

Understanding Aseptic Technique

An RCN investigation into clinician views to guide the practice of aseptic technique

CLINICAL PROFESSIONAL RESOURCE





Acknowledgements

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Contents

Executive summary	4
Background	5
Findings	7
Discussion	9
Recommendations	10
References	11

Executive summary

Aseptic technique is recognised as an essential component of all infection prevention programmes but terminology used to define it varies.

An RCN programme of work looking at nurses' experiences and understanding of aseptic technique developed as an outcome of updating of two central resources supporting the prevention of infection - RCN Standards for Infusion Therapy (RCN, 2016) and Tools of the Trade (RCN, 2018). RCN members noted the RCN guidance within these publications, specifically in relation to glove use, and began to question the use of gloves as a component of aseptic technique in acute and community settings. The outcome of further engagement with members on this issue, using research methodologies to plan activity and describe the findings, is included in this report.

Methods: Several methodologies were used to undertake this work including:

- content analysis of definitions given in clinical guidelines
- an online survey of nurses views and
- a Delphi study.

The programme objectives were to:

- determine how the term 'aseptic technique' is defined in clinical guidelines
- investigate practising nurses' views on asepsis and aseptic technique
- undertake a Delphi study to explore directions for future policy, research and education to guide future nursing practice.

Findings: Ten guidelines were identified. There were 16 definitions of aseptic technique falling into two clusters:

One cluster comprised the Aseptic Non-Touch Technique (ANTT©) framework, a guideline in which it received mention and a guideline based on ANTT©.

The second cluster comprised the remaining guidelines. Content was mixed. There was no evidence that any guideline had been subjected to the rigorous development process required in contemporary health care.

It was not possible to obtain consensus about directions for future practice from the Delphi study or agree best practice.

Survey key findings:

- 2,201 (94.54%) survey participants defined 'aseptic technique'.
- 'Sterile' appeared in 1,248 (56.7%) definitions.
- Other frequently mentioned terms were: 'clean' (n=733, 33.3%), 'contamination' (n=608, 27.6%) and 'non-touch' (n=557, 25.3%).
- Cross-infection or cross-contamination appeared in 356 (16.17%) definitions.
- 941 nurses responded to a question on the survey enquiring about opportunities for continuing professional education in relation to aseptic technique. 253 (26.88%) were satisfied. 311 (33.05%) were dissatisfied.

Conclusions: There is disparity in the way that aseptic technique is defined in clinical guidelines and by individual nurses. New guidelines and implementation tools need to be developed using a recognised methodology with stakeholder participation and a defined schedule for updating and revision reflecting changes in nursing practice.

Key questions as a result of this RCN work are the degree of standardisation of an aseptic technique required, how much variation can be allowed under different circumstances and whether guidelines for different clinical settings and procedures should be different.

This report and RCN work to date on this issue emphasise the importance of reflection on nursing practice. As an essential nursing skill and practice supporting the prevention of infection, the report highlights the need to investigate concerns raised by RCN members associated with confusion or divergence in views on purpose and definition that could impact in a negative way on process and ultimately patient outcomes. The findings from this work support the RCN vision to lead and influence through health education, learning and development. This report therefore forms part of our profession's education journey to enhance nursing practice based on enquiry and the generation of evidence to inform practice.

Background

Aseptic technique is highlighted as an essential component in infection prevention programmes (1, 2). Ability to undertake aseptic technique is an important clinical skill for all health professionals, especially nurses and midwives. Aseptic technique is used to support procedures such as cannulation, insertion of urinary catheters, blood cultures, wound dressings and administration of intravenous drugs. Nurses and midwives are the largest professional group with continuous patient contact and undertake a wide range of procedures requiring aseptic technique (3). Aseptic technique is very well established and there is an assumption that all health professionals understand its aims and when it should be applied. Since the 1990s the only noteworthy change in clinical practice has been the introduction of Aseptic Non Touch Technique (ANTT[®]) which was intended to standardise practice (3).

