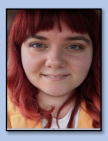
Veterinary Infection Prevention through Visualisation (VIPVis): Can infection in veterinary practice be reduced by using an educational simulation tool?



R. Thomas[1], K. Wyles[3], D. Subasinghe[1], A. Macdonald[4], M. Chambers[2], R. La Ragione[1,2]

[1] School of Veterinary Medicine, University of Surrey, Guildford; [2] School of Biosciences, Faculty of Health and Medical Sciences, University of Surrey, Guildford; [3] School of Psychology, University of Plymouth, Plymouth; [4] School of Design, Glasgow School of Art, Glasgow.

RT00542@surrey.ac.uk @Becky__Thomas

Funding provided by: zoetis, University of Surrey

Collaborators: The Glasgow School of Art, University of Plymouth

Infection prevention and control (IPC) is:

The behaviours and actions which control pathogen transmission to protect patients, visitors and staff from getting infected [2].

Antibiotic resistance (ABR) is:

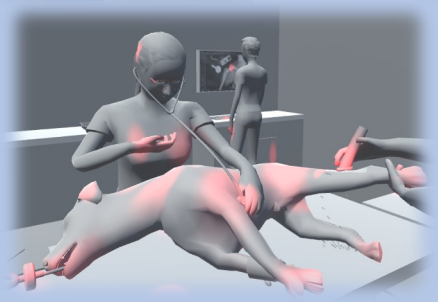
A bacterial organism evolves or acquires a resistance mechanism or tolerance to survive a previously effective antibiotic treatment [1].

Why is Antibiotic Resistance an issue?

- IPC can be challenging because resistant bacterial presence and spread is not visible to the naked eye and cannot be seen in our surrounding environment [3].
- Implementation of IPC measures is influenced by our attitude and understanding of IPC [3, 4]. There is a lack of effective communication and training tools for IPC education and implementation in clinical environments [3, 4].
- A lack of IPC may lead to more antimicrobial treatments being required, e.g. antibiotics, for treatment of preventable infection [3, 4].

What is VIPVis?

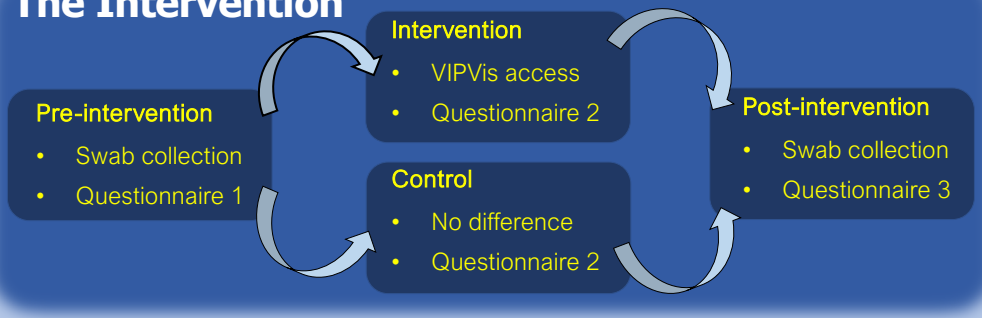
- Veterinary Infection Prevention through Visualisation (VIPVis) is an interactive App, simulating the indoor environment of a veterinary practice and the interactions taking place between humans, animals and pathogens [4].
- The animation has layers which simulate potential bacterial transmission:
  1) A contamination layer (red-shaded) to show the potential transfer of bacteria during preparation for surgery.
  2) An infection control layer (green-shaded) showing the minimised transfer of bacteria due to the preventative measures put in place.



The project aims

1) Evaluate the effectiveness of VIPVis at improving awareness of pathogen transfer methods and the need for improved IPC in a clinical environment.
2) Assess whether using VIPVis results in a change of implementation of IPC behaviours.
3) Measure if a change in IPC behaviour leads to a reduction in microbial presence throughout the veterinary practice environment.
4) Determine if a reduction in microbial presence reduces the requirement to prescribe antibiotics.

The Intervention



The project plan

- Collect swabs from environmental surfaces throughout companion animal veterinary practices.
- Establish the presence and abundance of key veterinary microbes from the collected swabs.
- Key bacterial isolates will be further analysed to identify the presence of any antibiotic resistance.
- Veterinary staff's understanding and attitude towards IPC will be measured using a series of questionnaires at different time-points.
- A pilot study to trial the above project plan is currently in progress to establish and confirm an effective and reliable methodology.

1. World Health Organisation.(2020). Antibiotic Resistance Fact Sheet [Online]. WHO. Available: https://www.who.int/news-room/fact-sheets/detail/antibiotic-resistance [Accessed 25/05/2022 2022].**2.** Pirbright Institute. (2020). https://www.Pirbright.ac.uk. Accessed 05.05.20.

2. Public Health England.(2017). Health matters: preventing infections and reducing antimicrobial resistance [Online]. GOV UK. Available: https://www.gov.uk/government/publications/health-matters-preventing-infections-and-reducing-amr/health-matters-preventing-infections-and-reducing-antimicrobial-resistance [Accessed 20/05/2022 2022].

3. Macdonald, A., Noble, S., Watson, F., Wales, A., Poyade, M., La Ragione, R., Chambers, M. & Wyles, K. (2019). Resistance movements: combatting infection risk in veterinary practice through visualisation method. Nordic Design Research Conference: Who Cares?, 2019 Aalto University, Espoo, Finland. pp 4.

4. Macdonald, A. S., Chambers, M. A., La Ragione, R., Wyles, K., Poyade, M., Wales, A., Klepacz, N., Kupfer, T. R., Watson, F. & Noble, S. (2021). Addressing Infection Risk in Veterinary Practice through the Innovative Application of Interactive 3D Animation Methods. The Design Journal, 24, pp 51-72.