
NHS Grampian

Report of findings ~ *June 2009*

Infection Prevention and Control: Improving through Learning

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1 Background

A potential *Clostridium difficile* outbreak at Dr Gray's Hospital, Elgin, was first suspected on 29 April 2009 in Ward 9, which was immediately closed. Review meetings were held by the infection control team from 30 April, and a problem assessment group on 6 May formally declared an outbreak and established an outbreak control team to implement the NHS Grampian outbreak plan. The Scottish Government Health Directorates (SGHD) was informed of this on 6 May, but had been alerted to a possible incident on 1 May via the performance management team. The hospital was closed to acute admissions on 5 May, when both Wards 7 and 9 were unable to admit new patients. The high dependency unit (ward 8) was still in use.

On 13 May 2009, SGHD requested that NHS Quality Improvement Scotland (NHS QIS) meet with NHS Grampian to seek assurance regarding the infection prevention and control processes and to ensure that learning from the experience is shared and supported from an improvement perspective.

This report summarises the findings of the visit undertaken by NHS QIS to Dr Gray's Hospital on 20 May 2009.

2 Summary of learning

A number of learning points, both local and national have been identified and will be shared across NHSScotland.

Local learning

Process initiation

- Clarity around trigger points for action and communications is required in relation to the SGHD and Health Protection Scotland (HPS).
- Consideration to be given to two trigger points at ward and hospital level.
- The length of time taken to formally instigate an outbreak control team was probably too long.

Outbreak management

- The conduct of outbreak management should be considered for review once actions to control the outbreak are complete, ideally with an external reviewer.
- Concentrating on the daily numbers of symptomatic cases rather than a detailed cumulative time series of all cases may have focused attention on immediate actions rather than investigating the underlying reasons for the outbreak.
- It was difficult to reconstruct events from some of the minutes supplied. These documents need to be complete and the contents clear.
- Although immediate local actions were taken to reinforce infection control, there are still outstanding issues around the key issue of antibiotic prescribing as at 19 May. Firm control of broad spectrum antibiotic prescribing is one of the primary tools in controlling the risk of *Clostridium difficile*.
- Clear criteria for seeking involvement of the NHS Grampian public health department and HPS should be set.

Support tools

- NHS Grampian should ensure local clarity around the uses and purposes of the existing national documentation, with support from NHS QIS and HPS as necessary.

Surveillance/data

- A standard template for ward/hospital surveillance has been developed by the infection control team (including control limits and trigger settings). This should be rolled out across NHS Grampian.
- Introduction of charge nurse key performance indicators for healthcare associated infection (HA) will be taken forward.
- Ensure the routine availability of HAI management information, in one place, with specialist commentary.
- Employment of a nurse consultant in infection control and potentially an epidemiologist.
- Run charts on infection control to be displayed on each ward.

Hospital environment

- NHS Grampian estates department to continue to introduce use of the 5x5 matrix to facilitate prioritisation.
- Implement the Healthcare Associated Infection System for Controlling Risk in the Built Environment (HAI SCRIBE) in high risk areas and consideration of a policy for application of HAI SCRIBE in NHS Grampian.
- Review if bed spacing should be reduced in other areas in addition to Ward 9.

Antimicrobial prescribing

- Implement national guidance on restrictions on the use of broad spectrum antibiotics and instigate an education programme for junior doctors with respect to antimicrobial prescribing.
- Clarify first line choice of treatment for *Clostridium difficile* and implement use of severity grading.
- Clarify procedures for prompt dissemination of updated guidance.
- Consider the Scottish Patient Safety Programme (SPSP) rapid change cycles on improving prescribing.
- Ensure support for a proactive and strong clinical lead in taking forward the prescribing agenda.

Clinical governance structures

- Ensure effective integration of patient safety within the wider clinical governance agenda.
- Ensure the comprehensive collation and specialist interpretation of all information to enable issues to be escalated appropriately through clinical governance and risk management structures.
- Review the business continuity plan.

Communication

- Reiterate the importance of good local communication systems.
- Deploy public health support workers and infection control nurses on the ward at an early stage.
- Ensure the availability of senior managers/clinicians for rapid decision-making.
- Review training effectiveness and the need for targeted training.
- Review management of media. Helpful to identify a single local spokesperson.