ANTT[®] is now recognised as best practice in some countries (5, 6) and is regarded by the Institute of Health and Care Excellence (7) as an example of an aseptic technique applicable to the management of vascular access devices. NICE also suggests that ANTT[®] might represent a framework for guidance in relation to other procedures that need to be conducted aseptically but does not support adoption across the board. There is evidence that traditionally conducted aseptic technique practised under tightly controlled conditions can prevent health care-associated infection (8, 9, 10, 11) but no independent well-controlled trials to evaluate ANTT[®] compared to traditional approaches appear to have been reported (12) and it is not clear whether ANTT[®] or traditional guidelines are based on a comprehensive literature review or have been subjected to the stages of external scrutiny, refinement and patient and public involvement considered essential in contemporary clinical guideline development (13).

ANTT[®] introduced a new vocabulary for existing terms: key-parts (sterile equipment) and key-sites (open wounds, medical device access sites). Discussion with clinicians suggested that the new terms might add an extra layer of confusion over the nomenclature surrounding aseptic technique and a recent pilot study (14) undertaken in two NHS trusts provided evidence of uncertainty. In the absence of a common language to articulate

the meaning of 'aseptic technique' controversy must inevitably exist concerning its aims, agreement over clinical standards and ability to ensure that standards are met.

Objective

Determine how the term 'aseptic technique' is defined in clinical guidelines, by practising nurses and a Delphi study to explore directions for future policy, research and for education to guide practice.

Methods

Clinical guidelines

Official guidelines at national and international level were identified through extensive searches and consultation with infection prevention experts. Content analysis of the definitions given for aseptic technique was undertaken.

Delphi study

A master-class was held at the RCN headquarters in London in 2018 to discuss the findings of the pilot study (14) and future directions for practice. Delegates were infection prevention nurses and others with a special interest in aseptic technique. There were 45 attendees. The following issues were discussed:

1. Whether aseptic technique should be a standardised procedure or informed by risk assessment
2. Whether it should be based on a set of steps underpinned by an understanding of the principles of maintaining asepsis.
3. Whether its purpose is primarily to protect the individual patient or whether it should also protect the wider patient population, staff and environment.
4. Whether the procedure should be the same for all patients.

Discussion was summarised on flip-charts and used to create a series of statements. Agreement and disagreement was explored in a Delphi study undertaken online with a sub-sample (n=25) of the delegates.

Online survey

Definitions were obtained from practising nurses through an online cross-sectional survey conducted via an electronic link placed on the RCN website. Participants were invited to answer the question: 'Please explain in your own words what the term "aseptic technique" means to you'. Data were obtained for clinical grade, clinical setting where participants were employed, geographical locality, whether participants had received updating specifically in relation to aseptic technique since qualifying and their experiences of continuing professional development (CPD) in relation to aseptic technique. Data were collected throughout May 2019. Ethical approval for the survey was given by the research ethics committee of the university leading the study. All participants gave informed consent.

The survey data underwent detailed content analysis. Searches were undertaken for the following terms: 'sterile', 'sterility', 'contamination', 'cross-infection', 'ANTT', 'key part' and 'key site'. A range of words and phrases were used to describe cross-infection and cross-contamination: 'transmission', 'transfer', 'spread' and explicit mention of the need to protect other patients, the environment or the member of staff undertaking the procedure.

Findings

Definitions from official guidelines

Ten official guidelines or definitions were identified. Four originated from the United States, (15, 16, 17, 18) two from the UK (7, 12), one from Australia (5) and one was international (19). We included the ANNT[®] framework (4) in analysis and an easily-accessed website frequently visited by clinicians (20). Collectively they contained 16 definitions of aseptic technique. Two broad clusters were detectable. The World Health Organization definition (20) related specifically to injection administration and was an outlier. One cluster comprised the Aseptic Non-Touch Technique (ANTT[®]) framework (4), a guideline in which it received mention (7) and a guideline based on ANTT[®] (5). The second cluster consisted of the remaining guidelines. The definitions they contained were all different.

Delphi study

Two Delphi rounds took place. It was not possible to obtain consensus. Delegates commented extensively on each issue in both rounds revealing many controversies and conflicting opinions. For instance, they gave examples of the 'general principles' underpinning aseptic technique but these were different in every case and although agreeing that the procedure should always be the same, they added caveats, suggesting that it was safer for unqualified nurses to adhere to the same steps while knowledgeable practitioners (such as themselves) could and should modify the procedure according to patient needs or circumstances.

