



# Low concordance with HIV testing guidelines in a retrospective review of intensive care practice

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## ABSTRACT

Records were reviewed (n=1052) for patients admitted to a large general intensive care unit (GICU) and examined for HIV testing criteria published in UK national testing guidelines (UKNG). All actual tests sent from GICU were also examined for comparison. Strict application of the UKNG revealed 30% of patients met criteria for HIV testing on admission to GICU. With pragmatic application, 18% of admissions met criteria for testing. Less than 5% of admissions were actually tested when no testing guideline was adopted.

Discussion: The UKNG can be adopted in a representative GICU to increase HIV testing rate by 4–6-fold.

## INTRODUCTION

The UK prevalence of HIV continues to rise, a quarter of those infected remain undiagnosed, and a large number present late with low CD4 counts.<sup>1</sup> HIV infection associated with relatively preserved CD4 counts is associated with common illnesses, for instance, bacterial pneumonia, providing opportunities to diagnose HIV earlier. Many individuals are 'very late' presenters with CD4 counts below 200 cells/ul which puts them at risk of opportunistic infections that often leads to general intensive care unit (GICU) admission.<sup>1</sup>

A higher prevalence of HIV has been identified in acute hospital admissions, and this is likely to be reflected in GICUs. Many common community-acquired infections are increasingly recognised to be associated with HIV infection.<sup>1</sup> Early diagnosis of HIV in critically ill patients impacts markedly on management and care and improves survival outcomes.<sup>2–3</sup> Testing admissions to GICU for HIV is desirable, but relying on traditional HIV risk factors lacks sensitivity. UK national guidelines for HIV testing (UKNG) recommend using HIV indicator illnesses to trigger testing.<sup>4</sup>

Most GICU admissions lack the mental capacity to consent to care, and clinical decisions are made in patients' best interests governed by the Mental Capacity Act 2005 in England and Wales. The UKNG may provide a framework for targeted HIV testing of GICU admissions. Fewer than 10% of UK GICUs follow any formal HIV testing guidelines, and the minority using the UKNG report poor compliance.<sup>5</sup>

We have audited all GICU admissions against the UKNG at the time of their admission.

## METHODS

We conducted a retrospective case note review of all admissions to the GICU from 1 January 2010 to 31 December 2010. The 18-bed GICU serves a teaching hospital split between two sites with a total of 1900 ward-based beds. It admits elective and acute surgical or medical patients, but not neurosurgical or cardiothoracic surgical patients. In the study period, there was no formal HIV testing policy. Clinicians requested tests based on their personal knowledge of HIV or after consulting an HIV specialist. The local HIV prevalence was 0.15%. Approval for this work was granted by the clinical governance network of Sheffield Teaching Hospitals NHS Foundation Trust.

The GICU's electronic database (Metavision, iMDsoft, Europe) was interrogated for admission details, including demographics, primary/secondary diagnoses, history of presenting complaint (PC), medications and past medical history (PMH). A readmitted patient created a new record. Two clinicians with experience in HIV medicine (MD and PJC) independently reviewed each record against the UKNG criteria for HIV testing and assigned to one of three groups; 'Y' group:  $\geq 1$  criteria present that is, an HIV indicator illness in the PC or PMH or being in an increased prevalence group, 'N' group: no criteria present with no reasons to test for HIV, 'P' group: UKNG criteria were absent but assessor considered testing was indicated from the clinical picture. Discrepancies in group classifications were resolved by discussion between the assessors, or failing that, final arbitration by a consultant in HIV medicine (DHD).

In practice, HIV testing can sometimes be safely deferred until the return of mental capacity, and then performed with consent. We therefore undertook a second analysis of the 'Y' and 'P' groups. When the return of mental capacity could reasonably and safely be awaited without adversely affecting management, the record was reassigned to the 'N' group as immediate testing on admission to GICU was not indicated. For example, when the HIV indicator had a clear aetiology other than HIV, such as hospital-acquired pneumonia (HAP), or admission was planned following elective surgery but an indicator illness occurred incidentally in the PMH. This second analysis is referred to as the pragmatic application of the UKNG.

To examine actual HIV testing activity during the study period and tests performed before and after admission to GICU, the virology laboratory electronic database was interrogated for all HIV tests sent within the Trust. For each test, the laboratory

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arrival time and result were retrieved, and the GICU record examined up to the day of testing to identify the indication for testing. Each case was assigned to one of the three study groups using the same criteria as above.

## RESULTS

One thousand and fifty-two complete records (996 patients) were identified: the entire cohort admitted to GICU that calendar year. No records were eliminated from analysis; 53 patients were readmitted one or more times. Within the cohort, 24% were admitted from the emergency department, 0.9% originated from another hospital and the remainder came from within the Trust.

