A Research Journey: Moving to Implementation and Improving Outcomes for Veterans

Hayden B. Bosworth, PhD
Acknowledgements

• Our veterans and the Veterans Health Administration
• VA HSR&D for funding this work
  – Research Career Scientist Award VA 3/1/08-2/28/13
  – Senior Research Career Scientist Award 3/1/13-2/28/20
Poor Lifestyle & Chronic Disease Epidemic

Medication non-adherence
- Non-Adherence is an annual $290 billion problem
- 50% of do not take their medication as instructed

Obesity
- >160 million U.S. are overweight, pre-obese, or obese.
- 70% veterans overweight/obese
- Obesity increases the risk of hypertension, type 2 diabetes, and lipid concentrations.

Alcohol Abuse
- >14 million suffer from alcohol abuse or alcoholism.
- Heavy drinking can cause heart, liver and pancreas problems, as well as increase the risk of developing certain cancers.

Smoking
- 47 million U.S. are smokers.
- Smoking is responsible for 80% of COPD (emphysema and chronic bronchitis) deaths.
Chronic Disease Management

• Chronic illness contributes to the majority of U.S. health expenditures (> $1.25 trillion a year)
  – the life expectancy in the U.S. is actually declining
• Among VA patients, 72% have one or more chronic health conditions
  – compared with 40–50% of other U.S. adults
Chronic Disease Management

• Improving chronic disease is important as VA strives to meet the demands of the aging Veteran cohort and care for younger Veterans.
Importance of Chronic Disease Management

- Off-load primary care visits
- Create new models of care – increase access
- Support for performance incentive goals
- Improves quality measures
Key tools to personalize and tailor intervention programs

- Tailoring ≠ targeted communication strategies
  - Targeted communications are developed to appeal to subgroups, based on characteristics such as race or gender
  - Tailored communications involves collected data so that unique messages can be created or “tailored” for that individual
  - Can tailor on multiple variables such as level of motivation, cultural preferences, and past behaviors
Patient Interventions & Content

- Over 80 tested diseases states & conditions as well as 33 behavioral, educational and assessment topics.

<table>
<thead>
<tr>
<th>Disease State &amp; Condition</th>
<th>Assessment, Behavior &amp; Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>Hypertension</td>
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<tr>
<td>Apnea</td>
<td>Hyperthermia</td>
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<tr>
<td>Asthma (Adult)</td>
<td>Hypoglycemia</td>
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<tr>
<td>Asthma (Pediatric)</td>
<td>Insomnia</td>
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<tr>
<td>Breast Cancer</td>
<td>Irritable Bowel Syndrome (IBS)</td>
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<tr>
<td>Cholesterol</td>
<td>Menopause</td>
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<tr>
<td>Chronic Kidney Disease (CKD)</td>
<td>Mental Well-being</td>
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<tr>
<td>COPD</td>
<td>Migraines</td>
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<tr>
<td>CVD (General)</td>
<td>Multiple Sclerosis (MS)</td>
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<td>CVD (Women)</td>
<td>Osteoporosis</td>
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<td>Dementia</td>
<td>Oxygen Therapy/Respiratory</td>
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<td>Depression</td>
<td>Pain Management</td>
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<tr>
<td>Diabetes</td>
<td>PTSD</td>
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<td>Glaucoma/Vision</td>
<td>Sickle Cell</td>
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<tr>
<td>Heart Failure</td>
<td>Stress</td>
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<td>Hepatitis B &amp; C</td>
<td>Stroke</td>
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<td>HIV</td>
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<td>Aging and Falls</td>
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<td>Alcohol Use/Misuse</td>
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<td>Behavioral Economics</td>
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<td>Breast Cancer (Screening)</td>
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<td>Breast Cancer (Screening)</td>
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<td>Caregivers</td>
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<td>Complementary Health</td>
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<td>Diet</td>
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<td>Drug/Substance Abuse</td>
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<td>Environmental Triggers</td>
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<td>Exercise</td>
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<td>Genetic Testing</td>
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<td>Health Wellness Assessment</td>
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<td>Hydroxurea Use (HU)</td>
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<td></td>
<td>Medication Adherence</td>
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<td>Memory</td>
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<td>Pain Assessment</td>
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<td>Patient-Initiated Interaction</td>
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<td>Post Hospitalization Transition</td>
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<td>Risk Communication</td>
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<td>Risky Behaviors</td>
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<td>Safety</td>
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<td>Self monitoring</td>
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<td>Sickle Cell Knowledge</td>
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<td>Side Effects</td>
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<td>Smoking &amp; Tobacco Cessation</td>
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<td></td>
<td>Social Support</td>
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<td></td>
<td>Weight loss</td>
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<td>Wellness</td>
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</table>