National learning

Initiation of processes

- Clarity and confirmation is required nationally in terms of trigger points to action or communication with national organisations, principally for alerting SGHD and HPS.

Outbreak management

- Each NHS board should be learning lessons from the investigation and control of outbreaks, which includes consideration of the final reports of outbreak control teams. Consideration should be given to national training/simulation exercises based on issues arising from real HAI outbreaks.

Support tools

- Clarity is required nationally in relation to the national guidance and tools that have been issued in relation to *Clostridium difficile* associated disease (CDAD). This implies some rationalisation and simplification, and a strategic approach to ensuring consistency of implementation.

Surveillance/data

- NHS boards need assurance that local surveillance systems are now in place, are technically/methodologically correct, and are applied and displayed using a format and method appropriate to each level of the organisation from ward to Board.

Hospital environment

- Some NHS boards have found application of HAI SCRIBE problematic, as it is a tool designed for new-build or major refurbishment. NHS boards which have succeeded could usefully share the approaches required and the perceived value of applying the tool.
- The issue of confused, 'wandering patients' possibly contributing to the spread of infection in open ward settings needs further consideration for local and national learning.

Antimicrobial prescribing

- NHS QIS to raise surveillance of broad spectrum antibiotic prescribing and implementation/enforcement of prescribing policies with the Scottish antimicrobial prescribing group.

Clinical governance structures

- Further consideration needs to be given to ensuring meaningful integration between infection control, risk management and clinical governance structures and agendas.

Communication

- Consider ways of ensuring coherence of response to media enquiries between NHSScotland and the SGHD.
- Take forward action on improving consistency and quality of death certificate data.
- National consideration of the nature of the interaction between NHSScotland and the police around HAI-related deaths and support for staff involved.
- SGHD to ensure a national approach for sharing of information between SGHD and NHS Boards based on the principle of a single point of contact.

3 Summary of findings

At the request of SGHD, NHS QIS' visit to NHS Grampian aimed to provide support to:

- ascertain the facts in relation to the identification and management of the outbreak
- review the actions taken
- give consideration to the learning that can be shared at both a local and national level in order to support continuous quality improvement, and
- assess the level of support (if any) and further actions required within NHS Grampian.

Wednesday 20 May shared learning meeting

On 20 May, NHS QIS, at the request of SGHD, was asked to visit Dr Gray's Hospital in support of the improvement work already under way, and to provide formal reassurance on the concerns raised regarding the recent increase in the number of cases of *Clostridium difficile*.

NHS QIS noted that, once the outbreak had been identified, NHS Grampian managed the situation actively, with several key learning points already having been collated. An action plan had been developed and NHS QIS was assured that all outstanding actions will be completed as detailed in the plan within the given deadlines.

The discussions highlighted a number of areas of good practice and learning points arising out of the deficiencies identified, some of which are specific to NHS Grampian, and some of which are transferable across NHSScotland.

Initiation of processes

Although existing local policies and procedures would trigger the implementation of additional infection prevention and control measures in response to either an individual case or an outbreak, there was a lack of clarity around mechanisms for determining the point at which SGHD and HPS should be informed of an outbreak, and for involvement of HPS in a support role. While the local management team implemented the outbreak plan promptly on suspicion of an outbreak, it took 6 days for NHS Grampian to formally instigate an outbreak control team because of the time taken for the infection control and public health teams to reach consensus on the situation. The outbreak was declared partly on the basis of scoring using the Watt Risk Matrix Tool. In the meantime, the local management team continued to meet and implement its management plan. It was noted that this outbreak coincided with swine flu plans being implemented. This had resulted in key staff being available over the bank holiday weekend when this issue was raised. It also meant that the local management team was already meeting daily.

Some of these issues should be resolved through the current revision of the Watt Matrix being led by HPS.

Local learning/action:

- Clarity around trigger points for action and communications is required in relation to the SGHD and HPS.
- Consideration to be given to two trigger points at ward and hospital level.
- The length of time taken to formally instigate an outbreak control team was probably too long.

National learning/action:

- Clarity and confirmation is required nationally in terms of trigger points to action or communication with national organisations, principally for alerting SGHD and HPS.

