Human Factors Approach to Aseptic Technique in Renal Dialysis

Authors: Michelle Clark¹, Lisa Sutherland¹, Sarah Freeman², Pamela Sinclair³, Vivien Swanson¹, Gill Walker².

¹Psychology Directorate, NHS Education for Scotland; ²Nursing, Midwifery & Allied Health Professions, NHS Education for Scotland; ³NHS Greater Glasgow & Clyde

Introduction

Patients requiring haemodialysis are at serious risk of blood stream infections (BSI) due to frequent cannulation of arteriovenous fistulas and arteriovenous grafts (AVF / AVG).

NHS Greater Glasgow and Clyde (GG&C) perform over 54,600 cannulations per year and therefore it is crucial that aseptic technique (AT) is performed to prevent BSI.

Blood return line

Blood to dialyser

Vein

Artery

Fig 1: Arteriovenous Fistula

A need was identified to develop education solutions for staff aimed at standardising AT behaviour and improving consistency of practice.

An innovative approach integrating health psychology, human factors and practice observation audit was used to investigate healthcare staff adherence to a specific set of AT steps to improve patient safety. A human factors approach looking at the interaction between individuals and other elements of their work system (tasks, team, environment, systems, tools and technology) can highlight potential areas for service redesign and quality improvement.

Project Aims

1. To understand what particular human factors may influence inconsistencies in standard clinical practice in NHS GG&C renal services.
2. To support the future development of NES education solutions which improve AT and promote patient safety.

Methods

A mixed methodology (qualitative, quantitative and direct observation of AT being performed) was used, allowing triangulation of results and increased reliability.

Qualitative – 6 focus groups of renal staff (n=25), including haemodialysis support workers, registered nurses and senior charge nurses from a mixture of inpatient and outpatient settings, were carried out to investigate staff experiences of performing AT. The Theoretical Domains Framework (TDF)² was used to guide discussion and analysis of results.

Quantitative – A questionnaire, designed to assess beliefs, attitudes and self reported AT behaviour adopting a preferred set of AT practices within a renal setting, was completed by 106 renal nurses. The survey, informed by focus group findings, was based on health psychology models of behaviour change (TPB³, and TDF) which could be mapped onto a human factors model.³

Observation – A clinical expert (nurse educator) conducted 63 audit observations across 6 NHS GG&C hospital sites, of cannulation, connection & disconnection procedures. These were measured against AT steps.

Results

Qualitative – Categorical thematic analysis showed that all 5 human factor domains have the potential to influence AT performance.

Specifically, potential barriers to AT were identified, such as:

- Patient population – more elderly patients with multiple health conditions
- Time pressures – eg due to staffing levels
- Patient behaviours – self care
- Increased cognitive load – clinical risk decision making

References


Project Aims

1. To understand what particular human factors may influence inconsistencies in standard clinical practice in NHS GG&C renal services.
2. To support the future development of NES education solutions which improve AT and promote patient safety.

Methods

A mixed methodology (qualitative, quantitative and direct observation of AT being performed) was used, allowing triangulation of results and increased reliability.

Qualitative – 6 focus groups of renal staff (n=25), including haemodialysis support workers, registered nurses and senior charge nurses from a mixture of inpatient and outpatient settings, were carried out to investigate staff experiences of performing AT. The Theoretical Domains Framework (TDF)² was used to guide discussion and analysis of results.

Quantitative – A questionnaire, designed to assess beliefs, attitudes and self reported AT behaviour adopting a preferred set of AT practices within a renal setting, was completed by 106 renal nurses. The survey, informed by focus group findings, was based on health psychology models of behaviour change (TPB³, and TDF) which could be mapped onto a human factors model.³

Observation – A clinical expert (nurse educator) conducted 63 audit observations across 6 NHS GG&C hospital sites, of cannulation, connection & disconnection procedures. These were measured against AT steps.

Results

Qualitative – Categorical thematic analysis showed that all 5 human factor domains have the potential to influence AT performance.

Specifically, potential barriers to AT were identified, such as:

- Patient population – more elderly patients with multiple health conditions
- Time pressures – eg due to staffing levels
- Patient behaviours – self care
- Increased cognitive load – clinical risk decision making

References