Survey

There were 2,328 survey responses. Most participants (n= 1,886, 81%) worked in the NHS. The remainder were employed in general practice, private practice, the non-NHS public sector or charities. Most participants (n=1,528, 65.63%) were in senior posts (ward manager or above). They practised throughout the UK, had been qualified for a mean of fifteen years with a range of three months to forty years and worked in a variety of clinical settings.

Responses to the open question were given by 2,201 (94.54%). Of these 111 (5%) consisted of 1-2 words (e.g. 'sterility', 'clean', 'clean/sterile', 'non-touch/sterile'). There was enormous variation in the remaining 2,090 responses. Each was different.

Frequency of key terms

The term 'sterile' appeared in 1,248 (56.7%) definitions. The other most frequently mentioned terms were 'clean' (n=733, 33.3%), 'contamination' (n=608, 27.6%) and 'non-touch' (n=557, 25.3%). Cross-infection and cross-contamination were mentioned in 356 (16.17%) definitions. ANTT[®] was mentioned in 60 (2.7%) definitions. Its related terminology was quoted without explicit reference to ANTT[®] in 108 (4.9%) definitions. Some nurses referred to 'important parts' or 'sites at high risk' reminiscent of ANTT[®] terminology without stating the term 'key site' or 'key part'.

Number of concepts used to describe aseptic technique

In 641 (29.2%) responses a single concept was used to define aseptic technique (e.g. 'sterile' or 'clean'). Seven hundred and ninety one (35.9%) participants identified two concepts. These might be contradictory (e.g. 'prevent infection and minimise contamination'). The remaining 769 (34.9%) participants used three or more terms in their definitions. The terms 'clean' and 'sterile' were used interchangeably in 31 (1.4%) definitions. The terms 'infection' and 'contamination' were used interchangeably in 40 (1.81%) definitions. Fifty two participants (2.23%) used the phrase 'as sterile as possible' and a further 48 (2.2%) used the phrase 'as clean as possible'.

Over half (n=1,426, 64.78%) the participants commented on the aim of aseptic technique. In 527 (23.9%) responses the suggested aim was to prevent, prohibit or eliminate infection or contamination. In 469 (21.3%) responses the suggested aim was to prevent risk of infection or contamination. In the remaining responses suggested aims were to reduce (n=204, 9.26%) or minimise (n=226, 10.26%) risk of infection. Eighty eight (4%) participants stated that aseptic technique should be performed under

'strictly controlled conditions' without further explanation of why this phrase meant.

Some participants described the procedure employed to undertake aseptic technique, usually in relation to wound care. These descriptions varied in detail but in many cases indicated that the procedure was complex. Different aspects were sometimes singled out as particularly important. Gloves were mentioned in 363 (16.5%) responses, hand hygiene in 143 (6.5%) responses and personal protective equipment (without explicit mention of gloves) in 50 (2.27%) responses. The importance of having a dressing trolley to act as a surface on which the sterile field could be prepared was mentioned in 46 (2%) responses. The practice of maintaining a 'clean' hand to contact the sterile field and a 'dirty hand' to contact a wound was mentioned in 46 (2%) responses. Four participants suggested that risk assessment should be undertaken before undertaking a procedure aseptically. Very few participants gave a detailed description of ANTT®.

In 318 (14.5%) responses participants remarked on the difficulty of undertaking procedures aseptically outside the conditions possible in operating theatres. Participants working in community settings commented most on the difficulty of achieving asepsis and sometimes questioned whether it is necessary during the management of chronic wounds.

Over half the participants gave examples of when aseptic technique should be undertaken. Wound dressings were mentioned most often (n=863, 39.2%) followed by the insertion of urinary catheters (n=144, 6.5%). The generic term 'invasive device' appeared in 107 (4.8%) responses. Eighty four (3.16%) participants mentioned the insertion and handling of intravascular lines.

Satisfaction with continuing professional development

A second open question on the survey asked participants to comment on their experiences of CPD in relation to aseptic technique. Nine hundred and forty one responses were obtained. 253 (26.88%) participants were satisfied. 219 (86.55%) reported good support from their employer and of these 189 (86.4%) claimed to receive good or satisfactory opportunities for

updating. The amount and type of input varied greatly, however. In some cases a structured programme was reported to be in place with arrangements for competency testing which ranged from annually to every three years. In others a one-off training session was provided or input was online and might or might not be mandatory. Some employers had introduced training when ANTT® was implemented. In a few cases it was apparent that groups of colleagues had collaborated to undertake informal peer review of practice. In 21 responses it was apparent that considerable reliance was placed on train-the-trainer/cascade training in an organisation. This might be formal with recognised preparation of trainers (e.g. link nurse schemes or as part of the process used to introduce ANTT®) but some individuals were cascading skills and knowledge apparently without such training and without accreditation.