Management of the outbreak

Due to the lack of effective local surveillance systems, the true scale of the incident was not initially apparent. Action was initiated when three concurrent cases were noted and the ward (Ward 9) was immediately closed in line with local policy (two or more cases identified concurrently). Following the initial incident meeting on 30 April, the medical director, director of public health and infection control doctor were contacted later that day. A deep clean was commenced on 30 April, and continuing cleaning of 'hand touch' contact points (door handles, bed rails, etc) was reinforced on 13 May. Six beds were removed from Ward 9 on 1 May to improve bed spacing, and ceftriaxone (an antibiotic associated with increased risk of *Clostridium difficile*) was removed from all wards that day. It was noted within the minutes of the review meeting on 2 May that there were six patients with confirmed (or symptoms suggestive of) *Clostridium difficile* infection at Dr Gray's, including two cases on Ward 7. Arrangements for additional cleaning, hand hygiene promotion and setting up training for staff were under way by 4 May. It was apparent at an early stage that the situation was (and continued to be) complicated by a concurrent cluster of norovirus cases.

A problem assessment group, chaired by the infection control doctor, was held on 6 May. It was decided that a formal outbreak should be declared. Audit of infection control practice was reported as satisfactory. Other than restriction on use of ceftriaxone, it was reported on 6 May that action on antibiotic prescribing compliance was still outstanding. It appears at this point that the only data available to the group related to patients currently in the ward, and a time series or epidemic curve was not generated until 9 May. The cumulative number of cases (14) was first minuted on 12 May, then on 14 May (17 cases). There also appears to be no recording of a formal case definition.

The outbreak control team first met on 7 May. A proactive press release on 12 May resulted in intense media interest. Public health was first represented on the outbreak control team on 8 May. HPS was first involved in the outbreak control team meetings on 18 May.

Within the most recent outbreak control team minute submitted to NHS QIS, results of an antibiotic prescribing audit were still awaited and statistical process control charts were being constructed. Epidemiological indications at that point

suggested at least some related cases within the cluster, ie person to person spread.

The final report of the outbreak control team will be needed to confirm these details, and NHS QIS recognises that this was still an actively managed situation at the time of the visit.

Local learning/action:

- The conduct of outbreak management should be considered for review once actions to control the outbreak are complete, ideally with an external reviewer.
- Concentrating on the daily numbers of symptomatic cases rather than a detailed cumulative time series of all cases may have focused attention on immediate actions rather than investigating the underlying reasons for the outbreak.
- It was difficult to reconstruct events from some of the minutes supplied. These documents need to be complete and the contents clear.
- Although immediate local actions were taken to reinforce infection control, there are still outstanding issues around the key issue of antibiotic prescribing as at 19 May. Firm control of broad spectrum antibiotic prescribing is one of the primary tools in controlling the risk of *Clostridium difficile*.
- Clear criteria for seeking involvement of the NHS Grampian public health department and HPS should be set.

National learning/action:

- Each NHS board should be learning lessons from the investigation and control of outbreaks, which includes consideration of the final reports of outbreak control teams. Consideration should be given to national training/simulation exercises based on issues arising from real HAI outbreaks.

Support tools

The issue of the large number of draft/final and advisory/mandatory documents, tools and guidance produced at national level was raised (eg national *Clostridium difficile* guidance, HPS *Clostridium difficile* bundle, NHS QIS severe case investigation tool, HPS *Clostridium difficile* trigger tool). NHS Grampian highlighted that it is extremely confusing for NHS boards to know the mandatory or advisory status of each tool and what should be used in which circumstances at different levels within the organisation. NHS Grampian suggested that rationalisation and greater stability of national guidance would be helpful.

Local learning/action:

- NHS Grampian should ensure local clarity around the uses and purposes of the existing national documentation, with support from NHS QIS and HPS as necessary.

National learning/action:

- Clarity is required nationally in relation to the national guidance and tools that have been issued in relation to CDAD. This implies some rationalisation and simplification, and a strategic approach to ensuring consistency of implementation.

Surveillance/data

Although extensive data are routinely collected for mandatory national surveillance and 'alert organism' interventions, the need for better routine collation and analysis of standardised information was acknowledged and highlighted by NHS Grampian. It was noted that local surveillance measures at the end of April were not sufficient to provide reliable early warning of a possible outbreak, and actual ascertainment of the outbreak depended on the identification at the end of April of three simultaneous cases, constituting an outbreak.

