App-based ECG – Lufthansa’s approach to introduce mHealth for more safety on board

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App based ECG
mHealth for more safety on board

13.06.2019, IATA COSC - Istanbul
Dr. Sven-Karsten Peters & André Gomola
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Statistics of medical emergencies at commercial airlines

4.1 bil. 
Passengers in 2017

1/14.000 to 1/50.000 
Cardiac emergencies

10%
Increasing number of elderly passengers

Up to 64% with pre-existing conditions

1/50.000 
passengers with chance of medical emergencies

App based ECG - mHealth for more safety on board 
June 2019, IATA COSC Istanbul
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The approach to use telemedicine for more safety on board

History of telemedicine at Lufthansa
2001 - Cooperation with Berlin Charité
2009 - Project revive with new FlyNet
2016 - New opportunities with Cabin Crew device

Systems compared
- iPad app based 12-lead ECG cable with only four electrodes
- Remote controllable telemedical device with seven electrodes, blood pressure cuff and pulse oximeter

Evaluation phase
- Two possible solutions
- Mock-up tests with cabin crews
- Connectivity tests
- Live inflight tests
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Piloting a mobile ECG solution

- Implementation on long haul flights only
- A380 trial phase for 12 months
- Loaded via catering
- Cabin Crew Device (iPad) as central unit
- No changes to medical emergency SOP needed
- Easy to use after short introduction (video)
- Cooperation with MedAire for evaluation of real ECG reading
## Agenda

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First results & learnings

- 25 passengers were examined until April 2019
- About 4 ECGs per passenger were sent to “International SOS” Hotline (MedAire)
- Medical personnel was available on board in most cases
- Major cardiovascular diseases could be excluded in 50% of all cases
- During 10 flights the ECG was used to continuously monitor the heart condition
- About 8 unnecessary diversions have been prevented
- 2 diversions due to immediate emergency with diagnosis of myocardial infarction
First results & learnings

- Second diversion on Dec. 16\textsuperscript{th} 2018
- Flight LH 441 from Miami to Frankfurt / Main
- 51 year old female passenger
- Cardiovascular risk factors: Hypertension, adipositas
- Symptoms: Short term loss of consciousness and chest pain
- First aid by a physician and close downlink of the ECG to the hotline
First results & learnings

- ECG completes diagnosis gap on board
- Excellent quality of ECG results during flight
- Possible prevention of unnecessary diversion
- Medical personnel can make use of ECG with or without internet

Advantages:
- digital documentation
- easy to implement
- requires minimal staff-training
- supports medical diagnosis on board and on the ground