

# PULSE OXIMETRY SCREENING FOR CRITICAL CONGENITAL HEART DISEASE IN THE NORDIC COUNTRIES – IMPLEMENTATION PROGRESS, UPDATE OF CURRENT PRACTICE AND A PROPOSAL FOR UNIFORM GUIDELINES

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## AIM

Pulse oximetry screening of newborn infants has been shown to increase the early detection rate of critical congenital heart disease and to minimize the risk of circulatory collapse before surgery. In spite of this, few countries yet have a national recommendation to screen. This study provides an update of the implementation of pulse oximetry screening in the Nordic countries and proposes standardized guidelines across the Nordic countries.

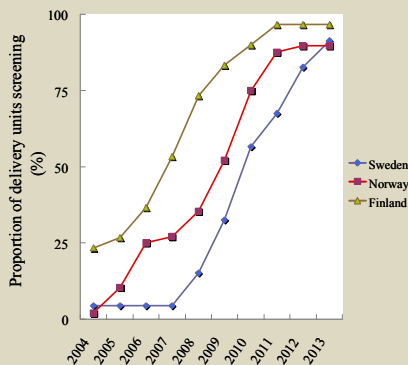
## METHODS

A questionnaire containing 28 items exploring pulse oximetry screening, clinical examination routines and availability of echocardiography was distributed to all delivery units ( $n = 157$ ) in the Nordic countries in June 2013.

## RESULTS

The results describe the situation in September 2013. In Finland pulse oximetry screening had been implemented in 97% of all delivery units, in Sweden in 91% and in Norway in 90% (Fig1). In Denmark 8% of delivery units were screening while no unit was screening in Iceland. Pre- and postductal screening was consistently used in Sweden and in 34% of delivery units in Finland. Postductal screening alone was used in 72% of units in Norway and in 55% in Finland. Screening was performed before 24 hours of age in 76% of the screening units in Sweden, 97% in Finland and 88% in Norway (Table 1). Four Nordic countries lacked national guidelines for pulse oximetry screening, while Norway endorsed universal screening and guidelines in June 2013. As a result of the questionnaire the authors agreed to propose uniform Nordic guidelines using pre- and postductal screening before 24 hours of age (Fig 2).

**Fig 1.** Implementation of pulse oximetry screening in Sweden, Finland and Norway.



**Fig 2.** Proposed uniform Nordic guidelines



**Fig 2.** Screening in Rt hand (left) and one foot (right) with a FDA cleared, motion tolerant pulse oximeter, endorsed by AAP, AHA & ACC:

**Proposed uniform Nordic G guideline**  
within 24 h of life

<95% in Both Rt hand & foot  
OR  
>3% Hand/ foot difference  
Three repeated times  
OR  
1 measurement ≤90%

	Sweden	Norway	Finland	Denmark	Iceland
Number of delivery units	46	48	30	25	8
Units screening by Sept. 2013	42	43	29	2	0
Will start during 2013	4	3	0	0	0
Will start during 2014	0	2	1	2	0
Units screening at <24h	32	42	29	2	-
Units using the Granelli protocol*	42	7	10	0	-
Units screening in the right hand	0	5	1	0	-
Units screening in one foot only	0	31	18	2	-
Proportion of neonates screened**	95%	89%	99%	10%	0

**Table 1.** Pulse oximetry screening routines in the Nordic countries in September 2013.

## CONCLUSION

In Finland, Norway and Sweden the implementation of pulse oximetry screening is currently the highest in the world and coverage will be close to 100% before the end of 2014. Uniform guidelines across the Nordic countries will promote future collaboration and enable accurate comparisons.