### A small minority of patients were tested for HIV before admission to GICU

Of the patients admitted to GICU; three were known to be HIV positive prior to admission to hospital. A further 27 patients had been tested during the current hospital admission including two positive results. Of these, 14 were admitted from the infectious diseases and haematology units, where opt-out testing is implemented.

There were 1022 patients admitted to GICU with an unknown HIV status. These records were examined for UKNG testing criteria.

### A large minority of GICU patients met criteria for HIV testing

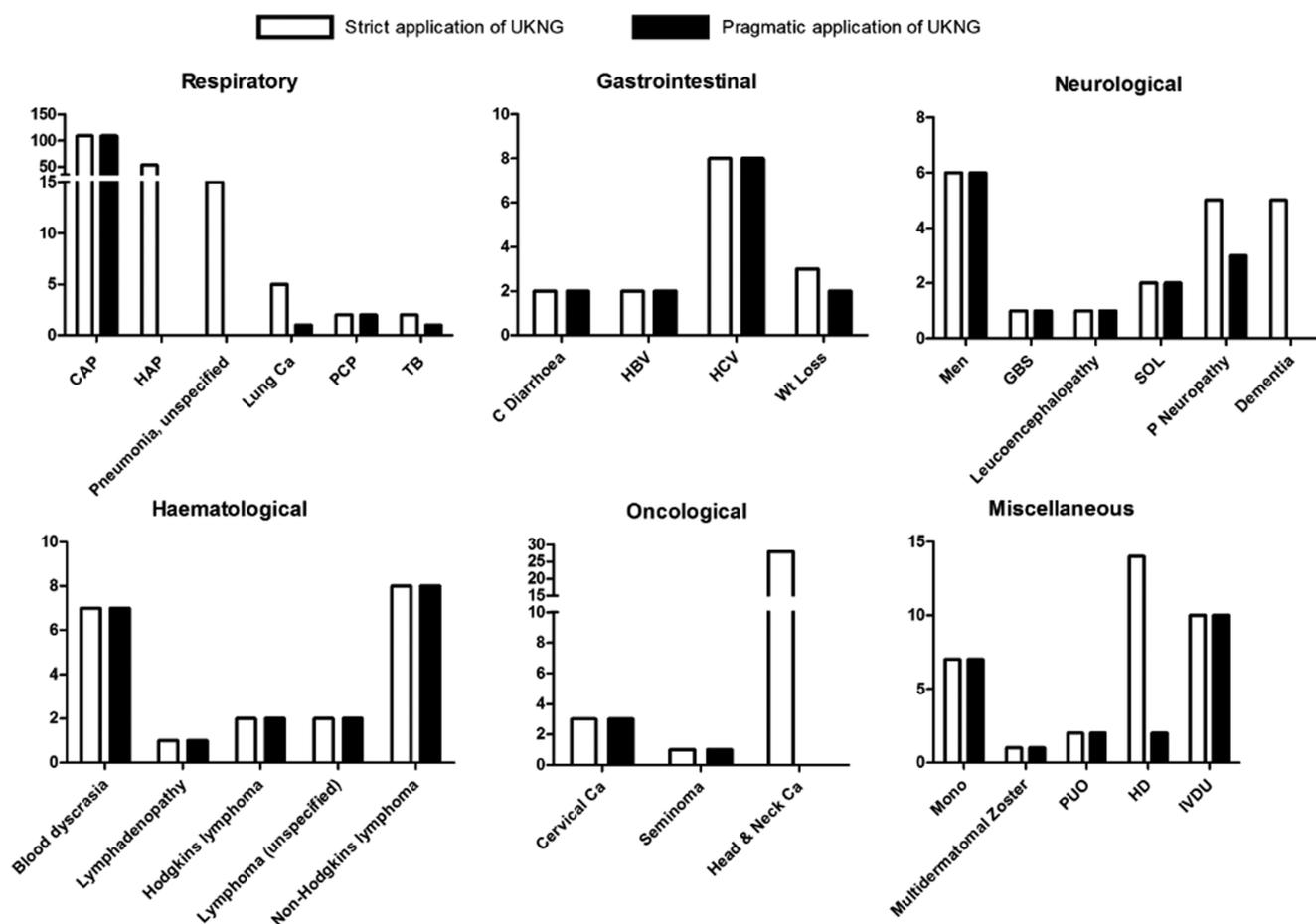
With strict application of the UKNG, 307 (30.0%) records met criteria for HIV testing (Y group) and 72 (7.0%) were placed in the P group. With the pragmatic application of the UKNG, 186 (18.2%) and 72 (7.0%) were assigned to the Y and P groups, respectively. Of the strict Y group, 235 (76.5%) had an indication to test for HIV in their PC, the remainder solely in their PMH. In the pragmatic application of the UKNG, this figure was 158 (84.9%).

By January 2013, a further 175 (17.6%) patients had been tested for HIV following discharge from GICU. All were seronegative.

