



Meticillin-resistant *Staphylococcus aureus* in companion animals

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MRSA in pets - background

- Dogs and cats
 - *S. intermedius* (up to 90%)
 - *S. aureus* (<10%)
- Rabbits
 - *S. aureus*

MRSA in pets - background

- 1988 - Cat suspected as source of MRSA in geriatric ward
- 1989 – MRSA isolated from post-surgical wound infection in dogs (USA)
- Increasing numbers of publications late 1990s and 2000+
 - Background of worldwide human problem

MRSA in pets – why be concerned?

- Infections in animals
 - Cats, dogs, rabbits, exotics
 - Post surgical wound infections
 - Respiratory disease
 - Skin infections
 - Urinary disease

MRSA in pets – why be concerned?

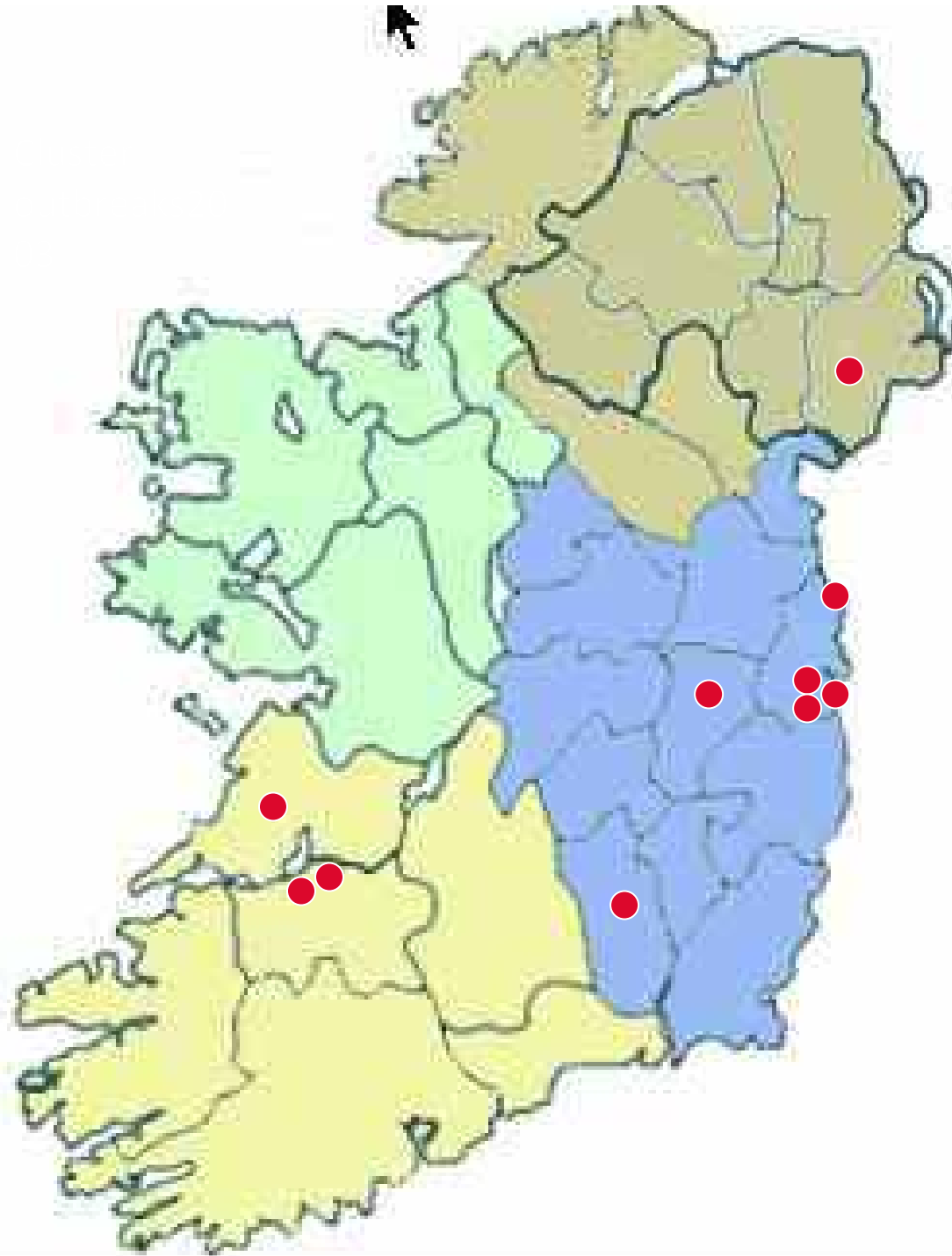
- Difficulty in treating multiresistant organisms
- Orthopaedic implants – biofilms?
- Carriage / colonisation
- Transmission to humans
 - Owners
 - Veterinary personnel

MRSA in pets – how big is the problem?

