciliation item.

92. Negative costs can be an issue because of **traceable costs**. If a particular cost per unit is known and allocated to an activity rather than used as a relative weight value, and the total 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.

93. 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 a relative weight value will distort the final patient unit cost. If you do use the actual cost, you must ensure by doing this you do not create a negative value in the cost ledger.

[35] If the answer to this question is yes, the negative value may be a 'profit' element to the service provided. If material, this profit should be treated as a reconciliation item.

94. Negative costs may also be found in the cost ledger if, during the required ledger movements, more cost is moved than is actually in the expense code. To avoid this, use relative weight value or percentages to move costs rather than actual values.

Assurance of costing processes

95. It is essential to ensure the costing system reconciles at this stage, otherwise further steps will not reconcile and may prove more complex to unravel. Refer to Ambulance standard CP5: Reconciliation and Ambulance standard CP6: Assurance of costing processes.

PLICS collection requirements

Netting off other operating income

96. For the ambulance PLICS cost collection, other operating income must be netted off from the patient care costs (ie other operating income is not included in the total costs collected). This includes education and training and research income. Non-patient care costs must be allocated to patient care activity using the standardised allocation methods or appropriate local allocation rules. See the *Ambulance cost collection guidance 2019* for more information.

Support costs

97. Type 1 and type 2 support costs for the PLICS cost collection must be mapped to the support cost collection resource and reported in the PLICS collection extract. See Spreadsheet CP2.1 for the collection resource mapping. If you have any questions, contact costing@improvement.nhs.uk.

CP3: Appropriate cost allocation methods

Purpose: To ensure that the correct quantum of costs is allocated to the correct activity using the most appropriate costing 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 an appropriate information source.

4. To ensure relative weight values 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.

Ambulance costing processes

8. 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 a relative weight value for acuity or intensity. If you are using a relative weight value for acuity or intensity with the prescribed allocation method, continue to do this and record it in your integrated costing assurance log (ICAL) worksheet 15: Superior costing methods.

What you need to implement this standard

- Costing principle 2: Good costing should include all costs for an organisation and produce reliable and comparable results
- Costing principle 5: Good costing should focus on materiality
- Costing principle 6: Good costing should be consistent across services, enabling cost comparison within and across organisations[36]
- Spreadsheet CP3.1: Resources for patient-facing and type 2 support costs
- Spreadsheet CP3.2: Activities
- Spreadsheet CP3.3: Allocation methods to allocate patient-facing and type 2 support resources, first to activities then to incidents and finally to patients

Approach

Resources

10. Resources are what the provider purchases to help deliver the service. A resource may be a care provider, equipment or a consumable.

[36] See *The costing principles*, https://improvement.nhs.uk/resources/approved-costing-guidance/

Ambulance costing processes

11. This standard prescribes a list of resources to be used for the costing process. Resources are categorised as either patient-facing or support type 2 (see column E in Spreadsheet CP3.1).

12. In the standardised cost ledger (see Spreadsheet CP2.1) all patient-facing and type 2 support 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 list of resources (see Spreadsheet CP3.1) used by your organisation.

13. The costs within a resource may have different information sources and cost drivers. For example, the patient-facing frontline staff resource could include the costs of frontline staff salaries and type 1 support costs such as operational manager costs, station non-pay costs, HR and finance costs.

14. 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.

15. 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

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

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

Ambulance costing processes

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

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

18. This standard prescribes a list of activities for ambulance services (see Spreadsheet CP3.2). Activities are categorised either as patient-facing or type 2 support activities.

19. You need to identify all the activities your organisation performs from the prescribed list of patient-facing and type 2 support activities in column B in Spreadsheet CP3.2.