A request was sent by NHS Grampian to HPS in January 2009 for assistance with producing statistical process control charts and training was subsequently agreed for delivery in March. Following retrospective collation of the available data on a statistical process control chart, it became clear that this particular outbreak started much earlier than originally suspected – probably from 1 April. Had these or similar simple run charts been used they could have alerted NHS Grampian to the outbreak and earlier implementation of the outbreak policy would have been possible. A simple trigger alert system – eg when three or more cases were found within Dr Gray's Hospital over any 4-week period – could also have identified this and previous clusters at an early stage and allowed early intervention.

However, action to minimise the spread of the infection was taken promptly once the outbreak was suspected. The outbreak has greatly increased the awareness at all levels of the organisation of the importance of effective and robust surveillance.

The need for the information provided at different levels to have specialist commentary attached was highlighted; interpretation of data is a particular challenge, requiring specialist input. It was noted that NHS Grampian has agreed with NHS Orkney to employ a nurse consultant in infection control, who will be shared between the two NHS boards. The post is awaiting Agenda for Change banding. NHS QIS advised that this should be progressed as a priority. NHS Grampian is also considering the creation of a hospital epidemiologist post to support the existing two surveillance nurses.

Local learning/action:

- A standard template for ward/hospital surveillance has been developed by the infection control team (including control limits and trigger settings). This should be rolled out across NHS Grampian.
- Introduction of charge nurse key performance indicators for HAI will be taken forward.
- Ensure the routine availability of HAI management information, in one place, with specialist commentary.
- Employment of a nurse consultant in infection control and potentially an epidemiologist.
- Run charts on infection control to be displayed on each ward.

National learning/action:

- NHS boards need assurance that local surveillance systems are now in place, are technically/methodologically correct, and are applied and displayed using a format and method appropriate to each level of the organisation from ward to Board.

Hospital environment

Discussions were held on whether the hospital environment was a contributory factor to the outbreak. Ward 9 is in the original block of Dr Gray's Hospital built in 1810, which is no longer an ideal environment for a modern hospital. However, the estates department is working to improve the environment. Monthly environmental audits are carried out on a ward by ward basis, which include members of the Moray patient participation forum. Details of any issues raised and the resulting action plan are sent to the ward manager who is responsible for taking these forward, with a copy also sent to the facilities and estates departments. Key issues are risk managed and escalated where appropriate. Limited resources require issues to be prioritised, and the more expensive actions are prioritised in line with issues raised from patient safety audits.

NHS Grampian highlighted in their internal learning points summary the issue of HAI SCRIBE not being used to review Wards 9 and 10 at Dr Gray's Hospital, despite them being identified as high risk areas in 2007. HAI SCRIBE was applied soon after ascertainment of the outbreak and action will now be taken. Deep cleaning was instituted and the curtains and equipment immediately replaced as required. Bed spacing was also increased by removing beds.

NHS Grampian confirmed that carpeting in the Ward 9 area is in the corridor, beside open bays, and around the nurses' station at both ends of the ward. There is no carpeting in the side rooms or between beds. It was confirmed that a sluice overflow/flood in April had contaminated this corridor carpet, but it had tested negative for contamination with *Clostridium difficile* and was deep cleaned. The ward was planned for temporary closure to carry out refurbishment work and this had previously resulted in other carpeted areas in the hospital being prioritised. However, with the current closure of Ward 9 due to *Clostridium difficile*, it was noted that this work would now go ahead as a priority.

One possible contribution to the spread of infection was a confused 'wandering patient' whose movements and activities were very difficult to circumscribe within the open ward setting. This issue requires further consideration in general terms within NHS Grampian and Dr Gray's Hospital in the context of outbreaks and infection control.

Local learning/action:

- NHS Grampian estates department to continue to introduce use of the 5x5 matrix to facilitate prioritisation.
- Implement the HAI SCRIBE in high risk areas and consideration of a policy for application of HAI SCRIBE in NHS Grampian.
- Review if bed spacing should be reduced in other areas in addition to Ward 9.

National learning/action:

- Some NHS boards have found application of HAI SCRIBE problematic, as it is a tool designed for new-build or major refurbishment. NHS boards which have succeeded could usefully share the approaches required and the perceived value of applying the tool.
- The issue of confused, 'wandering patients' possibly contributing to the spread of infection in open ward settings needs further consideration for local and national learning.

