Contamination of Laryngoscope Handles

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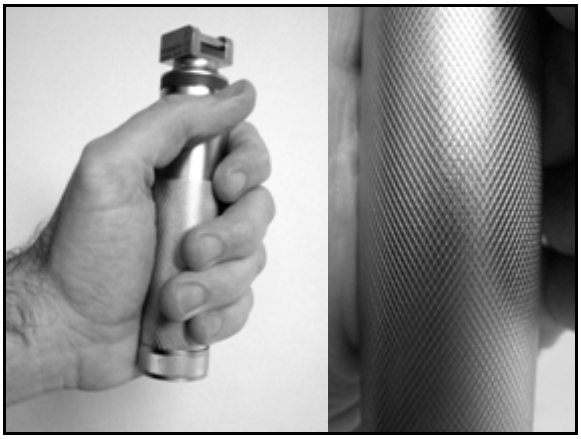
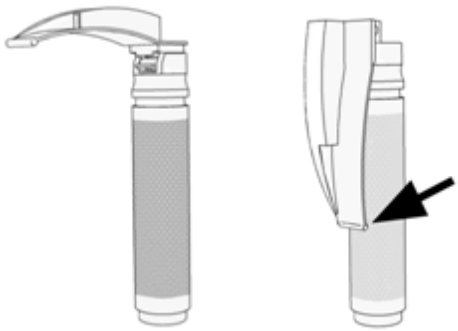
Background

- No clear local / national decontamination protocols
- Many widely used techniques inadequate [1,2]
- Contamination with [1,3-8]:
  - Organisms - ? MRSA, CJD
  - Blood – ? HBV, HIV
- Risk to patients & staff

Objectives

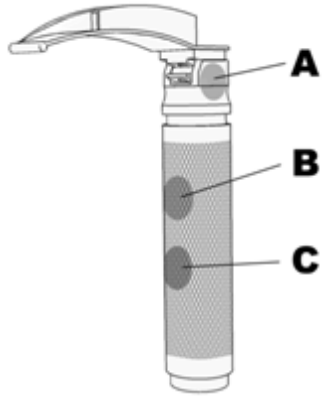
- Identify:
  Nature & extent of microbial and blood contamination on "ready for use" laryngoscope handles
- ? Association with:
  - design of laryngoscope handle
  - type of surgery

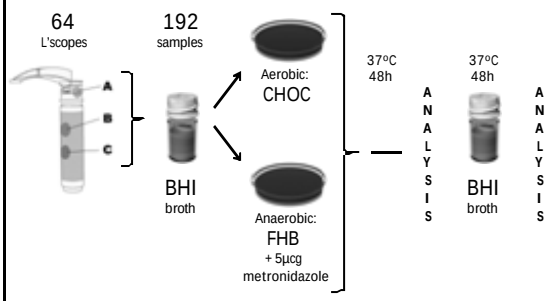




Methods

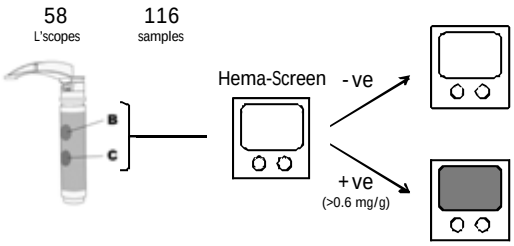
- Research & Ethics Committee approval
- Samples: 14:00 – 16:00 17-18 Nov 2008
- No advance notice
- All "Ready for use" handles
- 32 anaesthetic rooms
- Sterile technique: No touch / fresh gloves
- Sterile paper templates 2cm ∅ ~ 3cm^2





+ 3 control BHI broths with *H.inf* + *Cl.sporogenes*

- Blinding
- Growth:
  - Heavy: >20 colonies/plate
  - Medium: 11-20
  - Light: 5-10
  - Scanty <5
  - Enrichment only
- Type:
  - Routine methods
  - LT-MALDI-TOF Mass Spectrometer



