

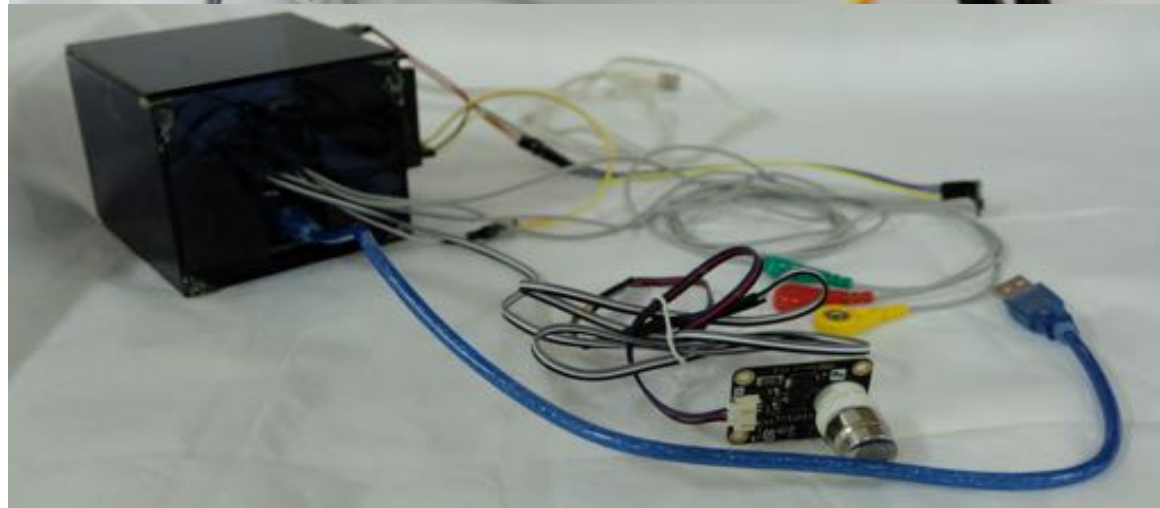


KEMENKES RI

**farmalkes**

# Portable Wireless Monitor

Departemen Anestesi dan  
Terapi Intensif  
FK Unair – RSUD dr Soetomo





Departemen Anestesiologi dan Reanimasi RSUD Dr. Soetomo  
Fakultas Kedokteran Universitas Airlangga Surabaya

**Farmalkes**



# BLACK BOX VL-Scope

Inovasi Videolaryngoscope  
Kualitas Mercy Seharga Panci

oleh:

**Soni Sunarso Sulistiawan, dr., Sp.An.FIPM**

(korespondensi: [soni.sunarso.s@gmail.com](mailto:soni.sunarso.s@gmail.com))

**Bambang Pujo Semedi, dr., Sp.An.KIC**

**Dr. Arie Utariani, dr., Sp.An.KAP**

Nomor paten

**P00201609054**

28 Desember 2016

dipresentasikan pada: Technofarmalkes





IndoHCF Innovation Awards



Geografis kepulauan  
Era JKN

Jumlah Dokter masih  
terbatas

Demographic Dividend

Revolusi 4.0

Inilah  
Indonesia.....

# Contoh kasus..

- Seorang laki-laki 50 tahun tiba-tiba pingsan, keluarga menelpon ambulans untuk pertolongan, petugas ambulans (paramedic) datang dan memberikan bantuan. Mereka menduga adanya gangguan irama jantung, namun kesulitan dalam diagnosis dan terapi karena keterbatasan keahlian.
- Permasalahan :
  - First responder mungkin tidak memiliki cukup keahlian
  - Jumlah dokter ahli terbatas
  - Pasien gawat bisa dimana saja



# Gambaran Penggunaan Klinis



Command Center

# Portable Wireless Monitor

**Keunggulan**

- Wireless
- Easy Power Source
- Easy Access (Dapat Diakses Dari Jarak Jauh)
- Dapat Mendeteksi Gelombang EKG, SpO<sub>2</sub>, dan End Tidal CO<sub>2</sub> (Gold Standard Intubasi)
- Murah dan Low Maintenance Cost

- Untuk Monitoring Pasien Rujukan Dengan Ambulance Jarak Jauh
- Untuk Konsultasi Jarak Jauh Saat Terjadi Kegawatan
- Mendukung Sistem SPGDT dan Code Blue

Department of  
Anesthesiology and Reanimation  
Faculty of Medicine  
Universitas Airlangga

Rencana pengembangan

Mulai melakukan riset

Penggunaan pada MRI → pemecahan permasalahan Farady Cage

Penggunaan handphone sebagai media transmisi → android system

Pengembangan pada sistem pendukung SPGDT dan Code Blue

sehingga lebih meningkatkan patient safety

# First Clinical Evaluation of Airlangga University Self-Made Video Laryngoscope During Routine and Emergency Intubation : A Preliminary Study

Windy Airl Wijaya<sup>1</sup>, Nyoman Yesua<sup>1</sup>, Sani Sunarso Sulistiawan<sup>1</sup>, Bambang Pujo Semedi<sup>2</sup>, Arie Utariani<sup>3</sup>

<sup>1</sup> Resident, Department of Anesthesiology and Resuscitation, Faculty of Medicine Airlangga University, Dr. Soetomo Hospital Surabaya, Indonesia  
<sup>2</sup> Consultant, Department of Anesthesiology and Resuscitation, Faculty of Medicine Airlangga University, Dr. Soetomo Hospital Surabaya, Indonesia

## BACKGROUND

- ▶ Video laryngoscope is beneficial for airway management.<sup>1,2</sup>
- ▶ Many airway devices being used today are very expensive.
- ▶ We developed self-made video laryngoscope with low price.
- ▶ For less than 2 millions IDR, we can have video laryngoscope with high accuracy and high audio visual quality to record endotracheal intubation process.
- ▶ It helps us to teach the intubation process for residents.

