



Copenhagen EMS Use of AI in medical dispatch

EMDC-Copenhagen case

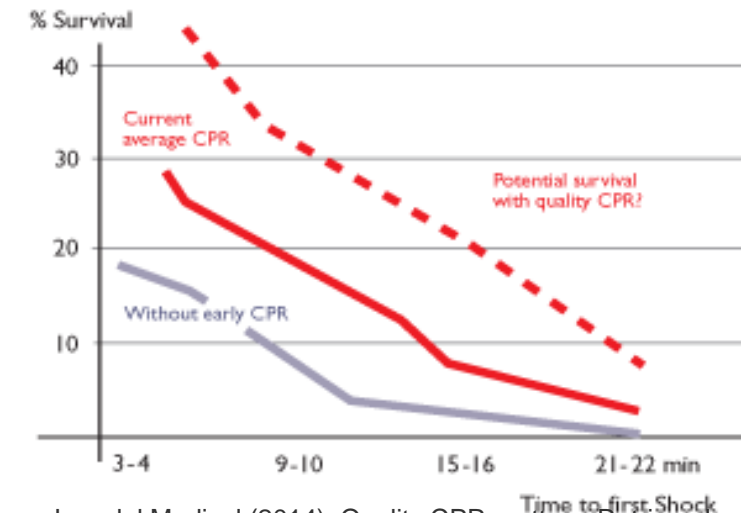
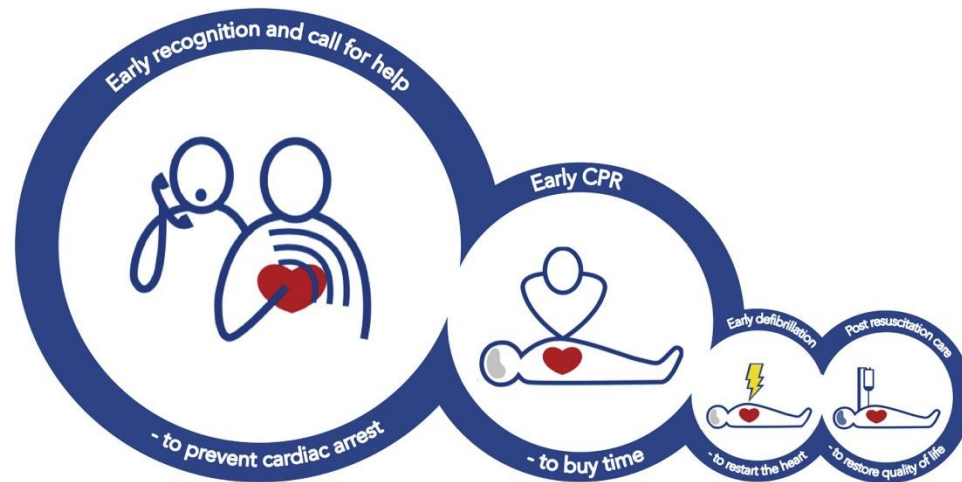


Disclosure

I have no actual or potential conflict of interest in relation to this research project.

- Received an unrestricted research grant from TrygFoundation
- Received centresupport from Laerdal

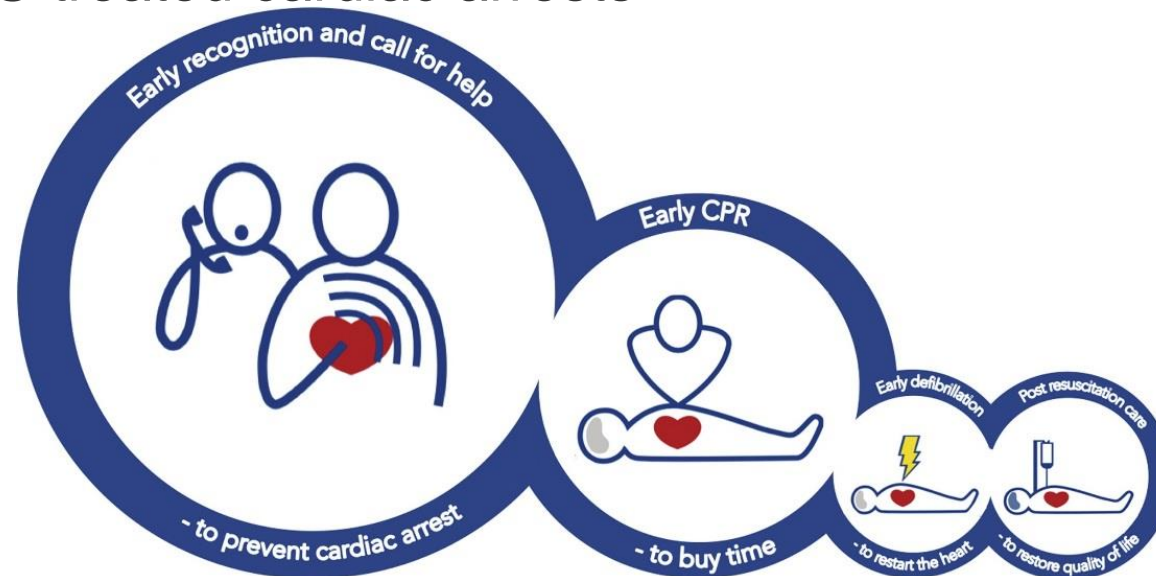
Why is artificial intelligence relevant for Out-of-Hospital Cardiac Arrest?