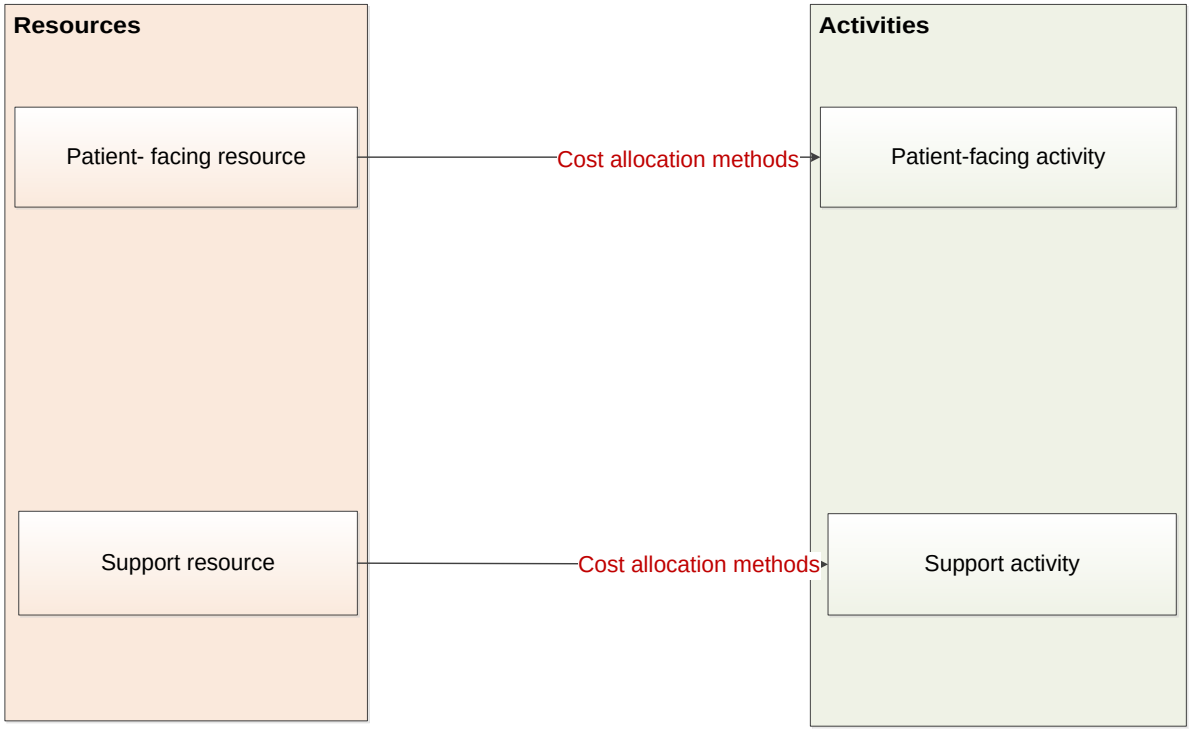
20. Some activities are informed by activity feeds: for example, the activity **mobile to scene (activity ID: AMA183)** uses information from the response feed (feed 2) for costing.

21. Some activities use other information sources for costing: for example, the activity **CNST indemnity (SPA149)** requires the Clinical Negligence Scheme for Trusts (CNST) schedule to allocate the resources correctly.

22. Column F in Spreadsheet CP3.2 describes whether the information source is one of the prescribed information feeds or another information source.

Allocate resources to activities

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



23. Only costs that have an activity-based cost allocation method are assigned a resource and activity from the prescribed lists (see Spreadsheet CP3.3).

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

25. 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 general ledger to the cost ledger (see Ambulance standard CP2: Clearly identifiable costs and paragraph 11 of this standard)

    - identifying the list of activities performed by your organisation from the prescribed list (see paragraph 19 of this standard).

26. You can ignore the resource and activity combinations in the technical document for activities your organisation does not provide.

Ambulance costing processes

27. You must allocate your resources to the activities using the methods prescribed in column D of Spreadsheet CP3.3.

28. Resources need to be allocated to activities in the correct proportion. There are three ways to do this:

    - based on actual time, data items or costs[37] from the relevant information feed prescribed
    - using relative weight values[38] created in partnership with the relevant departments
    - using a local information source.

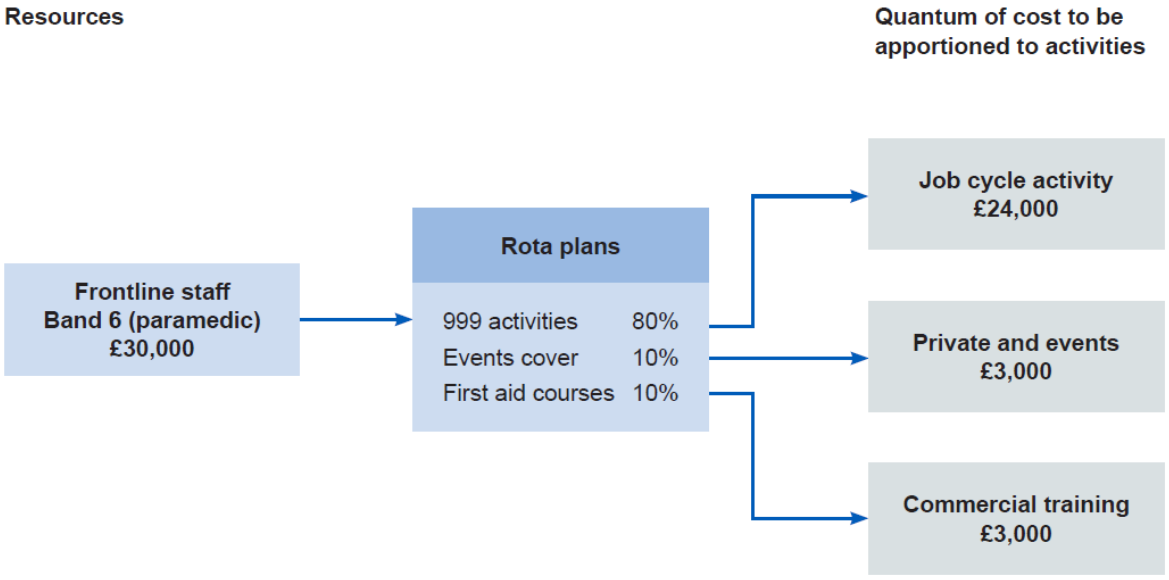
29. Where one resource needs to be apportioned to several activities, you need to determine the percentage of the cost to apportion to each activity after discussions with clinicians and managers, supported by documented evidence where available (eg paramedic rota plans). These splits and their basis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