## OBJECTIVES

To evaluate the time needed to get vocal cord and glottic view with Airlangga University self-made video laryngoscope in 10 intubations at dr. Soetomo General Hospital in July 2016

## MATERIAL AND METHODS

- ▶ Airlangga University self-made video laryngoscope was made from a disposable plastic laryngoscope combined with an endoscopic camera. The audio-visual output was displayed via notebook using a webcam companion program.
- ▶ Ten patients (PS ASA 1-3) with malampathy 3 undergoing elective surgery in supine position with general endotracheal anesthesia were included in the study. Patients with any pathologies of the upper respiratory or alimentary tract were excluded.
- ▶ Standard monitoring devices were attached before induction of anesthesia, including non-invasive blood pressure, ECG, and pulse oximetry. The patient's head was supported with a firm pillow in a sniffing position. After 5 minutes of preoxygen with face mask, general anesthesia was induced with fentanyl 2 mcg/kg, propofol 2 mg/kg, and rocuronium 0.6 mg/kg.

## RESULTS

Table 1. Patients Characteristics

Age ( Years )	41.6 ( 19 - 54 )
Sex ( Female/Male )	( 4/6 )
Body Weight	72.6 ( 62-83 )
Malampathy Class I/II/III/IV	( 0/9/10/0 )



Fig. 1. Time to view vocal cords.

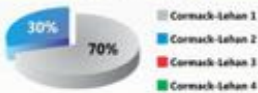


Fig. 2. Cormack-Lehman Values



Fig. 3. Airlangga University self-made video laryngoscope and the intubation process



Fig. 4. Vocal cord pictures taken with Airlangga University self-made video laryngoscope

## DISCUSSIONS

- ▶ Video laryngoscope is beneficial during intubation.<sup>3</sup> It was first invented to ensure successful intubation in patient with predicted difficult airway. Recently, the paradigm has enhanced onto lesser time of unprotected airway.<sup>1,2</sup>
- ▶ Popular video laryngoscopy devices are relatively unaffordable for anesthesiologist. Hence we want to reinvent this system with apparatus which is easy to find yet a lot cheaper.
- ▶ In order to ensure safety profile of our video laryngoscope, we conducted a preliminary study measuring average time-to-view vocal cord, and Cormack-Lehman values, while standard video laryngoscope be able to achieve 5-16 seconds time-to-view vocal cord.<sup>4</sup> Our device could also achieve relatively similar result 7-23 seconds time-to-view vocal cord. Another benefit of using our video laryngoscope was great view of glottis with Cormack-Lehman scale ranging from 1 to 2.
- ▶ Due to different population and lesser subjects, this result does not completely states superiority of our device, but rather improves us to do further larger studies.

## CONCLUSIONS

- ▶ Airlangga university self-made video laryngoscope enhances time to view vocal cord and provides great view of glottis comparable to standard video laryngoscope. Fast vocal cords views resulted in successful tracheal intubation during routine and emergency induction of anesthesia.
- ▶ Its audio-visual records helps the anesthesiology department to track their intubation lesson for every single residents, all the records can be stored at personal computer.

## REFERENCES

- Murphy JD, Kessels GJ, Rowden PG, et al. Comparison of the King Video laryngoscope with the Macintosh laryngoscope. *J Emerg Med* 2014;67:20-6.
- Ryhalo C, Beer T, Zacharowski K, et al. Tracheal intubation using the multi-*C-MAC* video laryngoscope or direct laryngoscopy for patients with a simulated difficult airway. *Minerva Anestesiol* 2016;76:1071-81.
- Conan E, Rivikbacher J, Shogren T, et al. The C-MAC video laryngoscope: first experiences with a new device for video laryngoscopy-guided intubation. *Anesthesiology* 2012;116:473-7.
- McWhorter J, Mulla SA, Harris BE, et al. Comparison of the C-MAC video laryngoscope with the Macintosh, Glidescope, and Airway laryngoscopes in easy and difficult laryngoscopy scenarios in manikins. *Anesthesiology* 2013;81:883-9.
- van Zundert A, Muijsers K, Wei R, et al. A Macintosh laryngoscope blade for video laryngoscopy without stylet use in patients with normal airways. *Respir Intensiv* 2009;109:825-31.
- Conan E, Neumann T, Shogren T, et al. First clinical evaluation of the C-MAC D-Blade video laryngoscope during routine and difficult intubation. *Anesth Analg* 2011;112:715-21.

- ❑ Intubasi pada berbagai usia dan jalan nafas sulit jadi lebih mudah .
- ❑ Dengan fitur kamera, Pengajar dengan mudah dapat membimbing peserta didik
- ❑ Fitur teleconference dan webinar memungkinkan untuk konsultasi jarak jauh secara real time dan workshop jarak jauh
- ❑ Fleksibilitas penggunaan monitor (HP,Laptop,LCD) sangat memudahkan dan mengurangi ketergantungan pada monitor bawaan pabrik
- ❑ Harga yang murah memudahkan setiap lini pelayanan memiliki alat ini.

Terimakasih