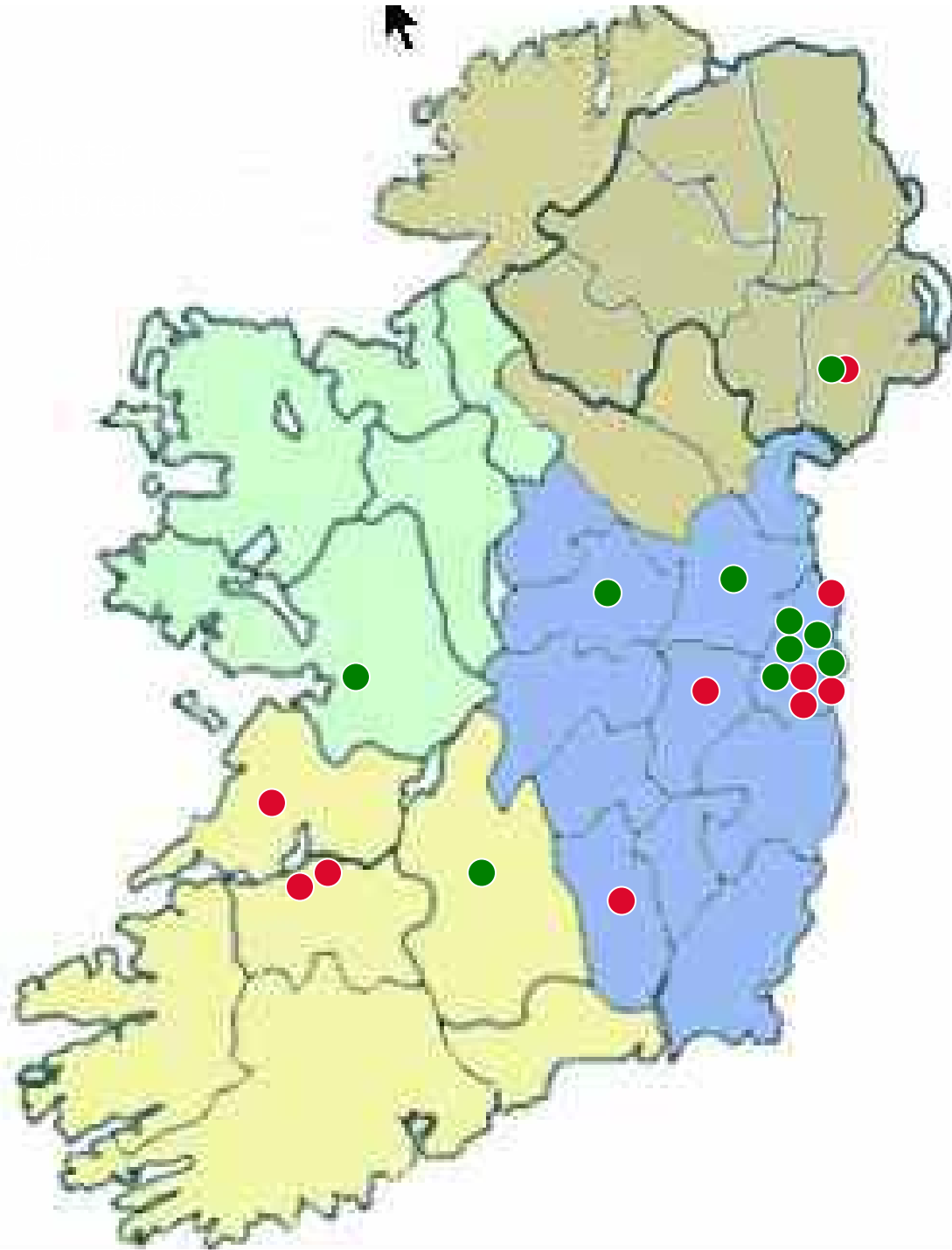
UCD

- Testing for meticillin resistance (5µg/disk) began 2001
- Two isolates in 2001
- First 'cluster' at the end of 2002
- Urban small animal practice
 - Submitted samples from 5 animals over a 4-month period which tested positive for MRSA

