Introduction to ANTT
Why the need for ANTT?
The Great Myth

“Aseptic technique is straightforward and universally understood by health care staff, and universally taught by all healthcare educators”

“Its just the same rules from theatres applied to wards”

“Everyone knows how to do it”
Brief History of ANTT

• Originated in 1995 – following national survey
  • ‘Took off’ in 2003
• Endorsed by Epic2, RCN Infusion Standard (2010) NICE 2012
  • Now the de facto standard aseptic technique in the UK
• Used in more than 20 countries
  • Expanding rapidly
• Overseen by The-ASAP
Major Problems with Aseptic Technique

Practice Language

Equipment

Environment

Clinical Practice
An Unhelpful Paradigm

Sterile technique
Aseptic technique
Clean technique

Strict Aseptic Technique
Transfer Technique
Glove Technique
Alternative Technique
Non-sterile Technique
Clean Non-touch Technique
Medical or Clean Asepsis
Hampshire Dressing Technique
Clean technique…. “A technique that is designed to prevent the introduction of microorganisms, but in recognition that the site is already colonised with bacteria it is not aseptic”.

“Dressing technique should be clean and aimed at preventing cross-infection: Strict asepsis is not necessary.”
Intermittent self-catheterisation may be carried out using a **sterile technique** or a **clean technique**;

nurses and other health professionals use a **sterile (aseptic, non-touch) technique** in hospital

and most patients are taught to use a **clean (socially clean but not aseptic) technique** in the community (Lemke et al, 2005).
Aseptic preparation and procedure areas need to be clean and managed appropriately for ASEPTIC work
Christopher Fuller et al 2011

7000 Observations

Overall hand washing rate was 47%

Reduced to 41% when gloves were used.
The hands of anesthetists are contaminated immediately before patient care with a wide range of bacterial pathogens.

This was linked to contaminated patient IV tubing and the immediate patient environment in anaesthesia.

As a result, intraoperative bacterial transmission to the IV stopcock set was 12% of cases, half of which were from the anaesthetists hands.

Data from 2012 places this figure at 21% from a larger multi-centre study.
In national clinical audits, the core components of aseptic technique are compromised 50%* of the time.

* The-ASAP Pre-ANTT implementation audits 2008-2012
Problems with aseptic technique

- No standard
- Poor equipment choices
- Poor understanding of asepsis
- A historical & unhelpful paradigm
- Poor hand cleaning
- Ritual based practice
- Confusion & ambiguity
Things are improving …

but there is still room for improvement …

There are more than 1,200 Surgical Site Infections alone recorded each year

Between Jan and Sept last year 6,573 MSSA cases were reported to the HPA

1 HPA Quarterly Epidemiological Commentary: Mandatory MRSA & MSSA bacteraemia, and Clostridium Difficile infection data (July – September 2011)

Where aseptic procedures are performed:

Clinical procedures should be carried out in a manner that maintains and promotes the principles of asepsis.

Education, training and assessment in the aseptic technique should be provided to all persons undertaking such procedures.

The technique should be standardised across the organisation.

An audit should be undertaken to monitor compliance with the technique.
What is ANTT?
ANTT Principles and Practice

‘From the community to the operating theatre’.
ANTT is...

Theory-Practice Framework...
‘A Rule Book’
(that defines aseptic technique)

The ANTT-Approach
(that ensures and demonstrates effective practice)

Clinical Guidelines
(that further standardize practice)
Applying Theory to Practice

The **ANTT Clinical Practice Framework** defines the different **components** of aseptic technique such as Key-Parts, aseptic fields and non-touch technique etc....

.....and defines **how they interrelate with each other** to ensure effective aseptic technique.

This is defined in **4 Principles** and performed with **4 Safeguards**.

