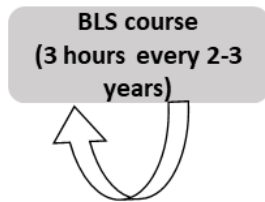# ILCOR 10 Steps to improve IHCA – a Case Study from Denmark

**Background:** In-hospital cardiac arrest can occur anywhere and anytime in a hospital requiring healthcare providers to act in unexpected situations, which challenges cardiopulmonary resuscitation (CPR) quality and teamwork.[1-4] Training ward staff is, therefore, essential for high-quality CPR and improvement of team performance, and thereby survival outcomes after in-hospital cardiac arrest.[5, 6]

The current CPR training strategy in Denmark is based on courses every 2-3 years where clinical staff is taken out of clinical work to attend courses in simulation centers.[7, 8] The courses are hospital-based and guideline-based but not certified by the European Resuscitation Council. However, studies have shown that skills rapidly decay after only 1-6 months,[9-13] and training outside of the clinical setting leads to lacking contextual skills.[14-16] Therefore, the International Liaison Committee on Resuscitation (ILCOR) suggests doing low-dose, high-frequency training as one of the steps to improve survival from in-hospital cardiac arrest.[17]

**CURRENT TRAINING STRATEGY**

BLS course
(3 hours every 2-3 years)

We aim to implement a low-dose, high-frequency CPR training strategy and study barriers and facilitators for implementation as well as the observed effects on CPR skills and patient outcomes.

**Steps Taken:** We are changing all basic life support training to be conducted as brief, in-situ simulations of 20 minutes 3 times per year, 4 unannounced in-situ simulations per year, e-learning once a year, and skill stations 4 times per year (Figure).

The planned in-situ simulations are conducted by 2 instructors each doing simulations with 3-4 participants every 30 minutes during the day, rotating through the units.

We have started a pilot in one department at 2 different hospitals and will then gradually roll out to include all staff in the hospitals.

The included ward staff will switch from their current refresher training regime to the novel training regime using a stepped-wedge approach with one department serving as initial pilot testing.

**NOVEL TRAINING STRATEGY**

BLS course
(3 hours)

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E-learning
(every 6-12 months)

Individual skill training
(2-4 minutes every 3 months)

In-situ simulation
(20-40 minutes every 4 months)

We are using the framework for complex interventions implementation to study the clinical needs, current limitations to training, and implementation of a low-dose, high-frequency CPR training strategy.
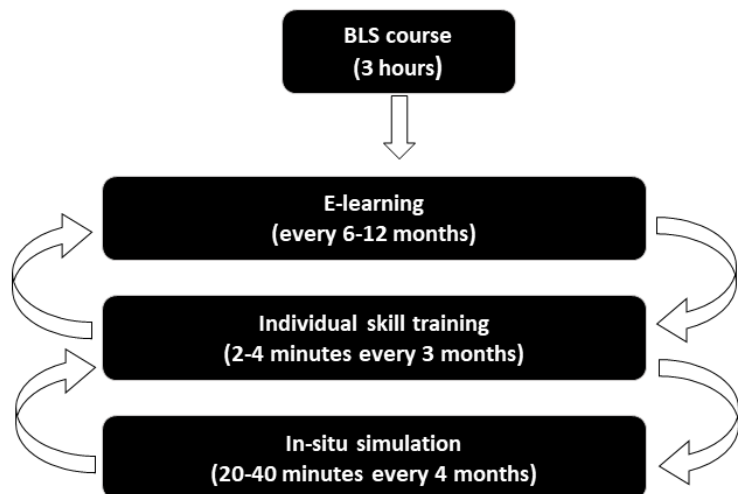
**Challenges:** We aim to include the whole Central Denmark Region. However, some hospitals have sparse resources for teaching in spite of the fact that we found a format where one instructor can run multiple simulations in different departments in one day.

Moreover, we chose to focus on basic life support training as we believe this will be most impactful on survival outcomes and because of logistical challenges in getting cardiac arrest team members together from different departments for simulation training.

**Results:** During the implementation process, we will assess:

        A) the number of training sessions per staff member,

        B) the impact on chest compression skills measured by skill stations,

        C) teamwork competencies during in-situ simulations,

        D) clinical performance and cost-effectiveness.

Furthermore, we will compare departments from the lower quartile with the upper quartile in terms of implementation compliance followed by an assessment of barriers and facilitators for implementation. During qualitative interviews, we will further assess the barriers, facilitators, and benefits of implementing a low-dose, high-frequency training strategy from a leadership perspective and provider perspective.

**Outlook:** We will conduct a full-scale implementation of a low-dose, high-frequency training strategy and investigate both the implementation and effectiveness of a pragmatic implementation in a clinical setting. We hope our experiences and findings can help other hospitals to improve their resuscitation training strategies leading to better outcomes.

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