

## UBS AWERB 3Rs Guidelines:

### Guidance and Advice supporting the single use of needles in UBS facilities

#### Introduction- Animal Welfare and Refinement

Most needles used in medical and biomedical facilities are “single-use” by design – for the purposes of durability and sterility (see Appendix 1).

The HO and the NC3Rs, and therefore UBS, are advocating that single-use needles by design are only to be used once – i.e., to be disposed of after entering only one animal – “as part of an establishment’s Culture of Care towards their animals” - see HO ASRU Annual Report 2018 (see Appendix 2), and NC3Rs blog (see Appendix 3).

#### Single-use of needles – why?

**Durability** – re-used needles increase the risk of tissue damage and trauma to the animal

**Compromises animal welfare**

**Sterility** – re-used needles are no longer sterile increasing the risk of transfer of pathogens across cohorts

**Compromises animal welfare;  
Introduces unknown variables**

The **University of Cambridge AWERB 3Rs Committee** would therefore like to pass on these **5 Top Tips** to its animal users to help support them in not needing to re-use single-use needles.

### 5 Top Tips

#### 1. Saving on lost injectable volume when changing needles

Needles contain an element of dead space within them, that needs to be emptied before removing the needle in order to conserve volume (Photo 1):



a)



b)



c)

Photo 1:

a) Initially draw up more than the required 0.2ml. Express the excess back into the bottle/ vessel so that 0.2ml is measured with a full needle – evident by the liquid bleb at the needle tip (see shadow). Always fill the needle so as not to inject air into the animal.

b) Pull all the liquid out of the needle into the syringe – change the now empty needle.

c) Push the liquid back up until the smallest bleb reappears at the needle tip (see shadow), and 0.2ml should have been conserved.

## 2. Low dead-space (LDS) needles and syringes

Chose to use needles and syringes designed to have a low dead-space:

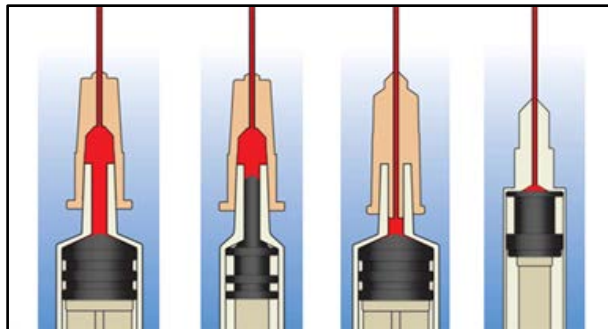


Figure 1: Examples of needle design from the highest dead-space (left) to the lowest dead-space (right).

Courtesy of NIHR ARC West

<https://arc-w.nihr.ac.uk/research/projects/low-versus-high-dead-space-syringes-user-preferences-and-attitudes/>

Please ask your NACWO for advice on supplying such items, if not supplied already.

## 3. Experimental design – run the animal cohorts in smaller batches

Running studies in smaller batches of animals could result in there being less distribution pressure on the liquid to be injected, such as cultured cells, in order to dose all mice. Running studies as rolling recruitment rather than bulk studies could help.

## 4. Growing cell cultures

Using multiple layered flasks can increase the surface area available for cell growth, without increasing the footprint in the lab, enabling upscaling of cell production and therefore volume.

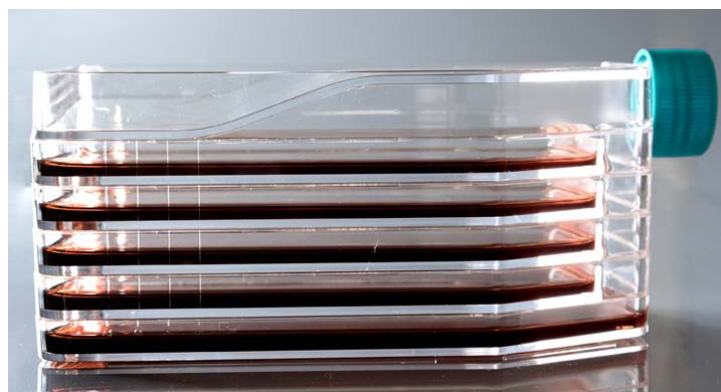


Figure 2: A typical 5-layer cell culture flask, courtesy of [www.cell-nest.com](http://www.cell-nest.com)

