

Reducing Contamination of midstream urine samples using visual aids; a Quality Improvement Project

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Background

- The collection of midstream urine (MSU) samples is a vital part of antenatal care but is prone to contamination. **High contamination rates** in MSU collection delay diagnosis and treatment of female patients.
- This is principally driven **by inadequate comprehension and execution of the mid-stream, clean-catch (MSCC) technique**.
- At present, patients' understanding of the procedure is **limited by the verbal or written instructions** conveyed by the clinician. Anecdotal evidence suggests this effect is exacerbated in cohorts with limited comprehension of spoken or written English.
- This quality improvement project aims to develop and pilot the utility of a **visual aid** in educating patients to provide an uncontaminated midstream urine sample.

Design

Our group has **developed a novel visual aid** with an illustrative **demonstration of the MSCC technique** which can be understood independently or as an adjunct to written or verbal instruction.

- The aid was presented in all clinical areas to women attending a **consultant-led antenatal clinic** at West Middlesex University Hospital, in addition to standard verbal guidance. Patients could also watch an animated video online by following a QR code.
- After providing their sample, patients were asked to complete a short **10-question survey**, to qualitatively assess the **legibility** of the visual aid, its impact on their **understanding** of the MSCC technique and its **overall helpfulness**.

Results

60 women responded to our survey of which, 72% had previously given a urine sample using the midstream clean catch technique. Overall, **93% of women found the visual aid helpful**, with **65%** expressing that they found it **necessary for their understanding**.

Of the women that had given a midstream urine sample in the past, **50%** said they had **previously not known that the sample should be collected from the midstream** (as opposed to first-pass) urine.

40% of participants did not speak English as a first language, encompassing a diverse linguistic population, including languages such as Nepalese and Hindi. **96% of non-native speakers found the visual aid improved their understanding** of the MSCC technique.

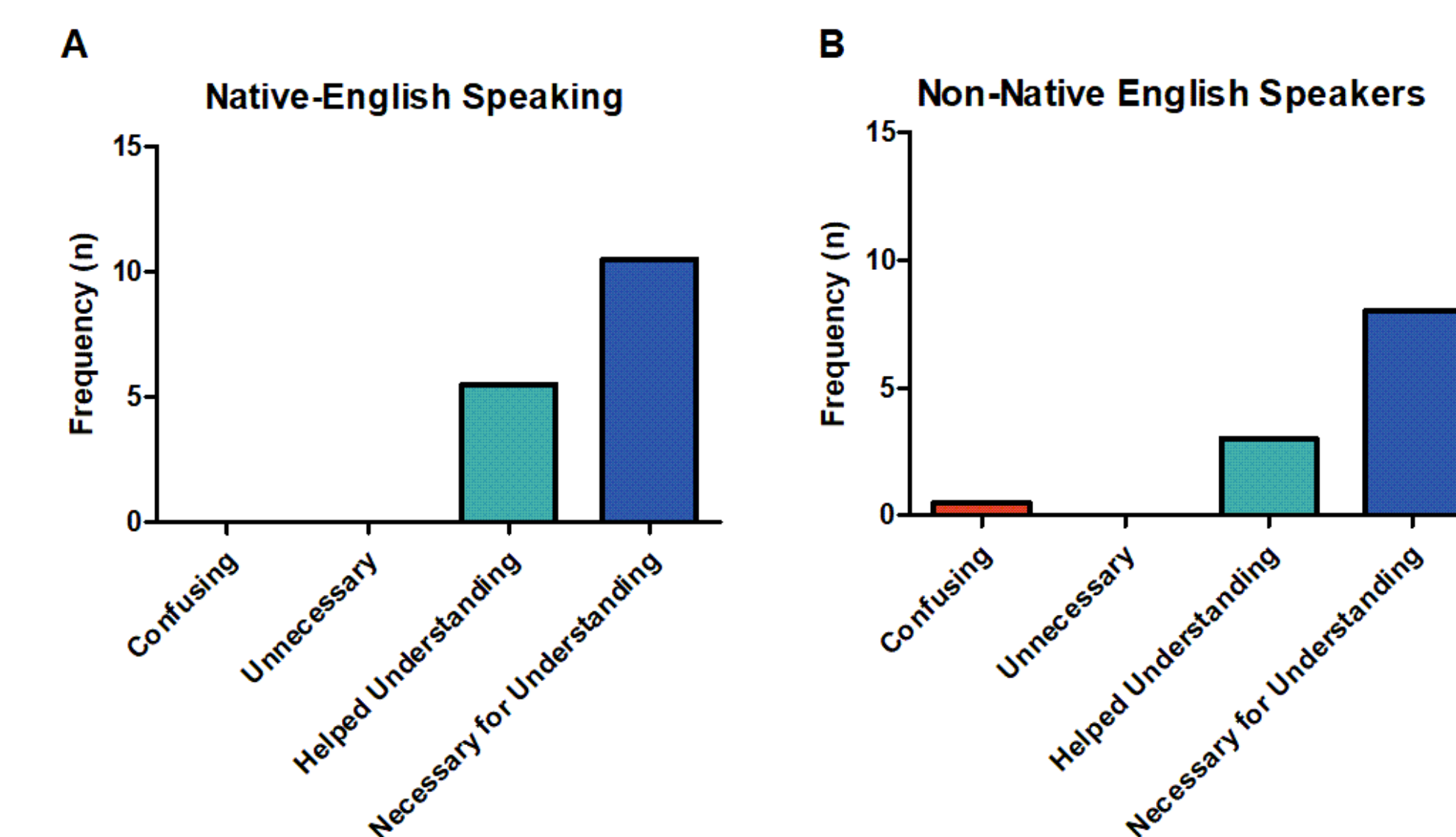


Figure 1: Proportion of total Native (A) and Non-native (B) English-speaking respondents that identified the visual aid to be necessary for understanding, helped understanding, Unnecessary or confusing.

