American Journal of Infection Control ■■ (2018) ■■-■■

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

Major Article

Isolating infectious patients: organizational, clinical, and ethical issues

Dinah J. Gould PhD, RN [a], Nicholas S. Drey PhD, MBA [b], Jane Chudleigh PhD, RN [b], Marco-Felipe King PhD [c], Neil Wigglesworth PhD, RN [d], Edward Purssell PhD, RN [e,*]

[a] *Cardiff University, Cardiff, UK*
[b] *London City University, London, UK*
[c] *University of Leeds, Leeds, UK*
[d] *Guys and St Thomas's NHS Foundation Trust, London, UK*
[e] *King's College, London, UK*

Key Words:
Isolation
Infection
Infectious patients
Ethics

Background: Isolating infectious patients is essential to reduce infection risk. Effectiveness depends on identifying infectious patients, transferring them to suitable accommodations, and maintaining precautions.
Methods: Online study to address identification of infectious patients, transfer, and challenges of maintaining isolation in hospitals in the United Kingdom.
Results: Forty-nine responses were obtained. Decision to isolate is made by infection prevention teams, clinicians, and managers. Respondents reported situations where isolation was impossible because of the patient's physical condition or cognitive status. Very sick patients and those with dementia were not thought to tolerate isolation well. Patients were informed about the need for isolation by ward nurses, sometimes with explanations from infection prevention teams. Explanations were often poorly received and comprehended, resulting in complaints. Respondents were aware of ethical dilemmas associated with isolation that is undertaken in the interests of other health service users and society. Organizational failures could delay initaiting isolation. Records were kept of the demand for isolation and/or uptake, but quality was variable.
Conclusion: Isolation has received the most attention in countries with under-provision of accommodations. Our study characterizes reasons for delays in identifying patients and failures of isolation, which place others at risk and which apply to any organization regardless of availability. It also highlights the ethical dilemmas of enforcing isolation.

Isolation is the segregation of infectious/potentially infectious patients and those who are at particular risk of infection, such as neutropenic patients, to prevent transmission of antibiotic-resistant pathogens, highly contagious pathogens, pathogens that cause serious infections.[1] It is integral to any infection prevention program, but in some countries, notably the United Kingdom (UK) and much of Europe, isolation accommodations are in short supply, with competition from patients who are noisy and those who are receiving end-of-life care.[2-5] Even where single rooms are the norm in general wards, patients who are most sick and on specialist units (e.g., critical care) are often nursed in shared areas to facilitate observation. Single rooms are sometimes assumed to reduce infection risk, but evidence of the ability to contain spread is equivocal,[6,7] and a recent study in an all-single-room hospital did not demonstrate lower infection rates than hospitals where most care is in open bays.[8] Pathogens spread by airborne and contact routes contaminate general ward areas.[9] Possible reasons are breaches in isolation: doors left open, failure to cleanse hands or use personal protective equipment (PPE), and patients leaving the room.[5] Failure to identify infectious/potentially infectious patients and inefficient procedures to transfer them to isolation accommodations might also contribute, but no studies to explore these issues appear to have been reported, although transmission from asymptomatic patients is likely.[10]

* Address correspondence to Edward Purssell, PhD, RN, King's College London, James Clerk Maxwell Building, 57 Waterloo Road, London SE1 8WA, UK.
E-mail address: edward.purssell@kcl.ac.uk (E. Purssell).
Conflict of interest: No conflicts of interest are declared.
Author contributions: D.J.G. conceived the study and developed the data collection tool. N.W. collected the data. M-F.K., E.P., and J.C. conducted literature searches and performed reviews. D.J.G. and M-F.K. analyzed the data. N.D. provided advice on law and ethics. All authors contributed to manuscript preparation.

0196-6553/
https://doi.org/10.1016/j.ajic.2018.05.024

METHODS

We explored procedures to identify infectious/potentially infectious patients and transfer them to isolation accommodations in UK hospitals. It was planned in conjunction with an Expert Panel of 5 infection prevention leads in National Health Service (NHS) trusts who were selected because of their experience and interest in isolation. Each has a lead clinician responsible for infection control. They helped decide questions and the format of the data collection tool, and they commented on findings. Open questions were used because of the lack of previous research concerning isolation.[11] Open questions generate less standardized data than fixed-response formats and are more challenging to analyze, but they avoid the risk of obtaining responses perceived to be expected or desirable.[12] Questions were sent to potential respondents electronically via their professional networks, adopting an approach called "purposive sampling"[13] to obtain "rich information" from individuals targeted because they can provide detailed information about the topic of inquiry.[14] This method can obtain qualitative data as effectively as conventional survey methods.[15] The study was classified as a quality improvement initiative not requiring ethical approval.