30. One way to do this is to disaggregate the expense lines 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.

31. Note that frontline staffing resources do **not** need to be apportioned to each job cycle activity[39] as this is done when allocating resources to activities – ie apportioning and allocating resources happens in one step (see Ambulance standard CM1: Allocating costs across job cycle elements).

[37] The costs should be used as a weighting rather than a fixed cost.
[38] 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 at a patient event.
[39] 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



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

33. Use a relative weight value unless there is a local reason for applying a fixed cost.

34. 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 calculations in your costing system to reduce calculation time. For example, if numerous costs on treating patients at the scene use the driver duration of the activity, you can add them together for the cost calculation.

35. If you have a more sophisticated cost allocation method for allocating patient-facing or type 2 support resources to activities:

    - keep using it
    - document it in your ICAL worksheet 15: Superior costing methods
    - tell us about it.

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

37. 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 for relative weight values to be used in the costing process, such as fleet repairs and maintenance costs in the fleet information feed (feed 5).

38. Investigate any costs not driven to an activity or any activities performed by your organisation that have not received a cost and correct this.

Relative weight values

39. Relative weight values are values or statistics used to allocate costs to a patient event in proportion to the total cost incurred.

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

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

42. Relative weight values are used to allocate costs when other drivers are not available or appropriate. They must be developed and agreed with the relevant service managers and clinicians to ascertain all aspects of the costs involved and ensure these are as accurate as possible.

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

44. You should allocate all costs to patients based on actual usage or consumption. Where you cannot do this, you should use a relative weight value to allocate costs to a patient.

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

Relative weight values for type 1 support costs

46. To allocate type 1 support costs in the correct proportion, relative weight values may need to be identified by obtaining the relevant information from the departments.

Ambulance costing processes

47. An example of a statistic allocation table for the relative weight value of staff budgeted headcount is given in Table CP3.2; this could be further weighted to derive a relative weight value.

48. You may add additional information to weight a relative value even further. For example, you may add cleaning rotas or location weighting to floor area for cleaning so fleet workshops get a greater proportion of cleaning costs than station corridors. If you do this, continue to do it and document it in your costing model.

Table CP3.2: Budgeted headcount statistic allocation table

Department	Budgeted headcount
Emergency operations control centre	40
Stations (relevant subset)	30
Headquarters reception	5
Human resources	15
Finance office	10
Total	100

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.

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.

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 first to match costed activities to the incident and then link these to the patient.

8. Matching costed activities to incidents can be done in either of these two approaches:

   - for activities informed by an activity feed, use the matching fields in the activity feeds (see column F 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[40] and some call-stage activities[41] to incidents takes place before the costing process – it is done in your computer aided dispatch (CAD) system (see Ambulance standard IR1: Collecting information for costing). Therefore, there is no need to repeat this step to match these activities in the costing process.

10. Linking costed incidents to patient(s) can be done in either of the two approaches below depending 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

[40] Including activities: allocation to mobile, mobile to scene, time on scene, convey patients to treatment locations, patient handover and handover to clear.
[41] 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.

