“Turn It Off!”: Diabetes Device Alarm Fatigue Considerations for the Present and the Future

Joseph P. Shivers, B.A.,1 Linda Mackowiak, M.S., R.N., C.C.R.A., C.D.E.,2 Henry Anhalt, D.O.,3 and Howard Zisser, M.D.1,4

Abstract

Safe and widespread use of diabetes technology is constrained by alarm fatigue: when someone receives so many alarms that he or she becomes less likely to respond appropriately. Alarm fatigue and related usability issues deserve consideration at every stage of alarm system design, especially as new technologies expand the potential number and complexity of alarms. The guiding principle should be patient wellbeing, while taking into consideration the regulatory and liability issues that sometimes contribute to building excessive alarms. With examples from diabetes devices, we illustrate two complementary frameworks for alarm design: a “patient safety first” perspective and a focus on human factors. We also describe opportunities and challenges that will come with new technologies such as remote monitoring, adaptive alarms, and ever-closer integration of glucose sensing with insulin delivery.


Author Affiliations: 1Sansum Diabetes Research Institute, Santa Barbara, California; 2Linda Mackowiak LLC, Cazenovia, New York; 3Medical Affairs, Animas Corporation, West Chester, Pennsylvania; and 4Department of Chemical Engineering, University of California, Santa Barbara, Santa Barbara, California

Abbreviation: (CGM) continuous glucose monitoring

Keywords: alarm fatigue, continuous glucose monitoring, insulin pumps, nocturnal hypoglycemia

Corresponding Author: Howard Zisser, M.D., Sansum Diabetes Research Institute, 2219 Bath St., Santa Barbara, CA 93105; email address hzisser@sansum.org