

RDOC: An Internet Intervention to Improve Rural Diabetes Care



A.H. Salanitro, MD, MS^{1,2}, J.J. Allison, MD, MSc¹, P.P. Foster, MD, MPH³, C.K. Alexander, MD³, R.M. Shewchuk, PhD¹, T.K. Houston, MD¹, M.M. Safford, MD^{1,2}, C.A. Estrada, MD, MSc^{1,2}
 Univ. of Alabama at Birmingham¹, Birmingham VAMC², University of Alabama at Tuscaloosa³



Background

- Over 17 million Americans have type 2 diabetes, contributing to significant morbidity and mortality.¹
- Wide gap exists between clinical evidence and current practice, especially burdensome for patients in poor rural areas in Southern U.S.²
- Physician access to information narrowing due to Internet, yet multiple barriers exist in changing behaviors in order to improve diabetes care.³

Purpose

Rural Diabetes Online Care (RDOC) is an Internet-based intervention for rural primary care physicians, focusing on improving care for adult patients with diabetes. Funding provided by grant NIDDK R18 DK 650001.

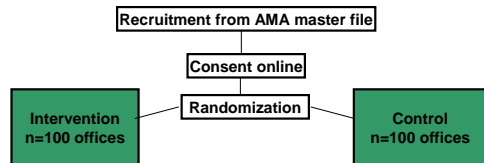
Objectives

- Evaluate the effectiveness of an educational, multimodal intervention for rural primary care physicians, delivered via the Internet, on diabetes outcomes in a randomized controlled trial.
- Study the intervention's effects on diabetic patients' ABC's:
 - A for hemoglobin A1c
 - B for blood pressure
 - C for cholesterol/lipids

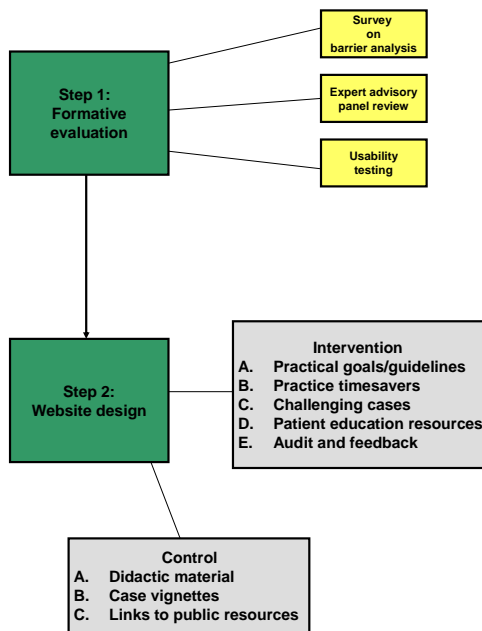
Study Design (1)

- Study length: 4 years
 - 18 month Internet intervention
 - Intervention group
 - Case-based education
 - Performance feedback
 - Benchmarks
 - Control group
 - Text-based materials
 - Non-interactive website
- Subjects
 - Practicing rural primary care physicians and their office staff in the southeastern U.S.
 - Rural location defined by Office of Management and Budget: all population and territory not within any urban area.

Study Design (2)



Intervention Design



Recruitment Phases

- Phase 1: counties close to Birmingham, Alabama, plus Mississippi, Florida, Georgia, Tennessee, Arkansas, and Kentucky.
- Phase 2: other rural counties in Alabama, Mississippi, Georgia, and Tennessee.
- Phase 3: North and South Carolina, Missouri, and West Virginia, plus other counties from Arkansas, Florida, and Kentucky.

Measurements

- Online feedback from questions answered for cases, with comparison to responses from other physicians in intervention group
- Chart abstraction
 - For personal performance feedback (15 charts/physician)
 - For examining change in performance for intervention and control physicians as evaluation of entire study

Analyses

- Main analysis is conducted at the individual physician level.
- Multivariable techniques to adjust for repeated measures, clustering of patients within physicians' practices, and multiple providers within a single office
- Cluster randomization: In group randomized designs, within-group similarities decrease the effective sample size compared to a situation using individual randomization.⁴ To compensate for this clustering, the sample size derived from standard calculations is multiplied by an inflation factor (IF) representing the amount that the unadjusted variance estimate needs to be inflated to obtain the correct variance.
 - 2 sided t-test with $\alpha = 0.05$ and 80 % power
 - $IF = [1 + (m - 1) \rho]$, where m is the number of subjects per cluster, and ρ is the intraclass correlation coefficient. Typical values of intraclass correlation range from 0.001 to 0.4. To be conservative, we chose $\rho = 0.1$ and allowed for 20% attrition.
 - (unadjusted sample size) * (IF) = adjusted sample size

Limitations

- Voluntary participation
- Unequal representation among rural physicians

Retention

- Frequent email, reminding participants enrolled in intervention website
- Contact with offices in intervention group
- New postings to website with e-mail notification

Outcomes

- Primary: differential pre-post intervention change in performance measures between study arms, with regards to adherence to guidelines defined by Diabetes Quality Improvement Program (DQIP)
- Secondary: Eye screening, foot exam, monitoring of kidney disease, dietary and exercise advice, self-monitoring, aspirin use counseling, smoking cessation advice, vaccinations

Cutting-edge Aspects

- Participants receive immediate, interactive responses to cases
- Content is dynamic, with participant choices affecting content and mode of presentation
- Immediate CME credit upon completion of modules
- Lead physician provided individual feedback, along with study-wide data

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