What you need to implement this standard

- Spreadsheet CP3.3: Allocation methods to allocate resources, first to activities then to incidents and finally to patients
- Ambulance standard IR1: Collecting information for costing
- Ambulance standard IR2: Managing information for costing
- Ambulance standard CM1: Allocating costs across job cycle elements

Approach

Matching costed activities to the incident

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

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

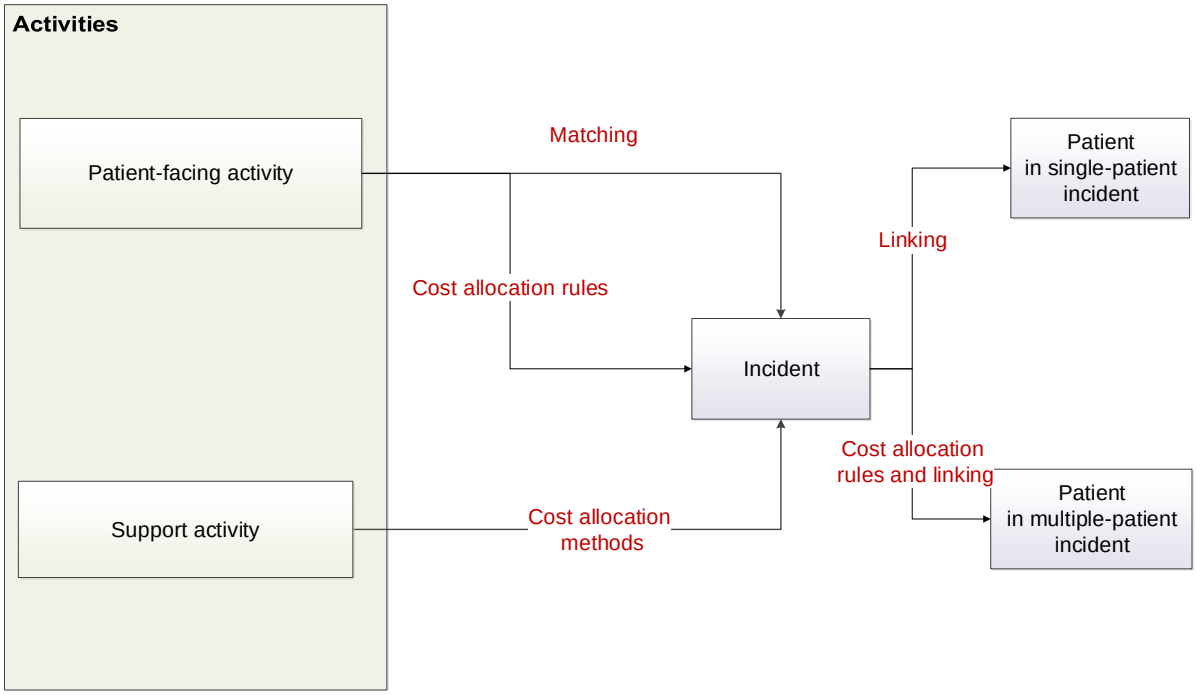
    Please refer to Spreadsheet CP3.3 for details of the matching and allocation rules.

14. The prescribed matching fields ensure the relevant auxiliary data 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 data 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).

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



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 E in Spreadsheet 3.3 for details).

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 these activities, as well as type 2 support activities, you should follow the cost allocation rules and methods prescribed in column E (Step 2) in Spreadsheet CP3.3 to allocate the costs to an incident.

20. 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

21. Depending on whether an incident involves one patient or more than one patient, the linking process to patient(s) is different.

22. Use **number of vehicles arriving at the treatment location** in the incident feed (feed 20) 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 multiple-patient incident. See Ambulance standard CM31: Allocating costs across job cycle elements and Ambulance standard IR2: Managing information for costing, for reasons why the proxy is used.

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

23. The vast majority of incidents are single-patient incidents.[42] After matching the costed activities to these single-patient incidents, you should have the patient unit cost.

24. 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 your patient information feed (feed 22).

25. 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**.

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

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

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

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

- 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.

Producing patient-level costs

28. 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.

29. Use the cost allocation rules prescribed in column F (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

30. 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 your patient information feed (feed 22).

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

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

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

Other considerations

34. The accuracy with which costed activities are matched depends on the quality of both the master feeds and the auxiliary feeds. Follow the guidance in Ambulance standard IR2: Managing information for costing to help your organisation improve its data quality.

35. 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 your ICAL worksheet 15.

36. 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

37. 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.

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

39. 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.

PLICS collection requirements

40. For the PLICS collection, costs should be aggregated at incident level.

41. Patient information needs to be submitted.

Ambulance costing processes

42. Unmatched cost should not be reported separately. All unmatched costs should be allocated to incidents using matched activity. See the Ambulance PLICS cost collection guidance 2019 for more information.[43]

[43] https://improvement.nhs.uk/resources/approved-costing-guidance-2019/

CP5: Reconciliation

Purpose: 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 outputs of the costing process 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.

