

Evidence Review

iGENE voice warning system

CEP 07001



Verdict

-  RECOMMENDED
-  SIGNIFICANT POTENTIAL
-  EVIDENCE INCONCLUSIVE
-  NOT RECOMMENDED

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The product

iGENE Voice Warning System, manufactured by Adroit Global Technologies (1).

Field of use

The iGENE is a device that uses voice warning technology to remind people to wash their hands. The device is intended for use in any area where good hand hygiene is essential. Adroit provides the following examples:

- toilet areas
- hand wash basin areas
- waste disposal areas
- washrooms
- clean rooms
- restaurants
- Commercial kitchens.

This review focuses on the application of the iGENE device to the clinical setting where the aim of the device is to remind medical and non-medical staff to wash their hands and contribute to reducing the incidence of hospital acquired infections (HAIs). The application of this device is set against a background where numerous policies have been put into place to increase hand-washing awareness and compliance. While good hand hygiene is an effective yet simple means of infection control, it is a practice that is often neglected.

Evidence reviewed

There is insufficient evidence in the literature to make a judgement on the effectiveness of this system (or similar systems). At present it appears that such devices are hardly used in clinical environments. While it is generally agreed that hand hygiene practices in hospitals need to improve, it has not been established that iGENE can positively contribute to this improvement.

CEP's verdict – **evidence inconclusive**

There is insufficient evidence to draw conclusions on the effectiveness of voice warning systems in healthcare or other areas. Controlled user trials are required in order to determine whether they can contribute significantly to improving standards of hygiene in the healthcare environment.

iGENE is a voice warning system presented in the form of a wall mountable unit shown in Figure 1. The device can be programmed with any voice message which is then played back upon the detection of movement. The iGENE device reminds people to wash their hands and is designed for any area where hand washing is essential.

This review examines the application of iGENE within the health service and in particular (as claimed by the manufacturer) in relation to the reduction of HAIs such as MRSA (Methicillin Resistant *Staphylococcus Aureus*)

For this evidence review, studies on voice warning systems were researched using keywords such as 'voice warning systems' 'vws technology' 'voice prompt systems, voice alarm systems (and using devices instead of systems) using www.highwire.org. Studies on current hand washing policies were researched using keywords such as 'hand washing policies', 'Hand washing compliance in healthcare', 'Hand hygiene', Psychology of hand washing, 'hand washing behaviour' using www.highwire.org

Figure 1: The iGENE device



With permission from Adroit Technologies

iGENE specification

The iGENE is a passive activated infrared sensing device having a 10-metre detection range with a 90-degree 'angle of view'.

Approximately 15 seconds after iGENE detects the presence of a person it will issue a voice warning announcement as a gentle reminder in the interest of hygiene. By way of example *'In the interest of hygiene we would respectfully remind you to wash your hands before leaving the area'*. After issuing this announcement iGENE will shut down for 4 minutes after which time it will become active again. When anyone walks into the detection zone it will repeat the sequence of operation.

A signal lamp (LED) on the front of iGENE provides 2 functions:

- On power up the LED will flash continually until iGENE is ready to operate. This normally takes approximately 1 minute. This is the time it takes to stabilise the passive element of the detection device. Once the signal lamp extinguishes iGENE is ready for operation and at this time it may play the warning announcement. In some situations such as cold areas iGENE may require more time to stabilise; this could take up 3 minutes.
- In its normal operation (when iGENE detects a person in its detection zone) the LED will flash momentarily, signifying detection has taken place and the operation sequence is initiated. When the battery begins to run low iGENE will issue a voice-warning message, to indicate this for example *'My battery is running low, change the battery immediately'*. This message will be repeated several times or until the battery is well below operational use.

Overview of handwashing compliance issues

The importance of health workers following good hand hygiene practice has been highlighted by various organisations but this simple procedure is often ignored. This is clearly illustrated in the Tibbles study (2), where over a 25 week period the handwashing rate among 61 medical staff who washed their hands both before and after patient contact ranged between 4.3 and 55.2%. This is relevant to many areas in the hospital including washrooms, visiting areas, catering/kitchens, wards, clinics, diagnostics, theatres.

There is strong evidence to suggest that there are more factors contributing to hand hygiene than just simply forgetting to wash the hands. Factors contributing to the non compliance comprise a complex combination of ignorance, workload, work culture, habit and attitude (3 - 8).

Handwashing compliance policies are encouraged in hospitals through various educational initiatives. This often includes campaigns using poster and badges though these can be ineffective and the way a message is worded is important in achieving compliance (9, 10). There are a number of techniques used to "dress up" (or frame) a message, including a 'gain

frame' message which shows an individual what they can gain by carrying out the required action (11). These issues may also apply to spoken messages.

Behaviour is a major influence on compliance. The theory of planned behaviour (12) which was adapted from the theory of reasoned action (13) assumes that individuals are motivated to process and respond to relevant information. However, Bartzokas (10) found no evidence for this in the case of hospital staff (perhaps due to the high workload). Motivational factors are also considered as determinants of behaviour change (14). Individuals are more likely to heed the iGENE device message if there is a consequence. This might be through formal compliance monitoring or due to the potential for embarrassment depending on who else is in the area (8).

The lack of handwashing compliance amongst medical staff was further highlighted in a study carried out by Bischoff *et al* (5) where out of 1575 direct opportunities for hand washing (over a period of 120 hours) the compliance was found to be 9% and 22% before and after defined events respectively for health care workers in Intensive Care Unit (ICU) and 3% and 13% for health care workers in cardiac surgery ICU. Bischoff *et al* arrive at the conclusion that education/feedback intervention awareness programmes fail to improve handwashing compliance and in their report state that the introduction of easily accessible dispensers has significantly contributed towards increased hand washing compliance.

A study carried out by Pittet *et al* (4) concluded that workload contributed to handwashing compliance; out of 2800 observed hand washing opportunities on multiple wards there was found to be an average of 48% compliance. Generally compliance was observed to be less in physicians groups than in nursing groups and less at weekends than on weekdays. This may be due to the fact that nurses have more patient contact than physicians and also behavioural changes at weekends (when fewer staff are present). Pittet concluded that the variation across hospital ward and type of healthcare worker suggests that targeted educational programmes may be useful.

Evidence for iGENE

It is accepted that good hand hygiene plays an important part in the control of healthcare associated infection. Although campaigns to influence staff behaviour may be effective, there is little general evidence to support the use of voice warning systems, and we were unable to find any peer-reviewed publications to support the application of such systems within the healthcare environment.

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IGENE voice warning system: Evidence review

Galit Gonen, Keith Perry

Microbiological Diagnostics Assessment
Service
Evaluations and Standards Laboratory
Health Protection Agency – Centre for
Infections
61 Colindale Avenue
London NW9 5EQ

Tel: 020 8327 6949

Fax: 020 8327 6009

E-mail: midas@hpa.org.uk

For more information on evaluations related
to microbiology
visit www.hpa-midas.org.uk

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Centre for Evidence-based Purchasing
Room 152C, Skipton House
80 London Road
SE1 6HL

Tel: 020 7972 6080

Fax: 020 7975 5795

Email: cep@pasa.nhs.uk

www.pasa.nhs.uk/cep