### Most meeting criteria to test had an acute respiratory illness in the PC

In strict application of the UKNG, 187 (60.9%) of HIV testing indicators were illnesses of the respiratory system; 3 pneumocystis pneumonia (PCP), 2 pulmonary TB, 5 lung cancer and 177 bacterial pneumonias.

In the pragmatic application of the UKNG, four cases with a PMH of lung cancer, 53 with HAP and 1 with TB were excluded along with 15 unspecified cases of pneumonias. This left 114 (61.3%) patients with respiratory disease as the primary HIV indicator illness, and 109 of these were community-acquired pneumonia (CAP). This is shown in figure 1 along



**Figure 1** demonstrates the difference in patient numbers meeting UK national guidelines for HIV testing criteria in the strict and pragmatic application indicator illnesses within the cohort. CAP, Community-acquired pneumonia; HAP, hospital-acquired pneumonia; Ca, cancer, PCP, pneumocystis pneumonia; TB, pulmonary tuberculosis; C diarrhoea, chronic diarrhoea; HBV, hepatitis B; HCV, hepatitis C; Wt Loss, unexplained weight loss; Men, aseptic meningitis; GBS, Guillain-Barré syndrome; SOL, space-occupying lesion; P neuropathy, peripheral neuropathy; Mono, mononucleosis-like syndrome; PUO, pyrexia of unknown origin; HD, haemodialysis; IVDU, intravenous drug user.

with comparisons of pragmatic and strict application of UKNG for other indicator illnesses.

### HIV testing during the study period

During the study period, 49 (4.8%) tests were requested for 45 patients following admission to GICU. Four were duplicate testing in error. Three (6.7%) tested seropositive. They presented with CAP, PCP and cerebral toxoplasmosis; 36 tests met UKNG criteria (Y group), six did not (N group) and seven more were assigned to the P group where no UKNG testing criteria were present, but the clinical scenario supported testing.

For cases where a UKNG indicator to test was present on the date of admission to the GICU, the median time to sending an HIV test was 2.3 days (range 0–23); 74% were sent >24 h after admission. Two subsequently positive HIV tests were requested >2.5 days following admission, after advice had been sought from the infectious diseases team. These intervals do not include further delay for confirmatory testing and reporting. Testing was delayed by three or more days in 37% of those tested.

### DISCUSSION

With strict application of UKNG, a third of patients admitted to this GICU possessed indicators to test for HIV. A majority involved the respiratory system. When a model of pragmatic testing was used, one-fifth of all admissions met UKNG criteria for testing. The absence of an HIV testing policy in this GICU is representative of a majority of GICUs in England.<sup>5</sup> Without the use of formal testing guidelines, <5% of admissions were tested for HIV. This low rate was often associated with delays of several days in requesting tests when a reason to test for HIV was present on admission to GICU.

The GICU in this study is generally comparable with many in the UK. As for most regions in the UK, the local population HIV prevalence was below the 0.2% threshold where universal testing of acute medical admissions is recommended. Accordingly, targeted testing based on UKNG is an appropriate strategy to implement for the populations it serves.

These data demonstrates that adoption of UKNG by GICUs would significantly increase the rate of HIV testing and bring about day-of-admission testing. The department of health has prioritised early diagnosis for the coming years, and supports HIV testing in non-traditional settings. Early HIV diagnosis in GICU patients improves short-term and longer-term outcomes, guides appropriate investigation, and ensures timely specialist input. In many situations, antiretroviral therapy will be started during the GICU admission to improve survival outcomes to discharge from ICU and beyond.<sup>3 4</sup> This is particularly important for the subset of individuals with low CD4 counts, and opportunistic infections in whom early initiation of antiretroviral therapy is often indicated.<sup>1</sup>

This audit supports the national adoption of current UKNG to improve HIV testing and diagnosis in GICUs where the general prevalence of HIV is below 0.2%.

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### REFERENCES

- 1 Dockrell DH, Edwards S, Fisher M, *et al*. Evolving controversies and challenges in the management of opportunistic infections in HIV-seropositive individuals. *J Infect* 2011;63:177–86.
- 2 Nelson M, Dockrell D, Edwards S, *et al*. British HIV Association and British Infection Association guidelines for the treatment of opportunistic infection in HIV-seropositive individuals 2011. *HIV Med* 2011;12(Suppl 2):1–140.
- 3 Morquin D, Le Moing V, Mura T, *et al*. Short- and long-term outcomes of HIV-infected patients admitted to the intensive care unit: impact of antiretroviral therapy and immunovirological status. *Ann Intensive Care* 2012;2:25.
- 4 Fischer M, Ong E, Palfreman A. UK National Guidelines for HIV Testing 2008. 2008 [May 2012]; <http://bhiva.org/documents/Guidelines/Testing/GlinesHIVTest08.pdf> (accessed 27 Feb 2013).
- 5 Dodd M, Pryce A. A national survey of HIV testing in intensive care: moving forwards. *J Intensive Care Soc* 2012;13:136–9.