What you need to implement this standard

- Costing principle 2: Good costing should include all costs for an organisation and produce reliable and comparable results
- Costing principle 4: Good costing should involve transparent processes that allow detailed analysis[44]
- Spreadsheet CP5.1: Cost and income reconciliation reports

[44] See *The costing principles*, https://improvement.nhs.uk/resources/approved-costing-guidance/

- Spreadsheet CP5.2: Activity reconciliation reports

Approach

Reconciliation of costs and income

5. The costs and income outputs must reconcile to the main sources of this information, the general ledger output and the organisation's reported financial position.[45]

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

7. 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 CP5.1.

Table CP5.1: 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 reconcilaiton items	Includes: • costs for which there is no corresponding activity, such as a frontline staff member who is employed by a provider to

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

Cost group	Description
	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

8. Cost and activity reconciliation items have these benefits:

   - patient unit costs reflect the true cost of treatment, undistorted by provider-incurred costs that are not patient-related
   - the true cost is more appropriate for benchmarking between providers as non patient-related costs can significantly affect cost reporting by different providers.

Reconciliation of activity

9. 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.

10. 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.

11. To demonstrate that the costing system's outputs reconcile to the main sources of activity information, the activity reconciliation reports detailed in Spreadsheet CP5.2 must be available from your costing system.

12. 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.

13. 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'.

Ambulance costing processes

14. 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.

PLICS collection requirements

15. For collection, the provider's PLICS quantum must reconcile to its final audited accounts. See the ambulance PLICS cost collection guidance 2019 for more information.[46]

[46] https://improvement.nhs.uk/resources/approved-costing-guidance-2019/

CP6: Assurance of cost data

Purpose: To ensure providers develop and maintain high quality assurance for costing and collection purposes.

Objective

1. To provide assurance that:

   - providers have implemented the standards and collections guidance properly
   - the costing principles have been applied in the costing process and outputs
   - providers are maintaining a clear audit trail of the costing and collection process
   - processes are adequate to validate the accuracy of submitted data in line with the Approved Costing Guidance
   - patient pathways and cost data have been clinically reviewed.

Scope

2. This standard relates to all costing processes and outputs produced by the provider.

Overview

3. There are several ways to provide assurance on the costing and collection process, including:

   - formal audit of process and submission by the providers' internal and external auditors

- evidence demonstrating:
  - compliance with the standards and associated guidance
  - users' review of cost data
  - use of the cost information to support decision-making (eg cost improvement plans, returns to regulators, local prices)
  - minutes of regular user/working group meetings.

4. The assurance process should be integral to producing cost information. Producing an audit trail, covering assumptions, decisions and reviews should be part of the process. This will enable the organisation to show it has adequate processes for ensuring the accuracy of cost information, both to internal and external users.

