# Live streaming to the medical dispatcher in case of out-of-hospital cardiac arrest

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Clinical Paper

# Challenges in out-of-hospital cardiac arrest – A study combining closed-circuit television (CCTV) and medical emergency calls ☆

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ARTICLE INFO

ABSTRACT

The aim of this study was to explore challenges in recognition and initial treatment of out-of-hospital cardiac arrest (OHCA) by using closed-circuit television (CCTV) recordings combined with audio recordings from emergency medical calls.

Method: All OHCA captured by CCTV in the Capital Region of Denmark, 15 June 2013–14 June 2014, were included. Using a qualitative approach based on thematic analysis, we focused on the interval from the

# Background

- Identifying OHCA can be difficult – especially abnormal breathing

- Simulation studies have suggested improved DA-CPR with video-call

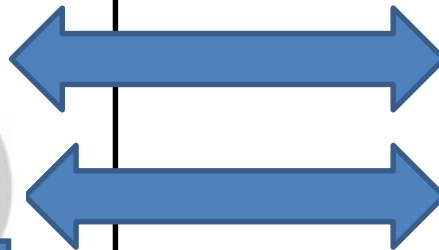- Most mobile phones supports video live streaming

1-1-2 call

The dispatcher sends a text message with a link

**Emergency Medical Service, Copenhagen**

1-1-2call

Video transmission (encrypted)

Callers have to accept a text message request to confirm they are willing to transmit footage.

Data are stored on a local server

# Before video transmission

- Two bystanders or more

- Dispatch ambulance

- Caller has to say out loud that they are sending live video to the medical dispatcher

# Three main studies

1) Can live streaming to emergency medical dispatchers be used to evaluate the unconscious patient with suspected normal breathing?

2) Can live streaming to emergency medical dispatchers enhance the CPR quality?

3) What are the experiences with live streaming during the emergency call both to the medical dispatchers and the callers?

# Method

- **<u>Pilot project</u>**: 4 months

- Participants: 10 emergency medical dispatchers

- Purpose: To evaluate the technical solution, outcome template, the usefulness and the caller's experience with video

# Included emergency calls in pilot project:

| Emergency calls cases | First month | Second month | Third month | Fourth month |
|---|---|---|---|---|
| Non-serve emergency cases | x | x | | |
| Patients reduced consciousness | | x | x | x |
| OHCA | | | x | X |

# Study 1

- Inclusion: Suspected unconscious patient with normal breathing

- Period: 12 months

- Outcome: The medical dispatchers' evaluation of the patient and treatment after video
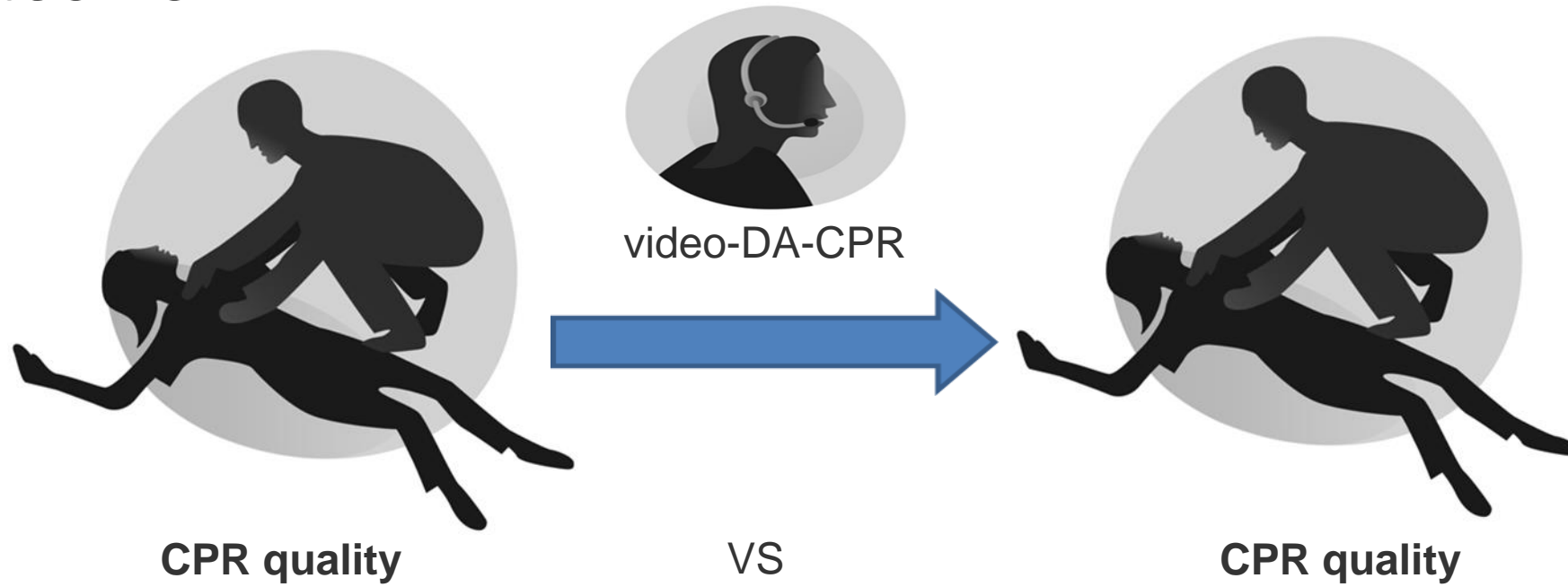
# Study 2