311 (33.05%) were dissatisfied with opportunities for CPD. Four sources of dissatisfaction emerged. Participants reported witnessing unwarranted variations in practice (n= 55, 5.84%), practice they considered to be suboptimal and in need of correction (65, 6.9%), considered that standards had fallen in relation to aseptic technique because pre-registration nurses are no longer taught and assessed adequately (n=109, 11.58%) or thought that their employer had not provided adequate opportunities for clinical updating (n= 124, 13.17%). Of these 59 (6.27%) had attempted to update themselves in their own time, with variable success. Most attempts had involved reading, discussions with colleagues who had been able to access CPD or by viewing demonstrations online. Some participants who had resorted to web-based learning were able to identify limitations related to the quality and accuracy of information provided.

Discussion

The enquiry demonstrated that there is enormous disparity in the way that aseptic technique is defined in clinical guidelines and by individual nurses and in arrangements for CPD and competency testing. Members of the Delphi panel could not reach consensus on how aseptic procedures should be conducted.

The terms 'sterility' and 'clean' and 'infection' and 'contamination' were often used interchangeably within the same survey response. Very few participants mentioned ANTT[®] or its associated terminology and an even smaller number appeared to be fully conversant with ANTT[®]. Risk assessment which forms an important part of ANTT[®], was mentioned by very few participants. There were differences in participants' perceptions of the aim of aseptic technique. Some suggested that its purpose is to prevent infection or contamination. Others suggested that aseptic technique should reduce or minimise the risks of infection or contamination. Accounts of the procedure varied and it was most commonly used to describe wound care. A small number of participants, mainly those employed in community settings, pointed out the practical challenges of undertaking procedures aseptically and questioned whether it is necessary when dressing chronic wounds likely to be contaminated with nosocomial pathogens. There was no evidence that any of the official clinical guidelines we analysed had been subjected to the rigorous process of development required in contemporary health care (13).

The question requesting information in relation to CPD evoked a range of responses relating not only to opportunities for updating but also to how aseptic technique is practised in general. Numerous sources of dissatisfaction were reported. These included a perception that standards had fallen since the late 1990s when the mandatory assessment of aseptic during nurse education was removed, concern about poor practice and difficulty accessing CPD.

This appears to be the first major study to explore how the term 'aseptic technique' is defined by clinicians and the first attempt to compare the definitions included in clinical guidelines. The findings indicate that nurses do not support the need for standardisation when aseptic technique is conducted. Instead they suggest that generic clinical guidelines for aseptic technique need to be sufficiently flexible to reflect differing circumstances and patient needs.

Policy-makers have assumed that there is a universally accepted definition of the term 'aseptic technique', shared understanding of its aims and agreement concerning how and when procedures should be undertaken aseptically. The findings of this study challenge this assumption and suggest a need for new, more rigorously developed clinical guidelines.

Recommendations

Policy

- Develop new multidisciplinary guidelines to support the practice of aseptic technique in patient care. To meet contemporary standards (13) this should be generated using a recognised methodology that is transparent, involve stakeholders and have a defined schedule for updating. It is unlikely that a single approach will be appropriate to meet the needs of all clinical situations and settings.
- Develop a range of implementation tools in conjunction with stakeholders to support uptake in different clinical settings. These should be freely available.

Research

- Explore how the management of chronic wounds can be modified while maintaining patient safety and containing the risks of cross-contamination and cross-infection.
- Obtain data from other professional groups who undertake aseptic technique in different clinical settings and for different types of patients.
- Undertake interviews with smaller samples of participants to explore what is meant, for example, when they define aseptic technique as a 'clean and sterile' procedure.

Education

- The outcomes of this work will inform future RCN activity to support education and development of nursing practice associated with aseptic technique.
- Practitioners will need to be made aware of new guidelines and implementation tools as they evolve. Regular updates will be necessary.
- Current arrangements for CPD need to be reviewed.

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