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The **Principles** and **Safeguards** of ANTT are applied to practice routinely by the ‘**ANTT-Approach**’

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**6 Actions for Safe Aseptic Technique**

1. **Risk Assessment**
   - Select Standard or Surgical-ANTT according to the technical difficulty of achieving asepsis

2. **Environmental Management**
   - Avoid or remove contamination risks

3. **Decontamination & Protection**
   - Including hand cleaning, personal protective equipment, barrier precautions, disinfecting Key-Parts

4. **Aseptic Fields**
   - General, Critical and Micro Critical Aseptic Fields protect Key-Parts and Key-Sites

5. **Non-Touch Technique**
   - Key-Parts must only come into contact with other Key-Parts and Key-Sites

6. **Decontamination**
   - Stop cross infection by safe equipment disposal, disinfection and hand cleaning

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Principle 1

ANTT is designed to protect patients from infection for all invasive clinical procedures including maintenance of invasive devices; the aim is always asepsis.

Asepsis: Definable, Safe and Achievable

Sterile
-Free from all microorganisms

Clean
-Free from marks & stains

Asepsis
-Free from pathogenic microorganisms In sufficient numbers to cause infection

This is achievable in typical health care settings

This is not achievable in typical health care settings
In ANTT, Asepsis is achieved by ‘Key-Part and Key-Site Protection’. i.e. By protecting Key-Parts and Key-Sites from microbiological contamination from the health care worker & the immediate environment.
Principle 3

ANTT needs to be: **Efficient as well as Safe**

**Surgical-ANTT** is used for complicated procedures, that are more invasive, with more **Key-Parts** that are harder to protect over a longer period of time.

and **Standard-ANTT** for uncomplicated procedures that are less invasive, fewer **Key-Parts**, that are easier to protect over a shorter period of time.
Principle 4

To determine Surgical or Standard ANTT: a risk assessment is performed, based on the technical difficulty of achieving asepsis.

To determine Standard or Surgical-ANTT consider the risks posed by...

- The number and size of Key-Parts & Key-Sites.
- The procedure environment
- Degree of invasiveness
- Procedure duration
- User competency

The healthcare professional then asks....

ANTT RISK ASSESSMENT
‘In order to maintain asepsis of Key-Parts and Key Sites, does the main aseptic field need to be managed critically’?

(i.e. Only sterilized and aseptic equipment can come into contact with the aseptic field).

Why is this important?
Because risk assessment should be based on technical criteria that reflects the procedure risks; and that is reproducible between different healthcare workers.

Yes ➔ Surgical-ANTT
No ➔ Standard-ANTT
Safeguard 1

Basic infective precautions such as hand cleaning & the disinfecting of medical devices significantly reduce the risk of Healthcare Worker and environmental contamination of Key-Parts and Key-Sites

Why is this important?
The healthcare workers presents the biggest risk of contamination and infection to the patient.
Safeguard 2

Identification and management of Key-Part and Key-Sites

Key-Sites are open wounds, including insertion and puncture sites.

Key-Parts are the parts of the procedure equipment or medical devices that come into direct or indirect contact with other active Key-Parts, any liquid infusion or Key-Sites.

‘Key-Parts and Key-Sites must only come into contact with other active aseptic Key-Parts or Key-Sites or sterile liquid infusions’.

Key-Parts and ‘Key-Sites’ may be active or non active. For example, an IV port not in use is inactive. Non active key-parts must be rendered aseptic prior to use by cleaning and disinfecting.

Why is this important?
If contaminated during invasive clinical procedures or maintenance of invasive medical devices, Key-Parts and Key-Sites provide a direct route for the transmission of pathogens into the patient.
Safeguard 3

**Non-touch technique** is a critical skill that protects Key-Parts & Key Sites from the Healthcare worker and the environment – for both Surgical and Standard-ANTT

### NTT in Standard-ANTT

### NTT in Surgical-ANTT

**Why is this important?**
Because the best way to protect a Key-Part or Key-Site is simply not to touch it. (Even in Surgical-ANTT where practical).
Safeguard 4

**Aseptic fields** protect Key-Parts and Key-Sites from the immediate environment. Surgical and Standard-ANTT require different aseptic field management.