Antimicrobial prescribing

NHS Grampian has an antimicrobial management team in place. This group updated the antimicrobial prescribing policy, which was approved in March 2009, to include restrictions on the use of broad spectrum antibiotics in line with guidance issued in mid 2008. However, there is limited evidence of effective implementation of this policy. There appear to have been some issues in disseminating this document effectively to relevant staff, and in availability of electronic copies of the formulary for reference, particularly when junior doctors are prescribing on the ward. A paper copy of the NHS Grampian empirical guidance for some common infections in adults in the acute sector was circulated to all wards on 1 May 2009.

NHS Grampian reported that measures were put in place immediately on notification of the outbreak to heavily restrict the extensive use of ceftriaxone (a third generation cephalosporin) by physically removing it from the wards and departments in Dr Gray's Hospital. An education programme was initiated for junior medical staff. Pharmacists visit the wards at Dr Gray's on a daily basis. In managing the outbreak, NHS Grampian had recognised the need to implement nationally agreed treatment regimens for treating *Clostridium difficile* in line with clinical severity grading; these had not been in place when the current incident arose.

There is a clear need to take forward robust action in applying and enforcing prudent antimicrobial prescribing as a primary tool in reducing the risk of *Clostridium difficile*, even although NHS Grampian's public health department had not listed antimicrobial prescribing as one of the top five contributory factors

in the outbreak in their initial feedback. The experience of other NHS boards (especially NHS Greater Glasgow and Clyde) in implementing robust prescribing policies should be helpful in taking this forward for NHS Grampian. Evidence from other NHS boards supports the key role of a strong clinical champion in driving this forward.

Local learning/action:

- Implement national guidance on restrictions on the use of broad spectrum antibiotics and instigate an education programme for junior doctors with respect to antimicrobial prescribing.
- Clarify first line choice of treatment for *Clostridium difficile* and implement use of severity grading.
- Clarify procedures for prompt dissemination of updated guidance.
- Consider the SPSP rapid change cycles on improving prescribing.
- Ensure support for a proactive and strong clinical lead in taking forward the prescribing agenda.

National learning/action:

- NHS QIS to raise surveillance of broad spectrum antibiotic prescribing and implementation/enforcement of prescribing policies with the Scottish antimicrobial prescribing group.

Clinical governance structures

Clinical governance structures and reporting frameworks within NHS Grampian were discussed. The reporting mechanisms through the clinical governance structure are broadly satisfactory. Issues that have been escalated to the NHS Grampian clinical governance committee remain on the agenda until closure is reached. However, there was some debate as to whether the correct issues are always escalated. This led to further discussion around the need for information to be comprehensively collated and interpreted to allow issues raised to be escalated appropriately. During the discussion, the importance and value of the infection control team communicating through the clinical governance structure was reiterated, in order to strengthen learning and accountability and to provide assurance that all appropriate action has been taken.

Discussions also covered the integration of patient safety into the clinical governance agenda. There appeared to be some confusion as to the local strategic approach to this. NHS Grampian reported that patient safety has a high profile and that infection control staff are working very closely with the SPSP, which is very welcome.

NHS Grampian explained the need for a review of their business continuity plan. A dedicated team to manage planned activity is needed in the event of an outbreak. During the current outbreak, local guidance on emergency surgical work and admission of symptomatic patients has been agreed on a daily basis.

Local learning/action:

- Ensure effective integration of patient safety within the wider clinical governance agenda.
- Ensure the comprehensive collation and specialist interpretation of all information to enable issues to be escalated appropriately through clinical governance and risk management structures.
- Review the business continuity plan.

National learning/action:

- Further consideration needs to be given to ensuring meaningful integration between infection control, risk management and clinical governance structures and agendas.

Communication

NHS Grampian reported that internal communications were good, facilitated by a small local team, but recognised the need for documents and minutes to be produced in plain English, to facilitate communication and consistency of messages. As the local team is small, expert help was requested from Aberdeen Royal Infirmary. This was achieved through video and teleconferencing in the early stages of the outbreak, and through on-site contact later on. It was felt the action taken locally to ensure good communication with, and provide reassurance to, staff, patients and visitors, generally went very well.

There has been high attendance at additional education sessions run during the outbreak, but junior doctors have required additional support.