Data from each question and from across the dataset were analyzed inductively using conventional content analysis to generate codes based on recurrent themes.[16] Coding was undertaken independently by 2 members of the research team, with third-party arbitration in cases of disagreement. The frequency that codes appeared was documented to quantify key information.[17]

RESULTS

Forty-nine responses were obtained. The size of employing organizations varied, and estimates were given rather than precise numbers. One was an 18-bed facility providing end-of-life care, 1 was a 20-bed private hospital, and 2 specialized in mental health. The remainder were large acute general NHS trusts with up to 2,000 beds that admitted elective and emergency cases. The median number of beds was 708 (interquartile range, 250–1,000). The number of patients requiring isolation varied. In a typical acute NHS trust with 1,000–2,000 beds, 100–200 patients were reported to require isolation for infection per month. One respondent gave very precise information. In an organization with 500 beds, 75 patients required isolation on the day of data collection. Thirty-five (71.4%) respondents reported lack of isolation facilities to be a major problem. Even where cubicles were available, they often lacked ensuite facilities. No statistically significant relationship was observed between size of organization and reported ability to find isolation accommodations for the 48 units reporting these data (exact Wilcoxon rank-sum test: W = 86.5, $P = .07$). Logistic regression of bed numbers against reported ability also failed to show any significant relationship: odds ratio = 1; 95% confidence interval = 0.99–1; $P = .137$. Only 2 (4.1%) respondents reported never having difficulties finding isolation accommodations. They were employed in newly refurbished premises with a high proportion of single en-suite facilities. The remainder described "putting up barriers" in open bays, cohort nursing, or using temporary isolation "pods." Solutions were reached through prioritization when more than 1 patient needed a single room, although only 4 (8.2%) respondents reported using a formal prioritization tool. Two respondents worked in organizations soon to be refurbished with more isolation rooms. Another worked in a newly refurbished facility where the opportunity to increase single-room capacity had not been taken when upgrading was commissioned.

Potential need for isolation was initially identified by clinical staff (n = 21, 42.8%), the infection prevention team (n = 15, 30.6%), jointly between both (n = 12, 24.55%), and in 1 case according to local policy. No relationship was observed between staff responsible for decision-making and size of organization (Kruskal-Wallis: H = 1.77, *df* 3 $P = .62$). Shared decision-making was complex and drew on multiple sources of information, with communication among infection prevention teams, clinicians (mainly nurses), and laboratory staff. A typical response is reproduced below:

> 'Results are made available to clinical staff (either from the lab or reported by infection prevention staff or microbiologists). We use an 'isolation matrix' within trust policy to guide the decision. The infection prevention team is used as a resource to provide advice about isolation, particularly when prioritisation is required.' The policy referred to here being the hospital or organisations infection control policy.

Multifaceted decision-making typically involved 3–4 different approaches per response. The most commonly mentioned were risk assessment (n = 17, 28.8% of reports), additional and more involved discussion between clinicians and infection prevention teams (n = 16, 32.6% of reports), and assessents of clinical symptoms (n = 15, 30.6% of reports). Eight (16.3%) obtained a history from the patient or family suggesting high risk of infection (e.g., recent overseas travel, admission from a nursing home, or transfer from another hospital with a known cluster of infections). Availability of isolation accommodations and alerts on patients' papers or electronic records were each identified 7 (14.3%) times. Four respondents (8.1%) mentioned use of an isolation prioritization tool. Mode of transmission was considered important in 3 responses (6.1%); in these accounts, patients suspected of having airborne infection received priority. One respondent considered "local epidemiology" in decision-making. Emergency patients presented the greatest challenge. Wherever possible, they were moved to a cubicle in the emergency department or straight to ward isolation accommodations. Thirty respondents (61.2%) reported "bed shuffling" among frontline staff, infection prevention teams, and bed managers to locate suitable accommodation. Where prioritization tools were used, they were perceived to be especially valuable during bed shuffling.

Final decision to isolate was made by the infection prevention team in 9 (18.4%) organizations, by clinicians in 3 organizations (6.1%), and according to trust policy in 1 organization. In the remaining 36 (73.4%), joint decisions were reached among infection prevention teams, clinicians (usually nurses), and staff responsible for bed management. Clinicians took greater responsibility for less complex cases featuring patients with more commonly encountered pathogens and at night and on weekends when the infection prevention team was less available. One respondent explained how their team provided education to clinicians to enable them to make decisions safely. It was usually possible to identify patients with methicillin-resistant *Staphylococcus aureus* (MRSA) and *Clostridium difficile* through alerts on the notes; however, this was not the case for other less commonly encountered pathogens, especially when differential diagnosis was possible. Delays obtaining laboratory reports or patients not giving a complete history on admission occasionally resulted in delays. Nearly half (46.9%) of respondents reported that communication problems caused delays with housekeeping services, delivery of PPE, other equipment necessary to "put up barriers," and isolation signs for doors.

Deciding to isolate and the ability to sustain isolation depended on patient-related factors in addition to the risk of spreading infection. Acute illness or behavioral issues could result in a decision not to isolate or, once initiated, isolation procedures breaking down:

> "Managing patients safely in isolation impacts on our ability to isolate, especially in critical care."