Laerdal Medical (2014). Quality CPR matters. Retrieved from <http://www.laerdal.com/ca/docid/36691005/Quality-CPR-matters>

Recognising out-of-hospital cardiac arrest is the challenge

- We have trained dispatchers in recognising OHCA
- We use decision support tools
- Still, we recognize just about 75% of all EMS-treated cardiac arrests



Can AI help ? How EMDC-Copenhagen uses AI.

- We set out to investigate if AI can be used as a decision support tool in medical dispatch
- It is a tool for support, not a final bottom line





Available online at www.sciencedirect.com

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation



Clinical paper

Machine learning as a supportive tool to recognize cardiac arrest in emergency calls



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Can AI recognize cardiac arrest from audio. Retrospective study all calls in 2014

- 108,607 incidents with call to emergency number (1-1-2)
- 918 calls regarding cardiac arrest
- 84.1% recognised by AI (95% CI: 81.6-86.4)
- 72.4% (95% CI: 69.4-75.3). Recognised by Dispatch
- 107 previously unrecognised OHCA recognised

Status	Medical dispatch	Machine learning framework
Recognized cardiac arrests	665	772
Unrecognized cardiac arrests	253	146
Cardiac arrest in population	918	918

Blomberg, S. N., Folke, F., Ersbøll, A. K., Christensen, H. C., Torp-Pedersen, C., Sayre, M. R., ... & Lippert, F. K. (2019). Machine learning as a supportive tool to recognize cardiac arrest in emergency calls. *Resuscitation*.

The other side of the coin False positive

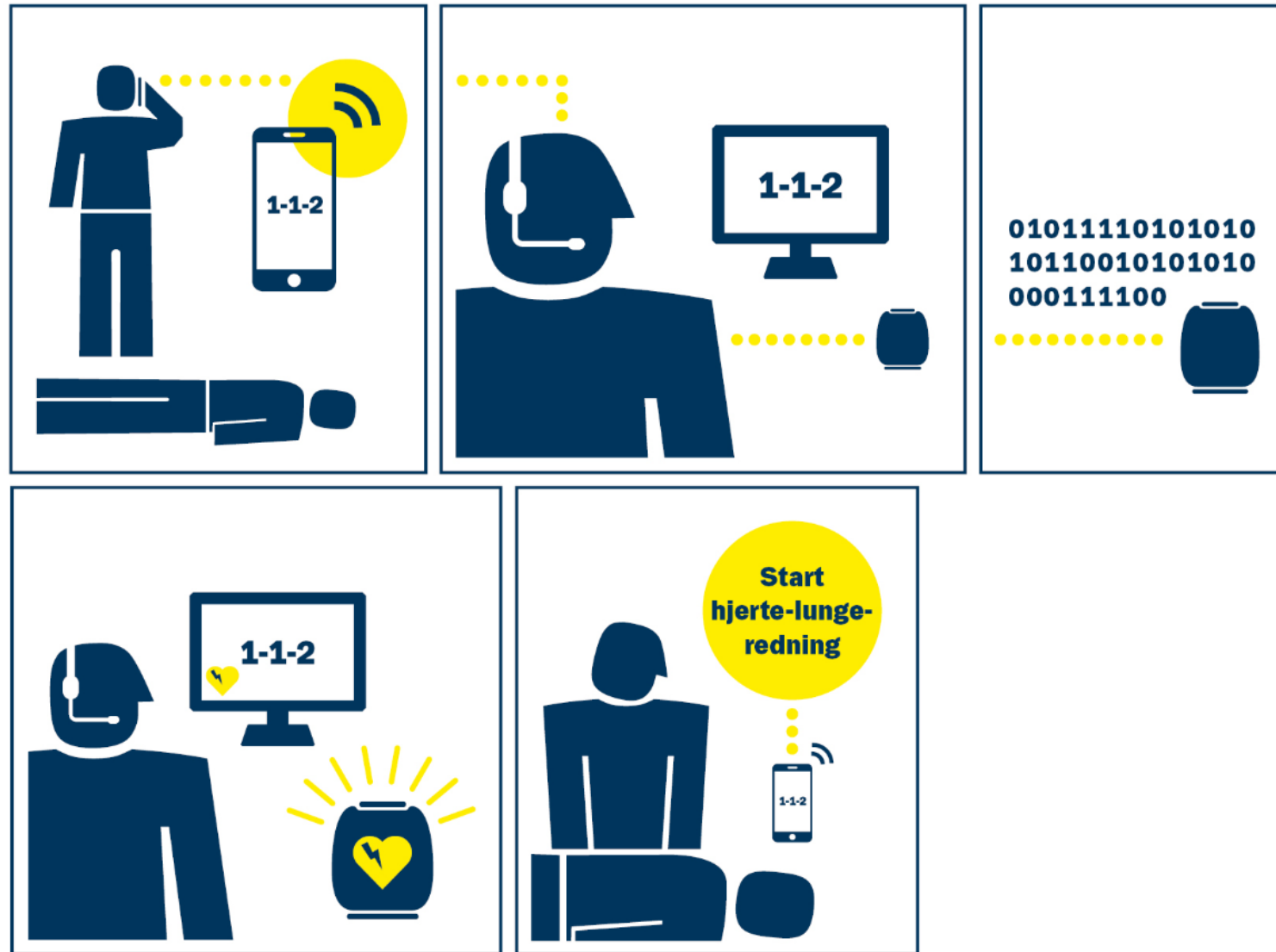
- 108,607 incidents with call to emergency number (1-1-2)
- 918 calls regarding cardiac arrest
- 1,300 false positives by dispatcher
- 2,900 false positive by AI
- 1,600 extra cardiac arrest alerts
- Problem ?
- Consequence ?