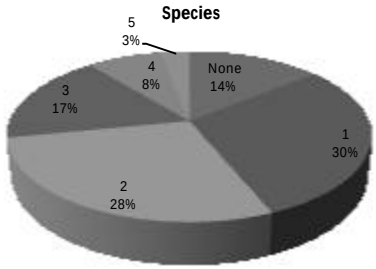
Results: Negative findings

- Anaerobes
- Fungi
- MRSA
- vancomycin-resistant enterococci
- multi-resistant Gm –ve bacilli
- Blood
  - ? no contamination
  - ? inadequate sensitivity
  - ? methodology

Extent of Contamination

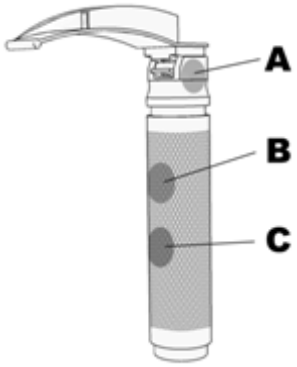
- 192 samples
- 99 positive cultures
- Mainly polymicrobial

- 64 laryngoscope handles
- 55 (86%) grew one or more species of aerobes:



Nature of Contamination

- 128 colonies
- 35 different species



33 (25%)

43 (34%)

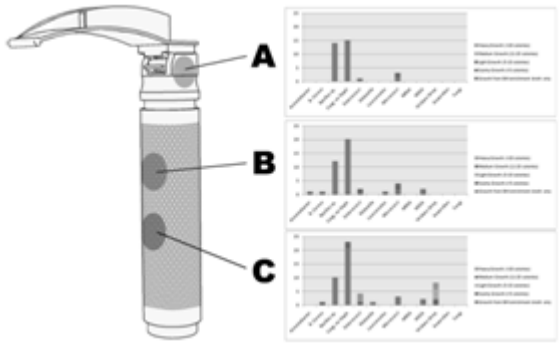
52 (41%)

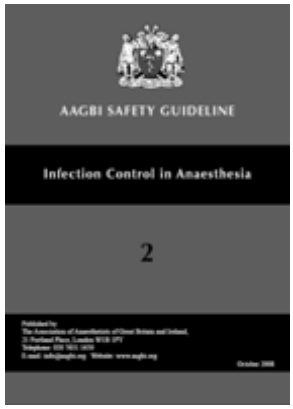
What organisms were grown?

- *Coag -ve Staph* most common
  - Hands of staff
- Airborne organisms
  - *B.cereus:* 9 (14%) handles, *micrococci* :2 (3%) handles
- Spore forming organisms
  - *B.cereus & bacilli sp* 38 / 128 (30%)
  - ? Selected by local policy of alcohol wipes
- Potential pathogens
  - *enterococci, MSSA, klebsiella, acinetobacter*

Where were organisms grown from?

- More species & heavier growth from knurled areas (B,C) cf. smooth areas (A)
  - ? due to increased handling
  - ? fissures = reservoir for organisms
- More species & heavier growth from contact point on knurled area (C) cf. other knurled areas (B)
- Oral flora (*S.viridans*) grown from contact point (C) only
- Potential route for pt-pt transmission of pathogenic bacteria / prions / blood
- No association with type of surgery / hospital site





Proposals

- High incidence of contamination (86%)
  - Effective national disinfection protocol
  - NB. Alcohol-resistant (spore forming) (*clostridia, B.cereus*)
  - ? New sterile handles for each case
  - ? Single use handles - ? Collect & recycle
  - ?? Disposable sheaths
  - ?? Bacteriostatic agents in handles (Ag^+ ion)
- Coag -ve *Staph*
  - Gloves / Hand hygiene protocols
- Airborne bacteria (*micrococci, B.cereus*)
  - ? Sealed packaging prior to use

- Redesign handles
  - avoid knurled / fissured grips
  - ergonomic design / polymer coating
- Redesign blade mount
  - ensure blade tip does not contact handle when folded in “off” position

References

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