- Inclusion: Suspected OHCA

- Period:12 months

- Participants: All Medical dispatchers!

- CPR has to be started

# Outcome



video-DA-CPR

**CPR quality**              VS              **CPR quality**

# Primary outcomes

- Correct hand-placement before and after video-DA-CPR: (yes/no vs. yes/no)

- Correct compression rate before and after video-DA-CPR: (yes/no vs. yes/no)

- Correct compression depth before and after video-DA-CPR: (yes/no vs. yes/no)

# Comparison and alignment with manikin data vs. visual

| Item | Agreement [%] |
|---|---|
| **Hand position** - Middle of the chest | 93,3 |
| **Rate** - Average rate within guidelines 100-120/min | 80,8 |
| **Depth** - Keep a compression depth as recommended by ILCOR (5-6cm) in at least 50% of compressions | 80,8 |
| **Recoil/lean** - Full rise in at least 50% of all compressions | 65,8 |
| **Rescue breaths** - Visible chest rise in at least 50% of all ventilations OR more than 400ml | 86,7 |

# High CPR quality

- High CPR quality; if correct Hand-placement, correct compression rate and correct depth.

- Low CPR quality; if not

# How many OHCA?

- Power and sample size calculation; High CPR quality 50% ➡ 70%

- 44 (53) video transmissions (McNemars test for sample size calculation (power 80% and Type 1 error rate 0,05% and Type 2 error rate 80%))

- Logistic regression: (adjusted for Gender, Age estimation of bystander (<18, 18-65, >65), Basic life support course (yes, No, unknown))
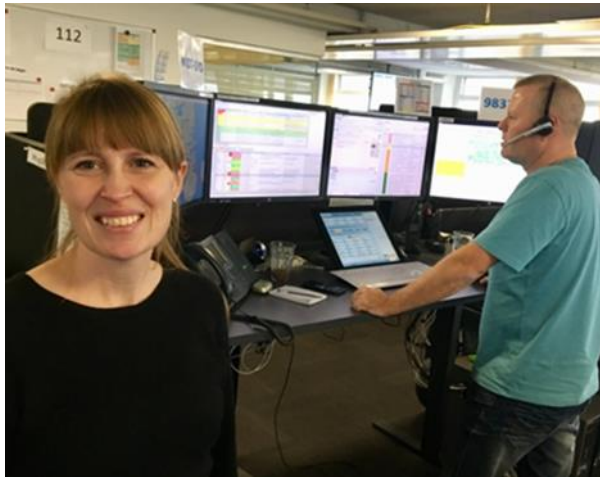
# Secondary outcomes that will be registered during the entire video transmission

- 4) Hands-off-time

- 5) Correct ventilation

- 6) Shift of persons during CPR

- 7) Correct use of AED

# Questions?

# Assessment of CPR quality using video (Copenhagen Tool)

| Layperson - item 8. Hand position | |
|---|---|
| Item definition | Rescuer places the heel of one hand on the middle of the chest and interlocks fingers from both hands |
| Question when rated | Middle of the chest |
| IRR of item | 0,26 = Acceptable (above 0,2), 95 % CI: -0,20 ; 0,68 |

| Layperson - item 9. Rate | |
|---|---|
| Item definition | Rescuer keeps a compression rate of approximately 100-120 compressions per min. throughout the CPR |
| Question when rated | Average rate within guidelines 100-120/min |
| IRR of item | -0,01 = Very low, not acceptable (under 0,2), 95 % CI: -0,41 ; 0,32 |

| Layperson - item 10. Depth | |
|---|---|
| Item definition | Rescuer keeps a compression depth of approximately 5-6 cm |
| Question when rated | Keep a compression depth as recommended by ILCOR (5-6cm) in at least 50% of compressions |
| IRR of item | 0,56 = High (above 0,4), 95 % CI: 0,33 ; 0,78 |