5. Many stakeholders require assurance:

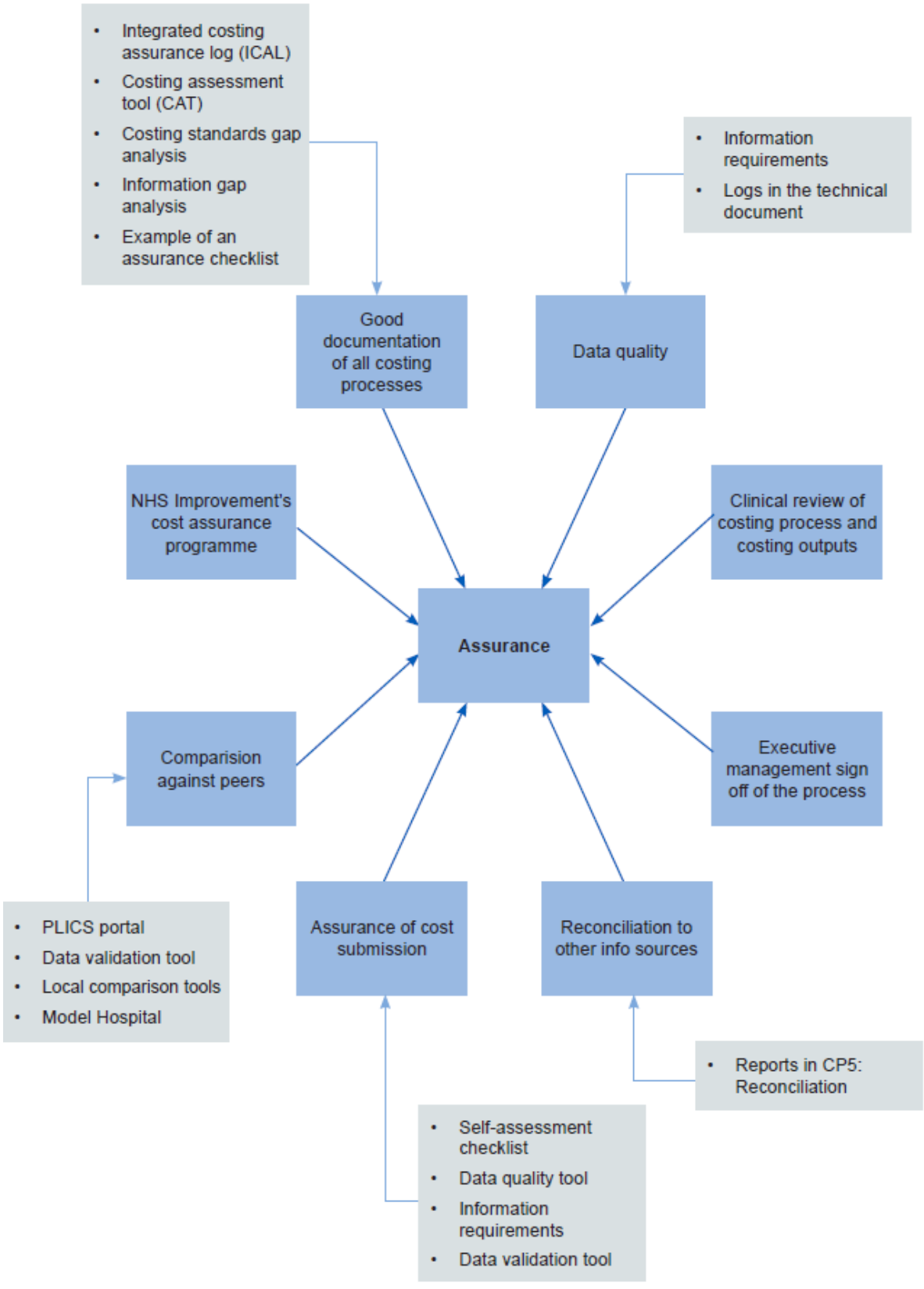
   - the executive team in its strategic decision-making
   - clinicians and their operational managers in analysing activities and clinical procedures
   - external stakeholders, who may make varied use of the information.

6. The level of evidence should be sufficient to support the reason for making the change. It will also allow updates and changes to be made to the costing processes and can be linked to the costing assurance log, showing why processes have been changed. This will support the assurance process for the board when submitting the costing submission. It can also help identify areas where costing needs to be improved, based on recommendations from findings that could not be completed in time for the submission.

7. We provide several tools to help you develop and maintain an assurance process that will promote continued improvement of costing in your organisation. Figure CP6.1 below shows examples of these.

Ambulance costing processes

Figure CP6.1: Assurance tools



Ambulance costing processes

What you need to implement this standard

- Costing principle 4: Good costing should involve transparent processes that allow detailed analysis
- Costing principle 7: Good costing should engage clinical and non-clinical stakeholders and encourage use of costing information[47]
- Standards gap analysis template (SGAT)
- Information gap analysis template (IGAT)
- Costing assessment tool (CAT)
- Data validation tool
- Data quality tool
- Access to the NHS Improvement's PLICS portal
- Integrated costing assurance log (ICAL) template

Approach

Documenting costing processes

8. You should use our tools to document your organisation's costing processes.[48] In particular:

   - The **ICAL template** helps document compliance with the standards. It will record where local adjustments have been made and the reasons why. It will also ensure the organisation retains costing knowledge and expertise when costing practitioners change.
   - The **SGAT** summarises the costing process standards (CPs) and the costing methods (CMs) to help your organisation plan and prioritise implementing the standards.
   - The **IGAT** helps assess the gaps between the information collected and what the information requirements standards (IRs) require. This will help discussions between information teams and costing practitioners on assessing and closing the gaps identified.

[47] See *The costing principles*, https://improvement.nhs.uk/resources/approved-costing-guidance/
[48] See Tools and templates to help implement the standards, https://improvement.nhs.uk/resources/approved-costing-guidance-2019

- The **CAT** helps providers understand and record their progress in implementing the standards. It will help you focus your attention on areas to develop and improve based on their materiality.
- **Spreadsheet: Transition path** describes a three-year plan for implementing the standards.
- At the end of this section is an example of a **checklist** to help you develop an assurance process.
- The Model Hospital has useful information for reviewing the cost data.

