J Pediatr. 2014 Oct;165(4):666-71.e2. doi: 10.1016/j.jpeds.2014.05.028. Epub 2014 Jun 25.

Impact of study oximeter masking algorithm on titration of oxygen therapy in the canadian oxygen trial.

Schmidt B(1), Roberts RS(2), Whyte RK(3), Asztalos EV(4), Poets C(5), Rabi Y(6), Solimano A(7), Nelson H(2); Canadian Oxygen Trial Group.

Collaborators: Shah P, Brown L, Wenger L, Frye S, Imbesi F, Kelly E, D'Ilario J, Roy M, Schmidt B, Dix J, Adams B, Cairnie J, Gillie P, Asztalos EV, Hyndman M, Lacy M, Hohn D, Kruk LC, Abbasi S, Mancini T, Sivieri E, Finnegan K, Bairam A, Bélanger S, Deschenes M, Fraser A, Harrold J, Frank J, Barden J, Whyte R, Vincer M, Stone S, Rabi Y, Sauve R, Cyr D, Christianson H, Anseeuw-Deeks D, Creighton D, Solimano A, Colby L, Butt A, Synnes A, Peterson M, Schmidt B, Chaudhary A, Hurt H, Foy D, Ziolkowski K, Gerdes M, Bernbaum J, Peliowski A, Kumar M, Hendson L, Athaide M, Tomlinson J, Poets CF, Bassler D, Armbruster J, Vain N, Garcia C, Di-Gruccio V, Tamanaha F, Jacobi N, Garcia S, Vivas N, Osio C, Sridhar S, Parekh A, McGovern R, Arnon S, Meyer M, Poller R, Ali N, Khairy M, Paquet I, Perepolkin L, Grier P, Wali S, Seshia M, Moddemann D, Minski J, Cook V, Kwiatkowski K, Penner KA, Williams D, Givelichian L, Sankaran K, Thiel C, Bader D, Sandler B, Chiu A, Moddemann D, Everatt D, Granke N, Golan A, Goldstein E, Dadoun S, Vikevainen R, Kallankari H, Kaukola T, Hallman M, Barrington K, Lavoie J, Schmidt B, Asztalos EV, Poets CF, Rabi Y, Roberts RS, Solimano A, Whyte RK, Moddemann D, Penner KA, Fraser W, Davis D, Wells G, D'Ilario J, Roberts RS, Costantini L, D'Ilario J, Yacura W, Gent B, Nelson H.

Author information:
(1)Division of Neonatology, Children's Hospital of Philadelphia and University of Pennsylvania, Philadelphia, PA; Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Canada. Electronic address: barbara.schmidt@uphs.upenn.edu. (2)Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Canada. (3)Department of Pediatrics, Dalhousie University, Halifax, Canada. (4)Department of Paediatrics, University of Toronto, Toronto, Canada. (5)Department of Neonatology, Eberhard Karls University, Tuebingen, Germany. (6)Department of Pediatrics, University of Calgary, Calgary, Canada. (7)Department of Pediatrics, University of British Columbia, Vancouver, Canada.

Comment in
J Pediatr. 2014 Oct;165(4):657-8.

OBJECTIVE: To compare oxygen saturations as displayed to caregivers on offset pulse oximeters in the 2 groups of the Canadian Oxygen Trial.

STUDY DESIGN: In 5 double-blind randomized trials of oxygen saturation targeting, displayed saturations between 88% and 92% were offset by 3% above or below the true values but returned to true values below 84% and above 96%. During the transition, displayed values remained static at 96% in the lower and at 84% in the higher target group during a 3% change in true saturations. In contrast, displayed values changed rapidly from 88% to 84% in the lower and from 92% to 96% in the higher target group during a 1% change in true saturations. We plotted the distributions of median displayed saturations on days with >12 hours of supplemental oxygen in 1075 Canadian Oxygen Trial participants to reconstruct what caregivers observed at the bedside.

RESULTS: The oximeter masking algorithm was associated with an increase in both stability and instability of displayed saturations that occurred during the transition between offset and true displayed values at opposite ends of the 2 target ranges. Caregivers maintained saturations at lower displayed values in the higher than in the lower target group. This differential management reduced the separation between the median true saturations in the 2 groups by approximately 3.5%.

CONCLUSIONS: The design of the oximeter masking algorithm may have contributed to the smaller-than-expected separation between true saturations in the 2 study groups of recent saturation targeting trials in extremely preterm infants.