Hand Sanitiser Technology Guidelines

Dr Andrew Madden, Dr Sophie Rutter,
Dr Catherine Stones, Wenbo Ai

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Introduction
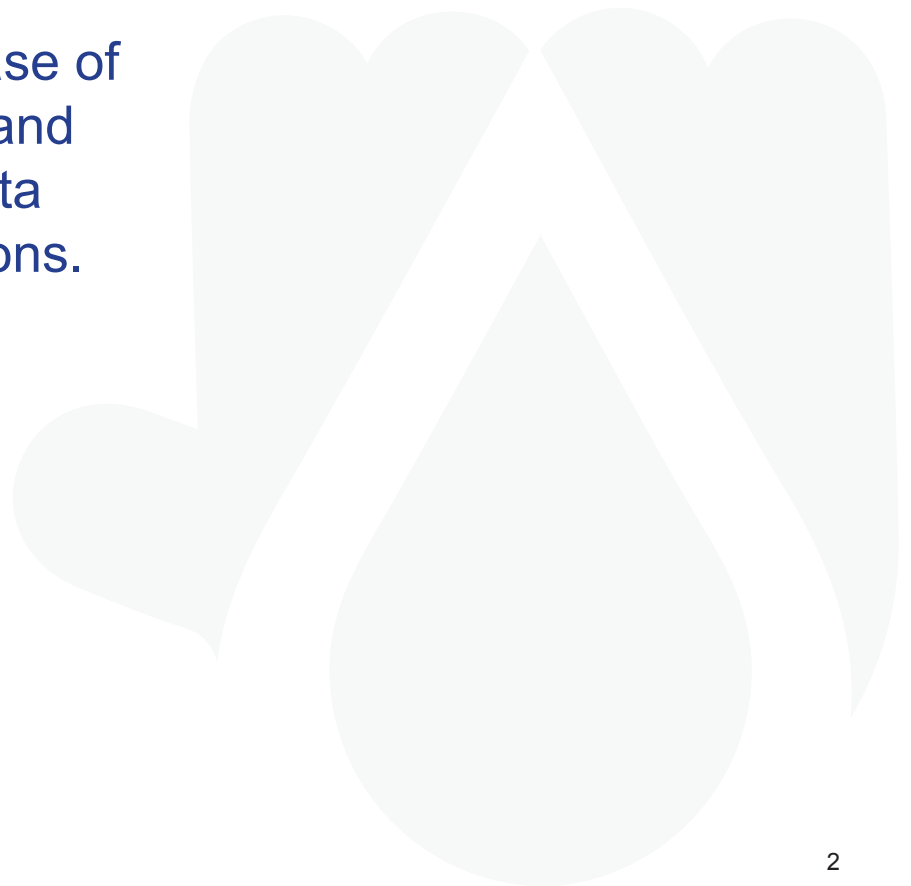
The importance of hand hygiene has long been recognised, but it is only in recent years that the use of alcohol-based cleaning gels has become widespread. With the increase in their use has come an increase in the range of technologies designed to dispense them.

The purpose of these guidelines is to offer suggestions to anyone considering the purchase of a hand gel dispenser, and to present research data relevant to their decisions.

Contents
- Source of power
- Sensors
- Volume of sanitiser gel
- Smart sanitisers

Power

When choosing the location of a dispenser, think about how you will power it.

The simplest gel dispenser is a 'hand-powered' plastic bottle. Clearly, this is only practical on a small scale. On a large scale, it becomes expensive and wasteful.
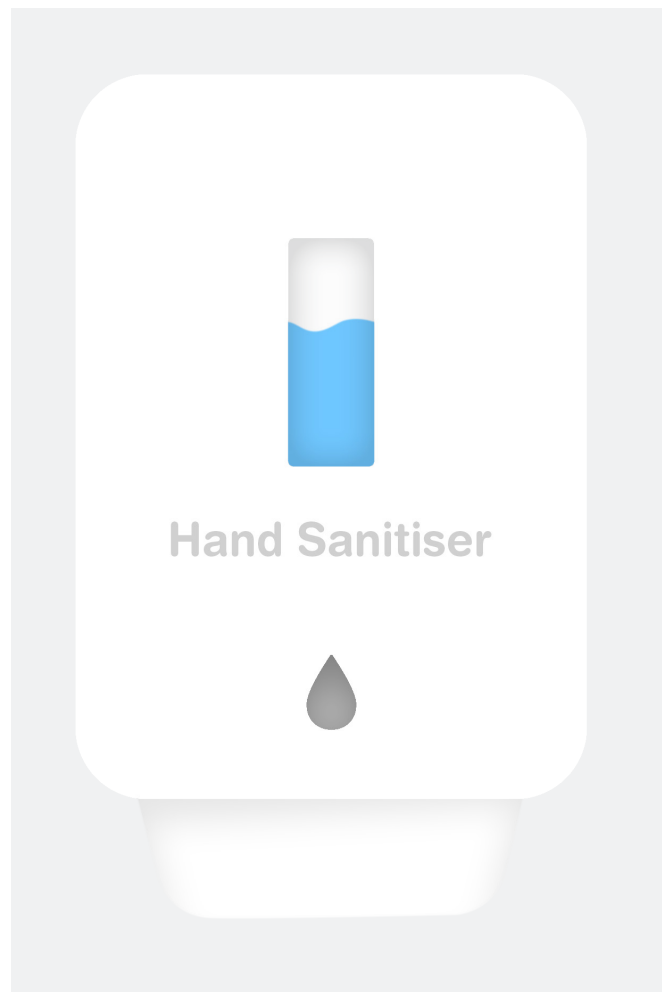
Where dispensers are intended for communal use, some form of hands-free mechanism is advisable since any form of manual release mechanism will lead to several hands touching the same spot, which can be a route for transmission of disease-causing organisms. The question therefore arises of how the release mechanism should be powered.