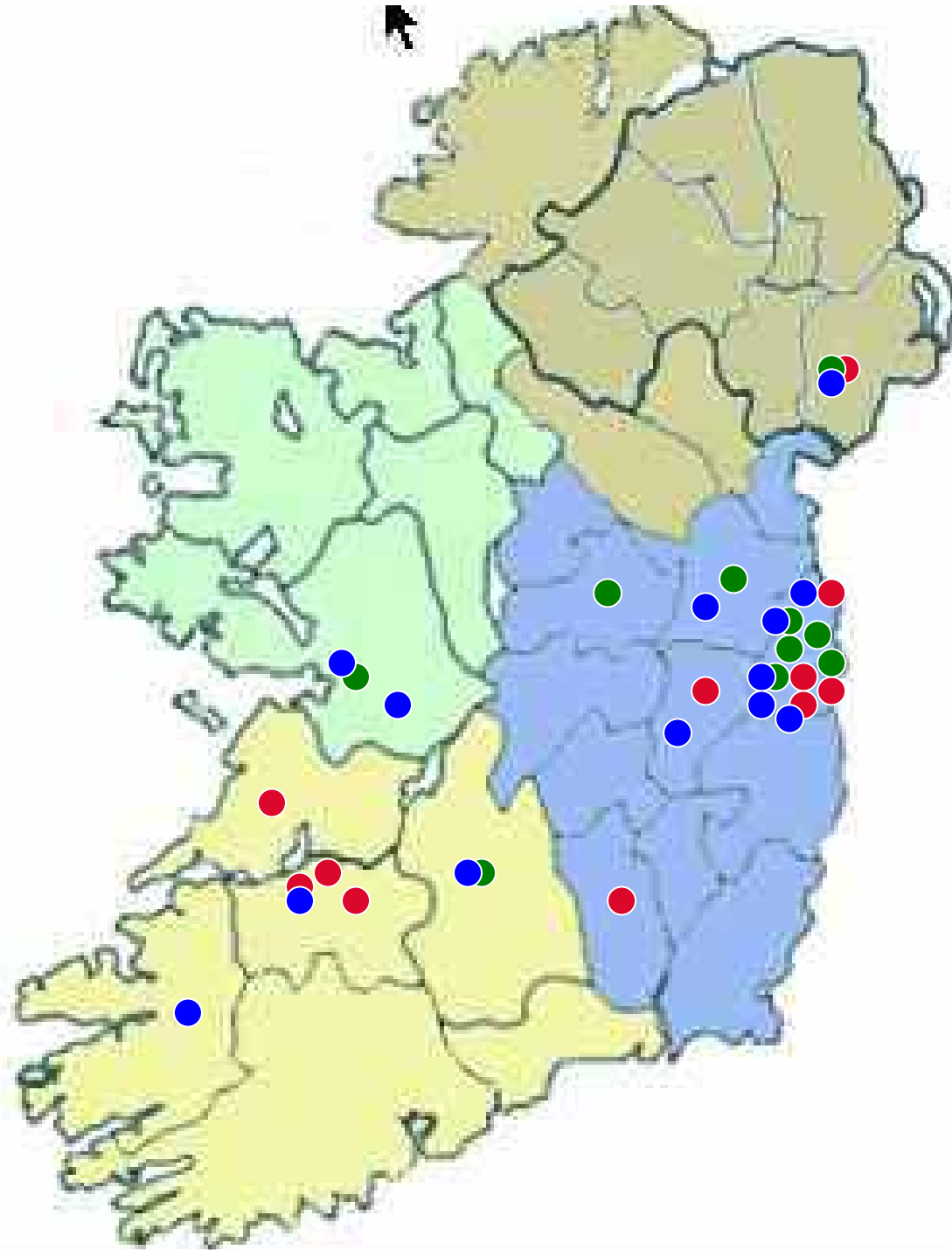
Clusters of
MRSA
infections,
2003



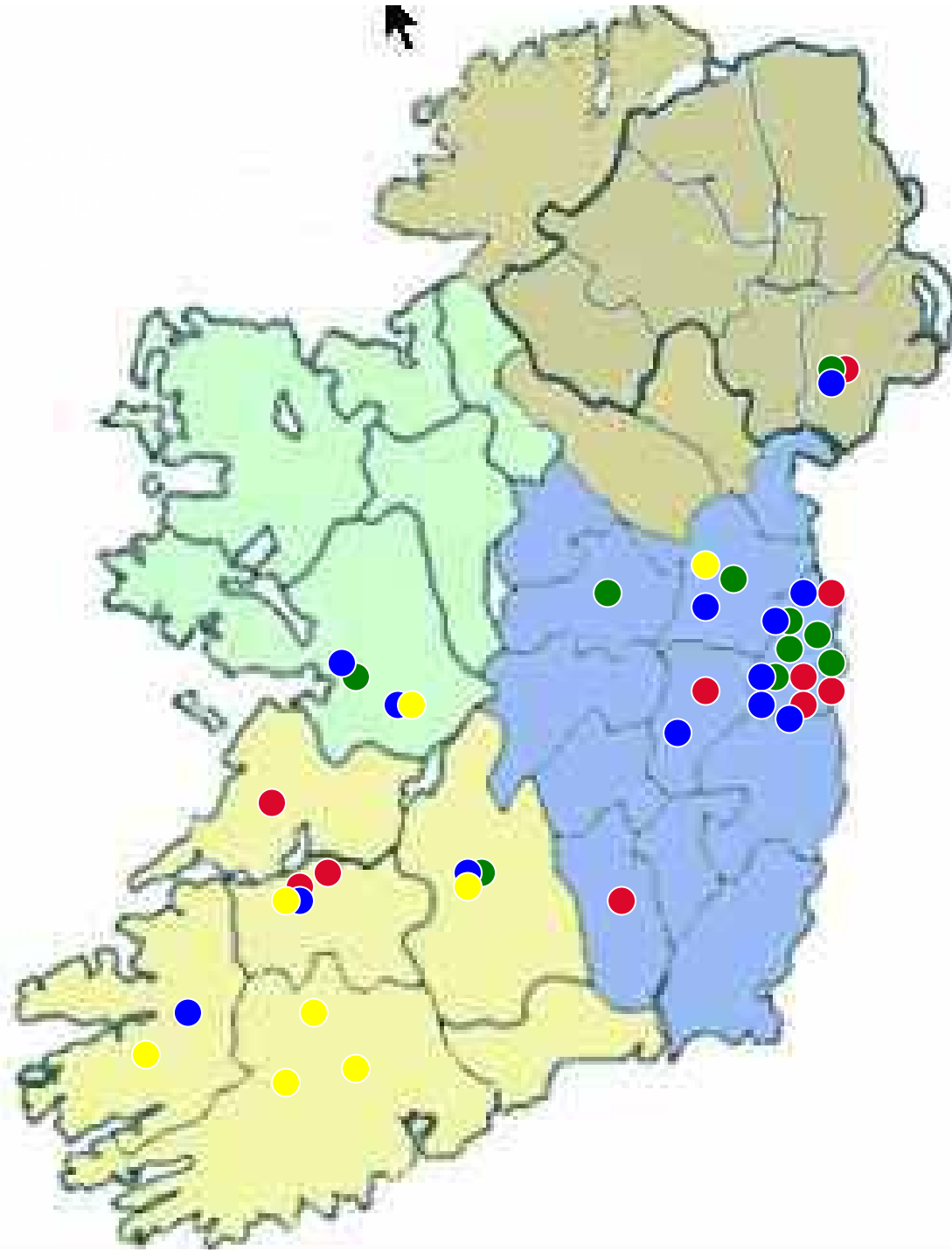
2004



2005



2006



How big is the problem in pets?

- Ireland
 - 13% dogs with clinical infections – referral hospital
 - 8% dogs with clinical infections
 - 0.6% healthy dogs
(Abbott et al. 2006)
- UK
 - 9% dogs sampled in RVC (Loeffler et al. 2005)
 - 1 of 255 healthy dogs (Rich and Roberts, 2006)
- Canada
 - 0.5% dogs sampled in Ontario VC (Hanselman et al., 2008)
- USA
 - 14% of patients in 7 vet colleges, 11% dogs (Middleton et al. 2005)

How big is the problem in vets?

