



South West London
Academic, Health and Social Care
System

Case Studies- Series 2

Novel Approach for neonatal Cannulation

Neonatal practice has long used transillumination to locate hard to find veins when cannulating newborns. However the 'cold light' devices currently in use are prone to bacterial contamination and often prohibitively expensive for health services, both in the UK and in developing countries. SWLS funded a project to assess if the effectiveness of these £300 devices could be equalled or beaten by a simple red LED bike light, costing just £1.

Improvising Effective Alternatives

"Back in 2013 I spotted one of our trainees at the neonatal unit using his red bike light to cannulate a baby when the hospital's cold lights weren't available. It was clearly effective so I suggested we needed to sit down and look at it properly."

Dr John Chang, R&D Director, Croydon Health Services NHS Trust

After discussing the potential benefits with SWLS's Director, Kathy Tyler, Dr Chang applied for a Small Grant to fund further investigation of this alternative approach. The project set out to assess the idea that simple LED bike lights were not only just as effective as current devices, they were also far better value for money, more sterile, more portable and accessible, and thus offered an achievable solution on a wider global-scale.

"Part of the aim is this is not just for the NHS, but also for low-resource settings such as Africa; where a lot of our compassionate trainees have done stints and have seen the



Africa; where a lot of our compassionate trainees have done stints and have seen the need for this low-cost option first-hand." **Dr John Chang**

Scientifically Assessing a New Approach

The SWLS grant afforded Dr Chang and his team the crucial time required for research, and funds to purchase bike lights. Their study involved asking doctors to assess the visibility of veins in photographs of neonates' hands and feet taken under three lighting conditions; traditional cold light, red LED light, and no transillumination at all (control group).

125 paediatric doctors took part in the survey. The three approaches were rated as rendering veins 'moderately to easily visible' in the following ways:

- 43.1% No transillumination (control group)

'Making best practice accepted practice'

- 87.7% Traditional cold light
- 94.7% Red LED bike light

The results clearly showed that the red LED light was at least as effective as the cold light source. If this new method was to be approved and implemented the possible benefits include:

- **Patients and parents:** A reduced number of failed and stressful cannulation attempts
- **Staff:** Swift, successful cannulation saves time and reduces frustration
- **Health Service:** With approximately 200 neonatal units in the UK the savings could be significant.

“Additionally we know that using cold light increases the rate of infections transmission and use of simple red LED lights could reduce this. But because instances of cross-infection contamination are quite low a proper study would require thousands of babies and is not currently feasible.” **Dr John Chang**

Findings and the Future

The evidence so far shows a compelling case for considering red LED bicycle lights as an alternative method of transillumination in neonates. Anecdotal evidence is also good:

“We know that people who have come through training in the unit have found it useful because they keep taking our bike lights with them! So it may be a case of awareness through osmosis. The lights go to other units, where more people see how effective they are. Several trainees have taken them to the

Gambia and sparked some interest.” **Dr John Chang**

However since the goal is regulatory body approval for use in a general setting, rather than ad hoc usage, the challenge is getting those converts to sit down and document their experience as statistical proof.

Dr Chang has recently been granted a two year extension by the ethics committee to continue the study and hopes to complete in 2016. The next step is to run a new cohort of trainees through the project to build the evidence base and get to a stage of clinical completion where they can assess actually cannulating neonates using the LED lights with no actual harm.

Support from SWLS

In the meantime Dr Chang is keen to start disseminating the findings so far. Trainees are currently writing articles to publish findings in medical journals and the study recently won the research category at Croydon Health Service’s Annual Research & Development day; supported by SWLS.

Small Grants, Lasting Impact

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