

USE OF AI TO ENFORCE COMPLIANCE – HAND HYGIENE

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What is Hand Hygiene?

Clean care for all – it's in your hands:

WHO calls on everyone to be inspired by the global movement to achieve universal health coverage (UHC), i.e. achieving better health and well-being for all people at all ages, including financial risk protection, access to quality essential health care services and access to safe, effective, quality and affordable essential medicines and vaccines for all. Infection Prevention and Control, including hand hygiene, is critical to achieve UHC as it is a practical and evidence-based approach with demonstrated impact on quality of care and patient safety across all levels of the health system.

Monitoring hand hygiene adherence serves multiple functions: system monitoring, *incentive for performance improvement*, outbreak investigation, staffing management, and infrastructure design.

Levels of Hand Hygiene promotion and practice:

Inadequate: hand hygiene practices and hand hygiene promotion are deficient. Significant improvement is required.

Basic: some measures are in place, but not to a satisfactory standard. Further improvement is required.

Intermediate: an appropriate hand hygiene promotion strategy is in place and hand hygiene practices have improved. It is now crucial to develop long-term plans to ensure that improvement is sustained and progresses.

Advanced: hand hygiene promotion and optimal hand hygiene practices have been sustained and/or improved, helping to embed a culture of safety in the health-care setting.

Score	
Component	Subtotal
1. System Change	
2. Education and Training	
3. Evaluation and Feedback	
4. Reminders in the Workplace	
5. Institutional Safety Climate	
Total	



Total Score (range)	Hand Hygiene Level
0 - 125	Inadequate
126 - 250	Basic
251 - 375	Intermediate (or Consolidation)
376 - 500	Advanced (or Embedding)

What actually works:

To achieve and sustain good score, the five components, System Change, Education and Training, Evaluation and feedback, Reminders in workplace, Institute safety climate are crucial which are possible only by enforcement of processes.

Does employing secret shoppers really work?

Monitoring via secret shoppers may help to get to 'Intermediate' level but cannot help further.

Solution using AI:

We have an evidence based solution to achieve the 'advanced' level in 'Hand Hygiene promotion and practice' program.

Our solution records the videos using a motion sensor camera, detects the persons and their actions, calculates the durations of their actions and trigger an alert if the duration is less than the defined values. This helps in improving the scores significantly.



A screenshot of a dashboard interface. On the left is a sidebar menu with categories like 'CONFIGURATIONS', 'CAMERA CONFIGURATION', and 'EXTRAS'. The main area features a table with columns for 'Label Name', 'Condition', 'Duration', and 'Time In'. Each row includes 'Update' and 'Delete' buttons. A search bar is located at the top right of the table area.

Label Name	Condition	Duration	Time In	Update	Delete
Room	<	2	Sec	Update	Delete
Indoors	<	4	Sec	Update	Delete
Coat	<	3	Sec	Update	Delete
Doctor	=	0	Sec	Update	Delete
Human	<	5	Sec	Update	Delete
Hospital	<	1	Sec	Update	Delete
Lab Coat	<	1	Sec	Update	Delete
Clothing	<	1	Sec	Update	Delete
Washing	>	15	Sec	Update	Delete
Female	>	2	Sec	Update	Delete

Figure 1. Pictorial presentation of AI process.

All the hand washes are recorded using IP cameras and stored in cloud for further analysis. The stats of events along with classification of events are assessed and displayed in dashboard.

Benefits of our solution:

1. Helps to achieve the goal of 'Advanced' Level of Hand Hygiene promotion and practice.
2. Seamless integration, analysis and reports.
3. Helps to incorporate good hand hygiene processes those reduces the risk of things like flu, food poisoning and healthcare associated infections being passed from person to person.
4. Eliminating ineffective method of secret shoppers.
5. Decreasing the training costs to the hospitals
6. Scalable and easy maintenance of program.

Software Cost:

1. This is cloud based software that saves huge hardware costs.
2. We are non-profit and our aim is not minting dollars from clients but providing quality services at very reasonable costs.
3. \$ 300 per person per month participating in the program. Minimum charge per month is \$2000.
4. We assume this is less than the cost of employed secret shoppers or extra benefits given to volunteers for this job.

Math per person: \$9 per hour per person for 200 hours a month totals to \$1800.

Implementation Cost:

1. Deploy motion sensor IP cameras to capture videos. Cost of a good camera ranges between \$ 90 and \$150.
2. A virtual machine that hosts and runs our software.

Note: We can analyze any pre-recorded videos as well.

FAQ:

1. Is this safe?

Yes, it is. No patient information involved. Does analysis and recognizes people who are pre-defined in the system. Rest are ignored.

2. Is this scalable?

Yes, new users can be added on the fly. Administrator can control all the settings. No vendor involvement required unless there is a question.

3. How does this help improve the scores?

This analyzer motivates people to follow a routine and thus helps to achieve the goals and improve scores.

4. How is this better than the current manual process?

When monitored manually, chances of un-intentional skips, errors, delays are common which can be avoided via this automated process. Also, government mandates the proof which is possible with our solution.

FAQ cntd...:

5. Is this real-time?

It is near real time. The analysis has to be done after the recording is complete. So, there is a 5 minute delay. This helps establish monitoring and motivate people to follow routine.

6. Does it send alerts?

Yes, it does. Alert levels and configuration can be controlled by administrator. Any conditions that fails the criteria are alerted to the supervisor. Reports are available via a dashboard.