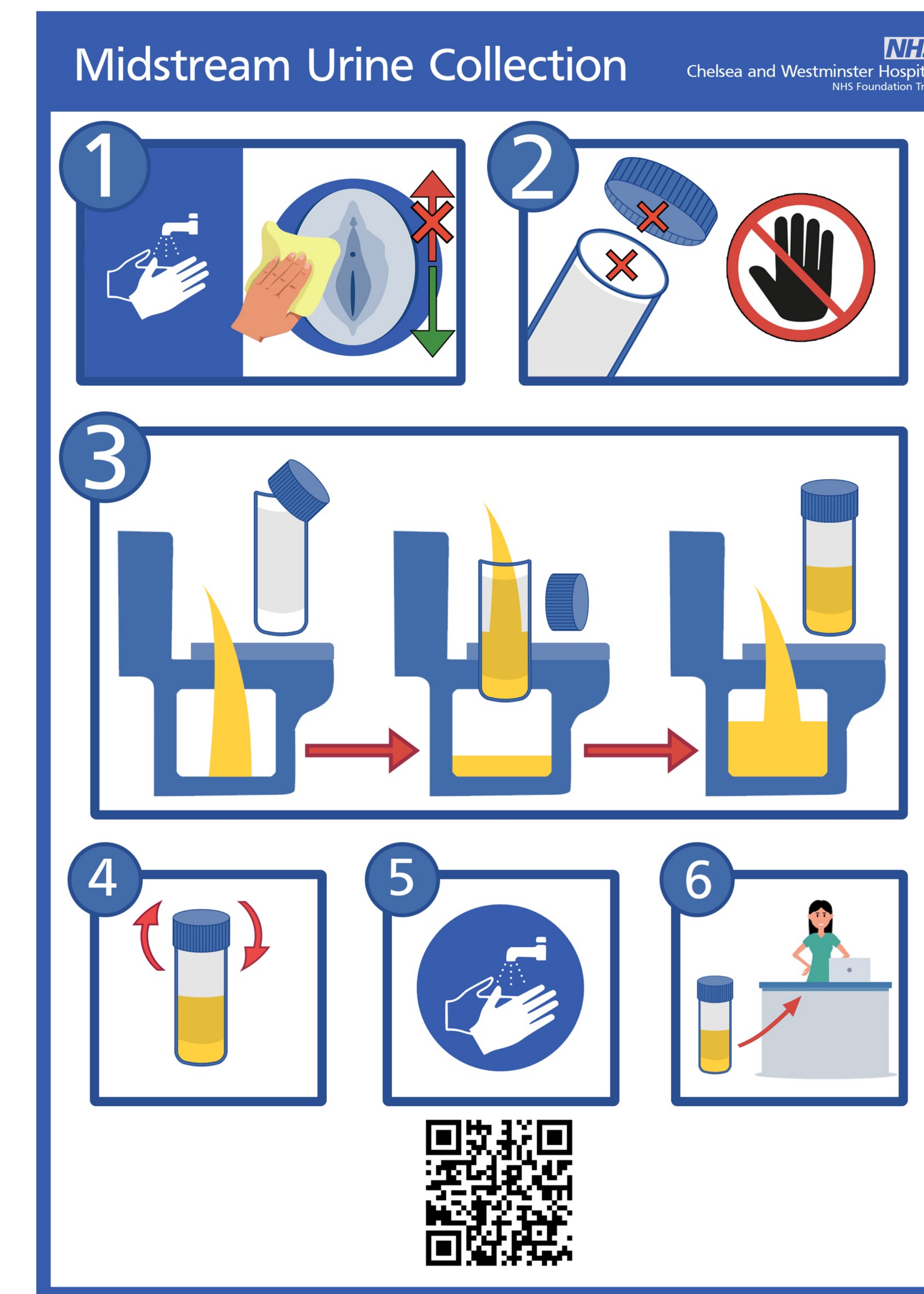


Figure 2: Visual aid given to patients in antenatal clinic to demonstrate mid-stream clean-catch technique. The QR code (bottom) directs patients to an animated video with subtitles that can be auto-generated to many common languages.

Discussion

The feedback we received from patients was overwhelmingly positive across all cohorts of women.

Despite having previously been provided with verbal and written instruction, a significant proportion of women had learnt **for the first time** that the sample should be **collected from the mid-stream**, rather than first-pass (a common source of contamination).

It stands to reason that our intervention not only provides **an alternative modality for communication** with patients where **English is a secondary language**, but also **as an adjunct to native speakers**; to improve the capacity for understanding where verbal and written communication falls short.

However our pilot is not complete **without assessing** the impact on the **rates of sample contamination**. In the future, we hope to conduct a quantitative analysis to determine whether this intervention has reduced the proportion of contaminated MSU samples in our population.

Improving the understanding of effective MSCC technique through visual aids may in turn:

- Relieve the substantial temporal and economic burden** of repeating contaminated samples and associated appointments.
- Lead to **more timely diagnosis and treatment** for our patients, ultimately improving their overall healthcare outcomes.
- Reduce language and communication barriers to **empower** the pregnant women in our care to **improve their comprehension of medical investigations**.