Will the dispenser be free-standing?
In many parts of the world, pedal operated dispensers are used. These have the advantage of needing no supply of electricity but they are susceptible to mechanical failure and may not be accessible to people with limited mobility. As an alternative, battery and solar-powered sanitisers are widely available and can be positioned in public spaces and at the entrance to buildings. Make sure they are firmly fixed in order to prevent theft.

Mains powered sanitisers
These are limited by the need to connect to a supply of electricity. However, because they draw on a greater source of power than free-standing dispensers, they can incorporate additional features. Mains powered sanitisers can include video screens, which give them the potential to communicate with users. They may also collect data, which can provide valuable insights into the use and functioning of the sanitisers.

Hand Sanitiser

Sensors

Be aware of the limitations of sensors

If you choose to install a powered, hands-free sanitiser, it will rely on feedback from sensors. These detect changes that indicate the presence of a hand, and respond by dispensing gel.

With all dispensers, it's important to think about where to position them [1], but if a dispenser has sensors, there are additional considerations. If such cases, before you decide where to put the dispenser, ask the vendor how it detects hands and what the optimal operating environment is for the sensors. This will help to prevent problems when the dispenser is installed. For example, sensors that detect motion by sensing changes in ambient light may not work well in poorly lit spaces, particularly if the users are dark-skinned [2].

SMART SANITISER

Gel

Make sure that sufficient gel is dispensed

Hand sanitisers deliver a fixed volume of gel each time the device is activated. Some however, allow settings to be changed so that the volume dispensed can be adjusted. This makes it possible to reduce expenditure by delivering smaller quantities of hand gel; but less gel may result in less clean hands. Studies have compared hand cleaning regimes based on 3ml of alcohol-based gel with regimes that used less. Volumes of 3ml proved far better at reducing numbers of bacteria on the skin [3], [4].

If you are buying a dispenser where the volume of gel delivered is pre-set, then before purchasing, test it with the kind of gel that you will be using. According to a recommendation by the US Center for Disease Control (later incorporated in World Health Organisation guidelines [5], p32), the ideal volume may vary for different formulations of hand gel. As a rule of thumb (and fingers!), WHO suggests that if hands feel dry after being rubbed together for less than 10–15 seconds, the volume of gel should be increased.

Smart sanitisers

HAND HYGIENE AT WORK

Potential benefits of Smart Sanitisers

Smart devices have the ability to gather, store and process data, and to share it with other devices across the Internet. They may require more effort to set up than other hand sanitisers but they offer many potential benefits, such as video displays and the ability to collect and share data. However, there are privacy and security issues associated with the collection of data, so it is essential to ensure that it is only used in ways that comply with General Data Protection Regulations (GDPR).

Prompts and reminders
The judicious use of well-chosen messages can play an important role in encouraging good hand hygiene practice [6]. Smart sanitisers allow them to be displayed to people while they clean their hands, giving the messages additional impact. Impact is further increased because messages can be changed frequently and can be combined with both static and moving images.

However, not all Smart sanitisers can be programmed at the point of use. In some cases, the timing and content of messages is organised centrally by the manufacturer of the device. This reduces the level of local control but it can simplify management, particularly in large organisations that use many hand sanitisers.

Use of data
Data collected by Smart sanitisers has the potential to answer some or all of the following questions:
- Which gel dispensers need refilling?
- Which gel dispensers require maintenance?
- How does location affect frequency of use?
- How does usage vary throughout the day?

In organisations where staff are required to wear RFiD identity badges, Smart sanitisers can also provide information about who uses the devices and at what times.

If an organisation can benefit from having regularly up-dated answers to some or all of these questions, then it may be worthwhile installing Smart sanitisers. However, before installing Smart sanitisers the organisation should engage with its staff. Efforts should be made to ensure that staff understand the ways in which Smart sanitiser data can improve hand hygiene within the workplace, and so help to reduce the spread of disease.

Limitations of data
If Smart sanitisers are capable of identifying users, the data must be interpreted judiciously. People can clean their hands in more than one way and there are circumstances in which a hand sanitiser is not the best way to maintain hand hygiene. Soap and water are better for people who need to remove visible dirt or who have skin problems that are exacerbated by alcohol-based cleaning gels [8].

Ownership of data

Internet of Things devices (such as Smart hand sanitisers) generate a wide variety of information through the anonymous measurement of usage. Collection and storage of such data are generally managed by the manufacturer and shared (through a secure client portal) with the organisation that uses the Smart device.

However, if the data collected by the organisation is linked to the use of RFID cards, then that data will remain within the organisation, and must be managed in ways that comply with GDPR.

Hand hygiene technique

Some Smart hand sanitisers currently in development are capable of revealing how well gel has been applied, by displaying unwashed areas of a user's hands. This is of value where particularly rigorous standards of hand cleaning are required, and for training employees in good hand cleaning technique [9].

References

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Please email: s.rutter@sheffield.ac.uk