Can AI work on live audio in clinical practice

- Prospective randomised trial
- Started september 2018
- 12 months, at least 400 arrests in each group
- Dispatchers in intervention group will receive alert in case of AI recognised cardiac arrest
- Alert: Dispatch High-Priority light and sirens; repeat No-No-Go; Dispatch Citizen responders



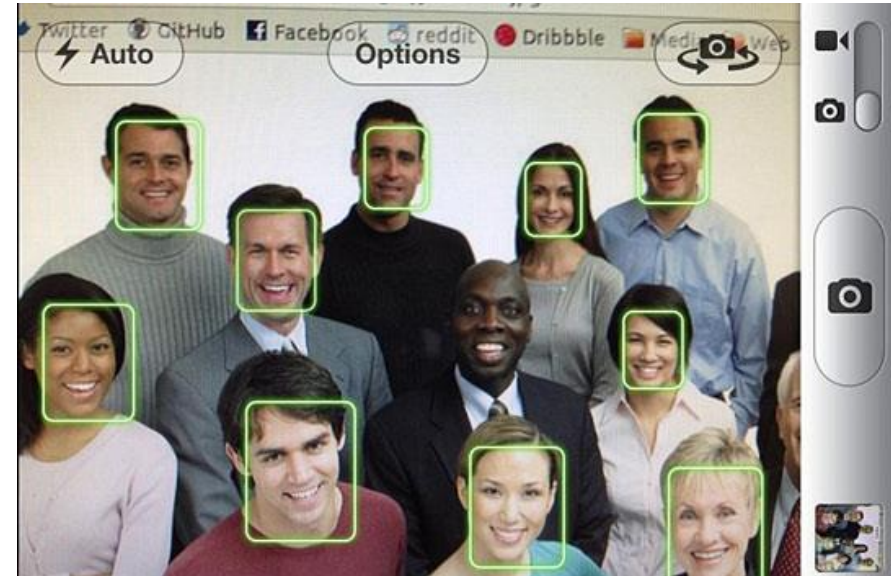


Happening right now



Challenges using AI

- Data ethics
- Overfitting model
- Public opinion on data usage
- Data validation and “time changes”
- Black box vs known impact of single factors





Thank you.

My supervisors

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TrygFonden

Corti



Summary

AI can be trained to recognize Cardiac Arrest

AI can improve recognition of Cardiac Arrest

AI is a decision support tool

A randomized clinical trial is being performed, preliminary results expected autumn 2019

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