- **Surgical-ANTT**: Critical Aseptic Field
- **Standard-ANTT**: General Aseptic Field + (Micro) Critical Aseptic Fields
Standard-ANTT

Main General Aseptic Field
Standard-ANTT

Main General Aseptic Field

Micro Critical Aseptic Fields

Non-Sterile Gloves

NTT essential
Standard-ANTT
General Aseptic Field
Micro Critical Aseptic Fields
Non-Sterile Gloves
NTT essential

Key-Parts protected individually
Surgical-ANTT
Main Critical Aseptic Field
Sterilized Gloves
Surgical-ANTT

Main Critical Aseptic Field

Sterilized Gloves

Desirable are…

Micro Critical Aseptic Fields

NTT
Surgical-ANTT

Main Critical Aseptic Field

Sterilized Gloves

Desirable are...

Micro Critical Aseptic Fields

NTT

Key-Parts protected in one large aseptic field
Applying the ANTT Principles and Safeguards to Practice

‘The ANTT-Approach’
The ANTT-Approach (Surgical & Standard-ANTT)

‘6 Actions for Safe Aseptic Technique’

<table>
<thead>
<tr>
<th>Key-Part / Key-Site risk assessment</th>
<th>1</th>
<th>Select the right technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental management</td>
<td>2</td>
<td>Reduce, avoid risks</td>
</tr>
<tr>
<td>Decontamination &amp; Protection (PPE)</td>
<td>3</td>
<td>Clean hands, gloves etc. disinfect Key-Parts</td>
</tr>
<tr>
<td>Aseptic field management</td>
<td>4</td>
<td>Protect Key-Parts/Sites</td>
</tr>
<tr>
<td>Non-touch technique</td>
<td>5</td>
<td>Protect Key-Parts/Sites</td>
</tr>
<tr>
<td>Decontamination</td>
<td>6</td>
<td>Prevent cross infection</td>
</tr>
</tbody>
</table>

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ANTT Guidelines
ANTT Guidelines

Are designed by experts in each clinical competency

The sequence of procedure and infection control steps are risk assessed using a unique tool designed by ANTT

Peer reviewed by experts and users nationally
**Sequencing risk assessment tool applied to blood culture collection**

(Example for illustration only)

<table>
<thead>
<tr>
<th>Risk: Is assessed according to the potential contamination of the HCP hands per Step.</th>
<th>Risk grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control is lost for every step omitted</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Decontamination of HCP</td>
</tr>
<tr>
<td>1</td>
<td>Benign Step low risk of contamination</td>
</tr>
<tr>
<td>2</td>
<td>Decontamination Step low risk contamination</td>
</tr>
<tr>
<td>3</td>
<td>Dirty Step high risk contamination</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ANTT (Bedside)</th>
<th>(Prep room)</th>
<th>(Bedside onwards)</th>
</tr>
</thead>
<tbody>
<tr>
<td>consent/wash</td>
<td>clean field</td>
<td>gather equip</td>
</tr>
<tr>
<td>clean hands</td>
<td>clean bottles</td>
<td>tour/palp/rel</td>
</tr>
<tr>
<td>innoc blood</td>
<td>dressing</td>
<td>clean hands</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DH (Bedside onwards)</th>
</tr>
</thead>
<tbody>
<tr>
<td>clean hands</td>
</tr>
<tr>
<td>puncture</td>
</tr>
</tbody>
</table>

There is an argument for a hand clean before innoculating the blood to bottle. (Ideally flip lids immediately prior inoculation)

Tourniquet applied to early for too long. Significant risk of re-palpation. Haemorhage. No instruction on what to do if re-palpation necessary. Key aseptic events missing. Sequence issues eg. A number of dirty events immediately prior to bottle cleaning. Bottle cleaning probably increases risk of contamination.