NHS Grampian reported that there had been some confusion and perhaps misreporting by the media, which had clearly been the cause of significant anxiety to relatives and patients. To some extent this had been caused by the differences in statements issued by NHS Grampian and the SGHD: the SGHD had reported cumulative cases whereas NHS Grampian had reported the number of cases on a given day. It was not always clear at the time of death whether *Clostridium difficile* was indeed implicated, whether mentioned on the death certificate or not. In response, NHS Grampian had reviewed and revised its policy on completion of death certificates, which must now be completed by consultant staff, in liaison with the Procurator Fiscal where appropriate for HAI-related causes of death.

Other communications actions included: NHS 24 help/advice line set up with information localised to the Dr Gray's Hospital outbreak; public health support workers and infection control nurses deployed on the ward; senior managers/clinicians available at visiting times and 24/7 for decision-making; and dedicated staff support counselling. It was judged that these had all gone well and had made a helpful contribution.

Local learning/action:

- Reiterate the importance of good local communication systems.
- Deploy public health support workers and infection control nurses on the ward at an early stage.
- Ensure the availability of senior managers/clinicians for rapid decision-making.
- Review training effectiveness and the need for targeted training.
- Review management of media. Helpful to identify a single local spokesperson.

National learning/action:

- Consider ways of ensuring coherence of response to media enquiries between NHSScotland and the SGHD.
- Take forward action on improving consistency and quality of death certificate data.
- National consideration of the nature of the interaction between NHSScotland and the police around HAI-related deaths and support for staff involved.
- SGHD to ensure a national approach for sharing of information between SGHD and NHS Boards based on the principle of a single point of contact.

4 Conclusions

NHS Grampian was continuing with its management of the incident at the time of the visit, and is considering the factors which may have led to the outbreak or delayed initial identification. Local action continues to be taken to minimise further spread of the infection and reduce the risk of any recurrence.

One key lesson learned has been the recognition that enhanced surveillance mechanisms and effective and comprehensive collation and interpretation of data are essential for ensuring early warning of potential outbreaks and meaningful reporting at all levels. Enhanced local surveillance is now in place at Dr Gray's Hospital. NHS Grampian is committed to ensuring it continues to develop and enhance systems, processes and structures to ensure that information gathered is held in one place and reported in a meaningful, timely and effective way. NHS Grampian also recognises the surveillance skills deficit which needs to be addressed as a matter of urgency. The plethora of mandatory or advisory *Clostridium difficile* and HAI-related guidance documents, SGHD letters, action plans, toolkits and definitions has clearly caused confusion at all levels within the organisation. There is a strong case for consideration of rationalising, clarifying and prioritising national guidance and tools in order to ensure local clarity and a consistent national message. The most significant issue here is clearly one of focus on supporting sustained and effective implementation rather than the construction of more new guidance.

NHS Grampian has been proactive in ensuring that lessons that can be learned from this incident are shared and has been very open to improvements that require to be made within the organisation to strengthen intelligence and surveillance systems (as well as other deficits) which this outbreak has brought to light.

A number of learning points and good practice points have been identified that will be shared across NHSScotland and with the SGHD.

The meeting on 20 May has provided NHS QIS with reasonable assurance that rapid learning from the experience is being shared and taken forward within NHS Grampian. NHS QIS will undertake to offer further support to NHS Grampian, and to ensure that the issues raised in this report and in the existing internal action plan have been effectively implemented.

Appendix 1: Abbreviations

CDAD	Clostridium difficile associated disease
HAI	healthcare associated infection
HAI SCRIBE	Healthcare Associated Infection System for Controlling Risk in the Built Environment (Health Facilities Scotland)
HPS	Health Protection Scotland
NHS QIS	NHS Quality Improvement Scotland
SGHD	Scottish Government Health Directorates
SPSP	Scottish Patient Safety Programme

Appendix 2: Details of shared learning meeting

The shared learning meeting took place in NHS Grampian on 20 May 2009.

NHS QIS representatives

Dr Peter Christie

Consultant in Public Health Medicine

Mrs Jackie Ley

Nurse Consultant Healthcare Associated Infection

Mrs Fiona Russell

Programme Manager

Mr Kerry Walsh

Head of Clinical Governance Support and Development Unit

NHS QIS met with Board-level, strategic and operational staff.