9. Documenting all costing processes effectively brings benefits that include:

- being able to show the assumptions and source data to end users, which will improve the outputs' credibility and increase confidence in their usefulness
- a clear audit trail – an integral part of good documentation – will facilitate reconciliation and assurance, as well as provide evidence for the management of the overall process; it will also provide a template for improving future calculation of costs
- understandable assumptions that can more easily be challenged, leading to improvements in the costing process.

Assurance on the quality of costing processes and outputs

10. Costing is a material and significant system in provider organisations as it supports national and local pricing processes and generates the underlying data for business and investment decisions. Therefore, we expect providers to ensure costing is included in internal and external audit. This will provide assurance on the accuracy of cost data for its internal and external users.

11. National reviews of the data quality within submissions will be scheduled periodically – this is known as the costing assurance programme.

12. It is important to remember that understanding the costs of delivering services is fundamental to providers managing their financial position and to their business planning. This is why it is recognised that unless cost information is linked to the organisation's ongoing management, it will not accurately reflect the services being delivered.

Ambulance costing processes

13. The more services use cost information, the more they will understand the cost data and how it has been calculated. This in turn will build their confidence in the cost information produced for their service. This is why it is vital to offer an opportunity for services to review and give feedback on their cost data.

14. Cost information should be owned by senior managers and clinicians. Staff from across the organisation must engage with the finance department if it is to provide meaningful support.

Costing user group

15. An example of best practice in engaging stakeholders is to form a ‘costing user’ group with executive and clinical membership. Ideally the chair would be a clinician.

16. Such a group’s overall purpose is to improve the quality of cost information and oversee, provide ideas for, encourage and evaluate the use and understanding of costing information in the organisation.

17. It can achieve this by:

    - reviewing cost information and the cost submission
    - reviewing the quality and coverage of underlying data
    - reviewing existing costing processes
    - agreeing priorities for reviewing and developing the system.

18. To help with this, the group should be supported by members from:

    - IT
    - informatics
    - clinical coding
    - finance
    - service managers
    - other care providers including senior nursing
    - education and training lead
    - a clinical champion (any discipline).

19. This type of review should be part of a rolling programme rather than one-off as part of a national mandated collection.

Regular assurance processes

20. You should have a rolling programme of reviewing the costing processes and outputs to provide assurance that costing information is sufficiently accurate for its intended use. The effort applied to this type of validation should be proportionate to the significance of the costs being measured, and to the costing purpose in line with the principle of materiality.

21. It is important for you to work with clinicians, other healthcare providers and service managers so you can:

    - understand all the resources and activities involved in delivering patient care
    - understand the information sources available to support costing
    - identify the expected costs associated with that care
    - ensure these are reflected in the costing processes within your costing system.

22. Effective board engagement with costing is a prerequisite for improving and making better use of patient-level cost information. Boards have an important role in securing greater engagement between clinical and costing staff.

23. Effective executive support will also lead to more and better governance, including documenting and defining policies and procedures.

24. The director of finance signs off the cost submission as part of the self-assessment checklist. This is on the provider's behalf and confirms the trust has completed all required actions to ensure the submission's accuracy.

Assurance on the reconciliation to other information sources

25. Reconciliation to financial and activity sources is an important part of providing assurance on the costing output's quality. It is important to provide assurance that a single source of data is used for all decision-making. Follow the guidance in Ambulance standard CP5: Reconciliation to ensure you are

reconciling to the appropriate information sources, and spreadsheets CP5.1 and CP5.2.

Assurance on the quality of the cost submission[49]

26. We provide tools to help you with the quality of your cost submission. These include:

- **The self-assessment checklist** (Table CP6.1) ensures providers are reviewing their data quality. It includes executive review and sign-off and minimum expected quality checks.
- **The PLICS data quality tool** (Tableau) is accessed via NHS Improvement's single sign-in website. It reviews the submitted cost data, quickly identifying quality issues, and informs providers if resubmission is required. Providers will receive a quality/index report to help inform their costing and investigate their data. It also enables providers to review their costs with peers.
- **The data validation tool** comprises mandatory validations that indicate whether the submission will fail based on the field and values formatting requirements for uploading the data. The tool also includes checks where analysing the data reveals warnings about expected outputs. These warnings are non-mandatory and should lead your investigation, validation and assurance of the cost data uploaded.

Comparison with peers

27. The national PLICS portal is accessed via NHS Improvement's single sign-in website. The PLICS portal enables providers to review their submitted data and anonymously compare their outputs to their peers. In this way a provider can identify its outlying areas areas and focus on reviewing the activity and costing for these. The PLICS portal provides reports on where providers can improve the costing and assurance of their data. It also identifies potential productivity opportunities and other metrics such as the weighted average unit.