The red steps denote the critical steps of each procedure i.e. the steps which key-parts or sites are most at risk of contamination.
Following discussion with the WHO and the NPSA we agreed to reflect the fact that most procedures occur in different areas. Typically starting in a clean room, then the patients bedside and then in a dirty utility room or decontamination zone. This zone concept is still applicable in an ITU Setting, as even when all stages occur near and at the bed side, the concept of a prep, administration and decontamination zone promote best practice.
Blood culture has a number of critical Steps
Safe sequencing ensure all Critical Steps are preceded by decontamination (Green) or ‘benign’ (yellow) activities. (This is why the order of the guideline is important and mandatory).
The critical steps shown on the sequencing risk tool are highlighted on each guideline in red.
Does ANTT help reduce HCAI?

An evidence based approach

A brief illustrative sample from surveillance-based data pre / post ANTT implementation
**Reduction of HCAI by the Adoption of Aseptic Non-Touch Technique (ANTT)**


**Central Manchester University Hospitals NHS Foundation Trust**

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**Introduction**

- Nosocomial bacteraemia carries a significant morbidity and mortality and therefore represents a threat to patient safety.
- Infections related to vascular and urinary catheters account for over 40% of nosocomial bacteraemia in UK hospitals.

**Our Trust...**

- Central Manchester University Hospitals NHS Foundation Trust encompasses 6 hospitals over 4 sites across Manchester.
- Annual turnover circa £600m
- Over 8,000 staff
  - 375 consultants
  - 2800 nurses and midwives
  - 1250 under-graduate students
- Circa 1400 beds
- 8 Clinical Divisions
- Manage in excess of 1 million patient pathways per annum
  - 175,000+ A&E Attendances
  - 110,000+ Inpatient/Day case episodes
  - 600,000+ Outpatient Attendances

**Where were we?**

- In 2006 we had:
  - Rising incidence of MRSA bacteraemia and high rate of GRE bacteraemia
  - Route Cause Analyses indicated potential issues with cannula management
  - Blood culture contamination rate c12%
- Infection Control measures having limited impact on clinical outcome
- Incidence of MRSA bacteraemia increasing
- GRE rates amongst highest in the country
- C. diff rates rising
- Infection control seen as the business of the infection control team
- Not on trajectory to meet required reduction in bacteraemia

**Implementation of ANTT**

- ANTT included as a part of Trust Infection Prevention and Control strategy
- Implementation process started September 2006
  - Vascular access
  - Urinary catheterisation
  - Blood cultures
  - Endo-tracheal intubation
- Education and training provided to all clinical staff
- Individual assessment of staff in relevant procedures
- Weekly reporting of staff trained

**Results**

- During the 12 month period prior to the implementation of ANTT the number of MRSA bacteraemias was 57.
- This reduced to 15 for the subsequent 12 months (reduction 74%)
- GRE bacteraemias reduced from 49 to 19 (59% reduction)
- MSSA bacteraemias reduced from 92 to 68 (26% reduction)
- Blood culture contamination reduced from 12% to 5%.

**Conclusion**

- Introduction of ANTT contributed to significant reduction in MRSA, GRE, MSSA bacteraemia rates and fewer false positive blood cultures
- ANTT is amenable to audits of both training and compliance
- ANTT complements other infection prevention and control measures

**But...**

- No ‘magic bullet’ – other Infection Prevention and Control measures must be adhered to and continually improved to ensure safe, consistent high quality care to patients.

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**References**

1. Coello R et al., J Hosp Inf 2003
2. Rowley S, Nursing Times 2001
3. Dodgson K et al., SHEA conference 2009

For further information: dawn.pike@cmft.nhs.uk
The Case for ANTT

A long history with strong evidence that when infection hot spots occur practice is reactively standardise and prescribed.

The ANTT practice framework and implementation methodology simply extends this successful approach, but does so proactively rather than reactively, and across a broader spectrum of practice.

It’s a long term commitment with long term benefit.

Thank You & Good Luck