- 17.9% of 78 staff in vet hospital (Loeffler et al., 2005)
- 4.4% small animal personnel at vet conference (Hanselman et al., 2006)
- UCD – clusters of MRSA infection in animals, vet personnel always colonised
- Owners with healthcare associations?

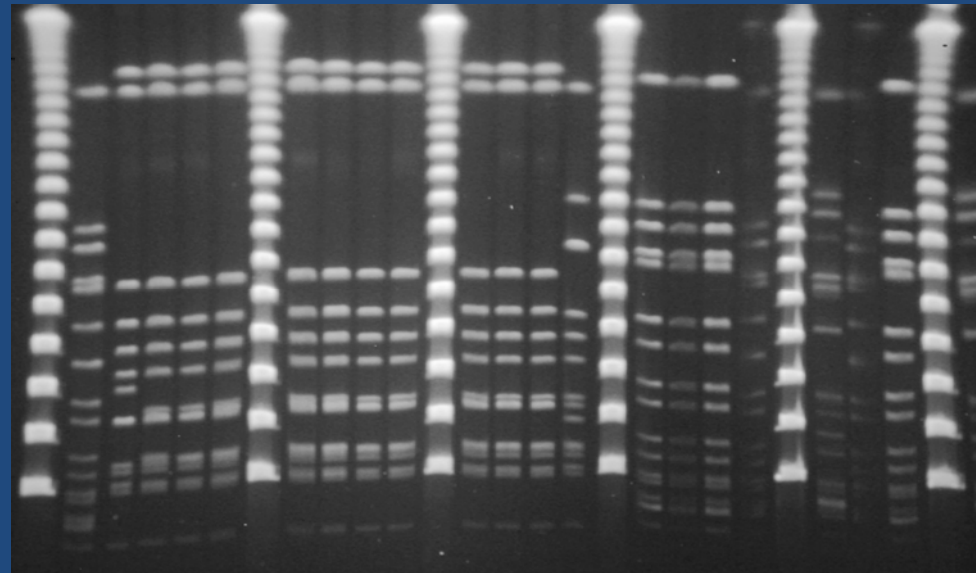
Proving the link

| Practice | Case | Species | Site | AR type | AR |
|----------|------|---------|-------|---------|--------------|
| B | 1 | Canine | Wound | 06 | ApCdCpErLnTe |
| B | 2 | Canine | Wound | 06 | ApCdCpErLn |
| B | 3 | Canine | Wound | 06 | ApCpErLn |
| B | 4 | Canine | Wound | 06 | ApCdCpErLnTe |
| B | 5 | Canine | Wound | 06 | ApCdCpErLnTe |
| B | 6 | Lapine | Wound | 06 | ApCdErLnTe |
| B | | Human | Nares | 06 | ApCdCpErLnTe |

(Leonard et al., 2006)

Proving the link

- MRSA typing
 - AR typing
 - MLST
 - *SCCmec*
 - *spa*
 - PFGE
- Small animal and human strains indistinguishable
 - UK, continental Europe, USA, Canada



spa typing

| Source | Sample type | PFGE type | <i>spa</i> type |
|--------|------------------------|-----------|-----------------|
| Human | Nasal | A1 | t032 |
| Dog | Wound | A1 | t032 |
| Dog | Wound | A1 | t032 |
| Human | Nasal | B1 | t064 |
| Horse | Abdominal granuloma | B1 | t064 |

Moodley et al., 2006

MRSA, pets and humans

- Origin of the problem?
 - Nosocomial infection in humans
- Transmission proven
- Direction?
 - both

Control of MRSA in small animals

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**GUIDELINES ON THE CARE OF PATIENTS WITH
METICILLIN RESISTANT *STAPHYLOCOCCUS AUREUS*
(MRSA)**

MARCH 2008 Version 2.0

Control of MRSA in pets

- Human guidelines
- Supporting data lacking
- Measures include:
 - Screening of animals?
 - Hand hygiene
 - Improved surgical procedures
 - Isolation, barrier nursing
 - Hygiene and disinfection
 - Screening of staff?

Summary

- MRSA in pets – reflects the problem in humans
- Clinical infections in pets
- Human to pet AND pet to human
- Emerging nosocomial infection in veterinary hospitals

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