## 5. In-Development new technologies: NC3Rs CRACK-IT Challenge

“Active Needle Technology Ltd aim to develop a device using ultrasonic technology which minimises loss of material to dead space and improves animal welfare.” (See Appendix 4: NC3Rs CRACK-IT Challenge)

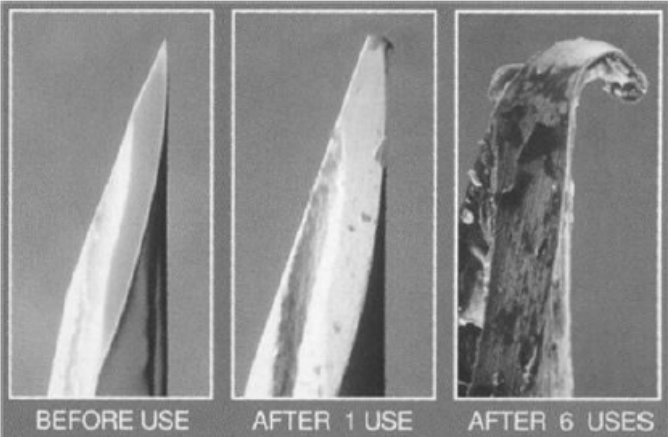
## Appendix 1: UBS Re-Use of Needles Poster

Shows the damage incurred by multiple needle uses, confirming the poor durability of single-use needles, when re-used.

# UBS Re-Use of Needles

## Are you still re-using needles? STOP!

- The harm caused by reusing a needle is much greater than any convenience or cost savings.
- The tips of needles may become damaged and infected after just one use.
- Even though you can't see this damage with the naked eye, it's still there –



BEFORE USE
AFTER 1 USE
AFTER 6 USES

"The practice of re-using single use hypodermic needles has implications for animal welfare.

During 2019, home office inspectors will be engaging with establishments during inspection visits to assess their current strategy for uptake of these refinements."

Will Reynolds  
Head of the Animals in Science Regulation Unit (ASRU) Home Office

**For advice and guidance please contact your named Veterinary Surgeon (NVS)**

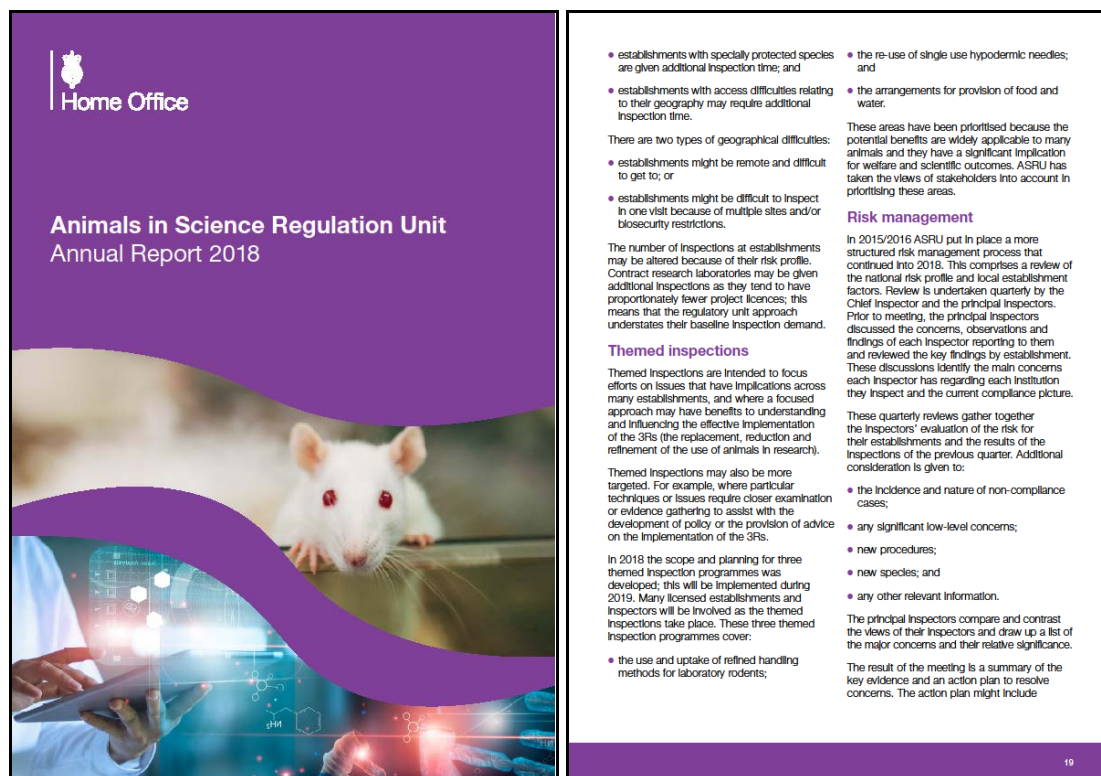


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## Appendix 2: HO ASRU Annual Report 2018