28. The data validation tool provides a summary of data quality warnings that give assurance that all providers' submitted data is comparable and subject to the

[49] Information on these tools and where to find them is in the cost collections guidance. https://improvement.nhs.uk/resources/approved-costing-guidance-2019

same validations as their peers'. The work that follows the warnings generated from the data validation tool will give additional assurance that providers have investigated and corrected their data to best fit the expected costs of the submission and those of their peers.

29. The CAT tool provides a dashboard that allows comparison of CAT scores against your peer providers.

30. You should have a rolling programme of local exercises to regularly compare your organisation's costs with those of your peers.

Costing assurance programme[50]

31. The aim of the assurance process is to provide evidence of the work undertaken and the reasoning behind the decisions made. As such, the audit trail, evidence of meetings, discussions with clinicians, etc should be maintained but not be an end in themselves.

32. Providing evidence for an external assurance audit should not be the main purpose of collecting this information.

33. The evidence provided should also be in harmony with the costing principles.[51]

Example: An assurance checklist

As part of the ongoing assurance process you should use a checklist. Table CP6.1 below is an example of a costing assurance checklist.

This example is for the standards published in February 2019 for 2019/20 data to be collected in the summer of 2020.

It shows an 18-month assurance cycle, so the next year's assurance cycle would start before the current year's cycle is completed. This means two years' assurance cycles would be running concurrently for approximately four months.

[50] See *The Approved Costing Guidance 2019 – what you need to know and what you need to do* for details of the costing assurance programme, https://improvement.nhs.uk/resources/approved-costing-guidance/

[51] See *The costing principles,* https://improvement.nhs.uk/resources/approved-costing-guidance/

Table CP6.1: Example of a costing assurance checklist

Month	Process stage	Checklist	Completed
1 (March 2019)	Implementation of the standards	Standards and associated guidance read by costing team	
1	Implementation of the standards	Relevant standards shared and discussed with relevant departments eg: • Ambulance standard IR1 and IR2: Information requirements shared with informatics • Ambulance standard CP1: Role of the general ledger in costing with finance colleagues • Ambulance standard CP5: Reconciliation shared with your software supplier to ensure system can produce their reports • Costing methods standards reviewed with relevant departments	
2 (April 2019)	Implementation of the standards	Complete the information gap analysis template	
2	Implementation of the standards	Complete the standards gap analysis template	
2	Implementation of the standards	Set up costing assurance log	
3 (May 2019)	Implementation of the standards	Identify areas to work on to improve the quality of costing for this cycle (implementation of standards through to collection)	
3	Implementation of the standards	Sense check identified areas against the costing principles	
3	Implementation of the standards	Meet clinicians and other healthcare providers and service managers to acquire the understanding and information needed to inform the costing process	

Ambulance costing processes

Month	Process stage	Checklist	Completed
3	Implementation of the standards	Inform and agree with executive managers the costing development approach you are taking for this cycle eg: • following the transition path in the technical guidance • focusing on areas of local importance	
3 to 6 (May to Aug 2019)	Implementation of the standards	Implement developments in the costing system	
6 (Aug 2019)	Implementation of the standards	Document processes, assumptions made, etc	
6	Implementation of the standards	Revisit and refine assumptions with clinicians and other care providers and service managers to ensure understanding is correct and will provide meaningful results	
6	Implementation of the standards	Sense check refinements against the costing principles	
6 to 9 (Aug to Nov 2019)	Implementation of the standards	Implement developments in the costing system	
9 (Nov 2019)	Implementation of the standards	Sense check first results from implementation developments with clinicians and other healthcare providers and service managers	
9	Implementation of the standards	Update executive management on first results	
10 to 14 (Dec 2019 to March 2020)	Implementation of the standards	Update costing system on refinements from sense check	
15 (April 2020)	Preparing for the collection	Prepare for collection – review collection guidance again	
16 (May 2020)	Preparing for the collection	Prepare submission using: • self-assessment checklist • data validation tool	
16	Preparing for the collection	Run the reconciliation reports in Ambulance standard CP5: Reconciliation to ensure financial and activity values reconcile	

Ambulance costing processes

Month	Process stage	Checklist	Completed
16	Preparing for the collection	Sense check costing outputs and reconciliation reports in line with the costing principles	
17 (June 2020)	Preparing for the collection	Obtain executive management sign-off of the submission	
17	Preparing for the collection	Complete the CAT	
18 (July 2020)	Post-submission	Review: • the PLICS portal and share with stakeholders • data quality tool	
18	Post-submission	Update the costing assurance log	
Post month 18	Post-submission	Do peer comparison to identify outliers and to feed into the next cycle of costing development	

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