**Variations Modelling of Newborn Life Support Procedure using Coloured Petri Nets**
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**A. Introduction**

Newborn Life Support (NLS) is an action necessary to initiate and support breathing activity of a newborn. It is intended to recover health condition of the baby. There is approximately 10% of newborns who need this procedure and 1% even needs some advanced actions [1].

NLS procedure can be considered as a high-intensive activity which demands an accurate action and concentration in a relatively short time window to save the life of a baby. A good team-work with a well-prepared environment is necessary to assure its effectiveness. Errors, deviations, delay, or ineffective treatment may cause impairment or even death of the baby.

- A study is necessary to look into all possible causes of variations of the procedure in order to optimize its performance.
- Coloured Petri Nets (CPN) is used in this research. Petri Nets is considered as a graphical modelling method that is able to accurately model a real system [2]. A simulation model is also considered to observe the dynamic aspects of the procedure.

**B. Objectives**

1. Modelling the variations of the NLS procedure and their effects
2. Experimenting with some possible variations of the NLS procedure to understand the behaviour of the protocol

**C. Methodology**

The CPN model of the NLS procedure is developed based on the guideline of the NLS procedure published in 2021 by.....

The simplified version of this procedure can be shown in Figure 2.

**D. Results & Conclusions**

An excerpt of the CPN model built for the NLS procedure can be shown in Figure 3. The whole CPN model consists of 50 transitions, 43 places, 37 functions, 35 individual colours, 1 composite colour.

A higher maximum number of trials of standard ventilation procedure may prevent the need to perform a full resuscitation. On the contrary, the number of adjusted inflation trials as well as the one for advanced ventilation must be kept low.

**E. Future Research**

Future agenda on this research is to consider some soft aspects of variations regarding clinical teamwork such as leadership and social interactions which are essential for the NLS performance.

**F. References**