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/887289/Animals\\_in\\_Science\\_Regulation\\_Unit\\_annual\\_report\\_2018.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/887289/Animals_in_Science_Regulation_Unit_annual_report_2018.pdf)



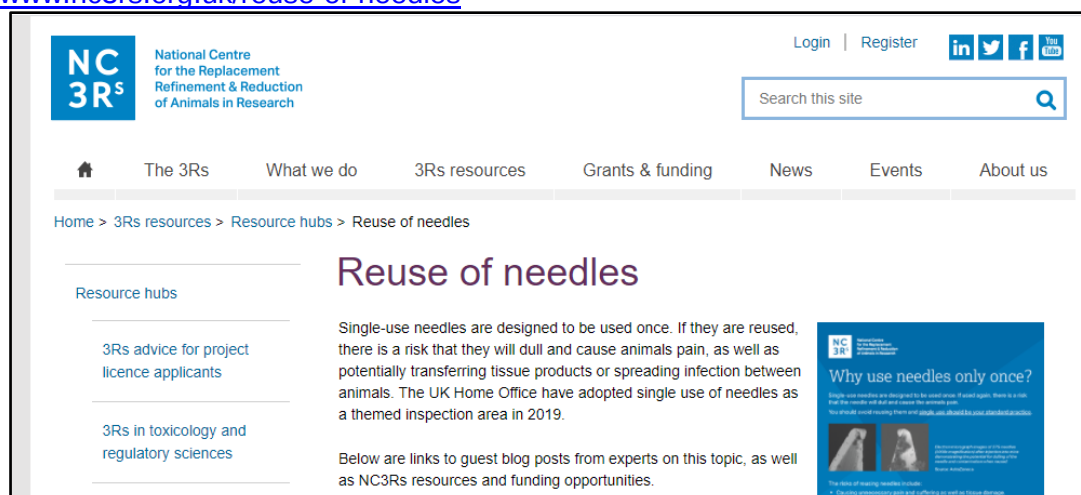
"Themed inspections are intended to... influencing the effective implementation of the 3Rs...

- the re-use of single use hypodermic needles;

...These areas have been prioritised because the potential benefits are widely applicable to many animals and they have a significant implication for welfare and scientific outcomes."

## Appendix 3: NC3Rs Blog

<https://www.nc3rs.org.uk/reuse-of-needles>



## Appendix 4: NC3Rs CRACK-IT Challenge

<https://nc3rs.org.uk/sharp-and-point-developing-device-injections-mice-avoids-re-use-needles>



The screenshot shows the NC3Rs website with the following content:

- Header:** NC3Rs logo, navigation links (The 3Rs, What we do, 3Rs resources, Grants & funding, News, Events, About us), and a search bar.
- Breadcrumbs:** Home > Our science > Search our science > Sharp and to the Point: Developing a device for injections in mice that avoids the re-use of needles
- Title:** Sharp and to the Point: Developing a device for injections in mice that avoids the re-use of needles
- Overview:**

Single-use disposable needles are often used throughout medical research involving animals for injecting substances or for collecting blood samples. Sometimes needles are re-used to reduce time and cost because of the involvement of large numbers of mice and/or expensive test material. However, the re-use of needles results in a loss of sterility and can increase the risk of infection and disease transmission between individual animals and between cages. Re-use also risks dulling of the needle, potentially increasing the pain and discomfort associated with subsequent injections. These concerns create confounding and unnecessary variables which can impact the quality of scientific data collected.

To address the Challenge, Active Needle Technology Ltd aim to develop a device using ultrasonic technology which minimises loss of material to dead space and improves animal welfare.

Full details of the Challenge can be found on the [Innovation Platform](#).
- CRACK IT Challenge:**
  - Status:** In progress
  - Contractor:** Mr Ian Quirk, Active Needle Technology Ltd
  - Sponsors:** AstraZeneca, GlaxoSmithKline, The University of Sheffield
- Footer:** Print this page, Back to top



The Challenge has been awarded to <http://www.activeneedle.com/> and is currently (August 2021) *In Progress*.