Mammography infection control: Should this be part of quality assurance programmes?

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www.myESR.org
**Purpose**

Humans have become reservoirs for exotic viruses and antibiotic resistant bacteria; Worldwide, it is estimated that 53million people are asymptomatic carriers of MRSA.

**Research Aim**

Aim was to investigate:

Ø whether specific infection control protocols exist in mammography units

Ø frequency/ consistency of cleaning of these mammography units

Ø whether this cleaning was within QA and/or documented

Ø whether documented cleaning/ disinfection should be in regular QA

**Research Motivation**

Nosocomial infections are a worldwide problem with multiple and severe effects that are economic, social, emotional and may result in morbidity or mortality. Despite stringent and numerous infection control guidelines, infection spread is on the increase.

Known factors in transmission are well documented both as reservoirs and vectors:

- Staff factors/ human factors

- Role of inanimate environment

Are all of these factors present within mammo units thus increasing overall bio-load and contributing to nosocomial infections?

**Background**

*Routes of Transmission*

**Direct contact** - when micro-organisms are physically transferred from one person to another

**Indirect contact** - when micro-organisms are transferred from one host to another on animate or inanimate objects via hands, equipment, food and water and are airborne.

Every human is host to an enormous number of microbes. Humans are the greatest source of bacteria into the environment.

*The main vector*
Humans remain the main vector of infection. Handwashing is well researched and unequivocally the single most important procedure for preventing nosocomial infection - BUT THIS IS NOT DONE.

Every inanimate surface in the mammography unit is a reservoir for exotic viruses and antibiotic resistant bacteria. **Worldwide, the greatest contaminant remains MRSA.**

*All agree that both hospital environments and outpatient environments situate patients and staff in an "oasis of infection"*

**Issues of infection control specific to mammography**

Patients present in several stages of disease process from well woman to late cancer. There are several infection control issues particular to mammography and exacerbated by the advanced age of the majority of the patients. This advanced age is associated with breakdown of epithelial barriers of skin and the possibility of mucosal tissues being invaded by pathogenic organisms.

Compression of the breast adds to the stress on the epidermis and pushes commensals into the tissues. Handling of the breast during positioning with the close proximity of radiographer and patient increases the mixing/transmission of pathogens. The spread of disease is rapidly spread into the surrounding tissue via vascular and lymphatic systems to the rest of the body.

### Contaminants specific to Radiology

<table>
<thead>
<tr>
<th>Object/substance</th>
<th>Contaminant</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-ray tables</td>
<td>acinetobacter anitratum, s. epidemidis, klebsiella pneumoniae, micrococcus, aspergillus sp., staphylococcus aureus, streptococcus viridans</td>
</tr>
<tr>
<td>Face shields</td>
<td>baccilus sp, staphylococcus aureus, propionibacterium acnes, aspergillus sp., staphylococcus epidermidis</td>
</tr>
<tr>
<td>Waiting Areas</td>
<td>acinetobacter calcoaceticus , s. epidermidis, P. acnes, b. subtilise</td>
</tr>
<tr>
<td>Tourniquets</td>
<td>staphylococcus aureus, MRSA</td>
</tr>
<tr>
<td>Cassettes</td>
<td>staphylococcus aureus, Streptococci, MRSA</td>
</tr>
</tbody>
</table>

**Methods and Materials**

**METHOD**
• A purposive sample of all ROI and NSW mammography units was undertaken;
• Infection control protocols specific to mammography were requested;
• Questionnaires were sent to mammographers;
• **Observational study was undertaken to triangulate data with respondents and literature.**

Results

RESULTS

**Demographics:**

Respondents were experienced mammographers from both regions. No Irish screening units were included.

Irish radiographers were represented from the 4 main hospital types in Healthcare system.

NSW respondents were from hospital based (48%) and non-hospital based units (52%).

RESULTS AND DISCUSSION

**Infection Control (IC) Protocols:**

- General IC protocols available in 100% ROI units and 94% NSW units;
- 25% ROI/ 32% NSW had specific Mammo ICPs
- Protocols were accessible to radiographers in all ROI units but only to 43% of NSW radiographers.
- ICPs were displayed in 91% ROI units but only 17% NSW units.

*Policies for infection should be written, readily available and enforced and all staff members should be aware of and motivated to follow these policies.*

**Rating of knowledge and knowledge consistency:**

- 76% ROI radiographers rated both knowledge and consistency of adherence to specific ICP as excellent.
- NSW radiographers rated their knowledge as very good (45%) & excellent (41%) and their adherence consistency as very good (39%) and excellent (49%).

*Literature shows high perceived self-compliance but the reality is that transmission of infection is on the increase, NOT decrease!*
Reducing spread of infection:

Handwashing as a method of reducing cross-transfer of infection:

• Highest in staff to staff reduction of infection spread, but only rated 2\textsuperscript{nd} in patient to patient.

Equipment/area cleaning as a method of reducing cross-transfer of infection

• Highest in patient to patient transfer and 2\textsuperscript{nd} highest in staff to staff transfer BUT a low rating in patient to staff transfer.

*Handwashing is as reflected in literature rated as one of the most important issues in hospital infection control. Reduction in reservoirs of infection from room and area requires greater attention however - staff are acting as vectors for infection spread.*

Decontamination of units:

• Inconsistencies seen in the frequency of cleaning of certain key elements of the mammography unit and room.

• Parts of the equipment and mammography room that are consistently handled by the mammographers immediately prior to/post handling of the patients' skin are not consistently cleaned after each patient either in NSW or Ireland.

*Increased cross contamination and lack of efficient decontamination is possible in both ROI and NSW units.*

**Conclusion**

Infection control protocols specific to mammography units are required in ROI and NSW.

Availability and display of these may improve real knowledge and compliance.

Decontamination frequency and consistency needs uniformity and clarity.

Cleaning materials need to be unified and specified within NSW guidelines.

Documentation of the cleaning procedures may improve compliance and consistency.

Quality Assurance auditing of compliance, consistency and frequency is required.

*The possibility that mammogram units in Ireland and New South Wales are contributing to the overall bio-load of the hospital cannot be out-ruled.*
Infection Control procedures should be regulated with specific mammography infection control protocols within the QA process to prevent patient cross-infection with a consequent lowering of biological burden on hospitals/outpatient facilities.