- Mental Well-being
### Recent Randomized Trials of Chronic Disease Management

<table>
<thead>
<tr>
<th>Study Name</th>
<th>(sample size)</th>
<th>Study Sample</th>
<th>Retention Rate</th>
<th>% Minority</th>
<th>Literacy Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veterans Study to Improve Control of Hypertension – V-STITCH</td>
<td>(n = 588)</td>
<td>• Hypertensive veterans</td>
<td>84% (24 months)</td>
<td>40%</td>
<td>&lt;9th Grade</td>
</tr>
<tr>
<td>Take Control of Your Blood Pressure Study – TCYB</td>
<td>(n = 636)</td>
<td>• Hypertensive community patients</td>
<td>75% (24 months)</td>
<td>50%</td>
<td>&lt;9th Grade</td>
</tr>
<tr>
<td>Hypertension Intervention Nurse Telemedicine Study – HINTS</td>
<td>(n = 593)</td>
<td>• Hypertensive veterans with inadequate BP control</td>
<td>85% (18 months)</td>
<td>49%</td>
<td>&lt;9th Grade</td>
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<tr>
<td>Hypertension Telemedicine Nurse Implementation Project for Veterans</td>
<td>HTN – IMPROVE (target n = 1,500)</td>
<td>• Veterans at 3 sites with hypertension</td>
<td>84%</td>
<td>n/a</td>
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<tr>
<td>CITIES (target n = 500)</td>
<td></td>
<td>• Veterans with &gt;20% CVD risk</td>
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<tr>
<td>Telephone-Based Self-Management for OsteoArthritis in Veterans</td>
<td>SeMOA (n = 515)</td>
<td>• Veterans with physician diagnosed, symptomatic knee or hip osteoarthritis</td>
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<tr>
<td>Couples Partnering for Lipid Enhancement Strategies</td>
<td>CouPLES (n = 255)</td>
<td>• Veterans with elevated LDL-C and their spouses</td>
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</table>

<table>
<thead>
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<th>Study Sample</th>
<th></th>
<th>% Minority</th>
<th>Literacy Level</th>
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</thead>
<tbody>
<tr>
<td>HTN-IMPROVE is a 3 part study</td>
<td></td>
<td>53%</td>
<td>&lt;9th Grade</td>
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<tr>
<td>• Veterans at 3 sites with hypertension</td>
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</table>

- More than 3500 individuals enrolled
Veterans Study to Improve the Control of Hypertension

The V-STITCH Study

VA Health Services Research Investigator Initiated Award, 2001-06
The V-STITCH Study

- A randomized controlled trial testing a nurse administered, telephone interventions designed to improve BP control
- Durham VAMC General Medicine Clinics
- Patients with hypertension on medications
- 24-month intervention and follow-up
Patient Characteristics (N=588)

- Male: 98%
- Mean age: 63 years (21-87)
- White: 57%
- African American: 40%
- High school or less: 51%
- Inadequate income: 23%
Nurse Behavioral Intervention vs. None
Secondary Analysis

BP Control

Time in Months

RN Behavioral
N=294
P=0.03
No RN
N=294
Compliance with Nurse Telephone Intervention

• Patients completing all 12 scheduled study calls: 85%

• Average length of call: 3 minutes (SD 2.5 min)
## Average Behavioral Intervention Costs Per Patient over 24 months

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Patients Overseen by Nurse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Patients</td>
<td>1120</td>
</tr>
<tr>
<td></td>
<td>840</td>
</tr>
<tr>
<td></td>
<td>560</td>
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<tr>
<td>Direct Costs/per patient</td>
<td>$70 ($61-$81)</td>
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<td></td>
<td>$94 ($82-$109)</td>
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<tr>
<td></td>
<td>$141 ($123-$163)</td>
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</table>
Summary

• Brief telephone intervention improved BP control by 21% at 24 months
  – 12.6% improvement compared to the non-behavioral group

• No increase in clinic utilization

• Cost effective
Hypertension Intervention Telemedicine Study (HINTS)

Department of Veterans Affairs, Grant IIR 04-426 (2005-2008)

Career Scientist Award 08-027 (2008-2013)
Hypertension Intervention Nurse Telemedicine Study (HINTS)

**Design**

- An 18-month randomized controlled trial
- 593 veterans enrolled; 49% African Americans
- Focus on patient self-management
  - The nurse administered patient intervention
  - Home BP monitoring
  - Medication management by MDs
Baseline Characteristics (N=593)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (range)</td>
<td>64 (30-89)</td>
</tr>
<tr>
<td>Male</td>
<td>92%</td>
</tr>
<tr>
<td>White</td>
<td>49%</td>
</tr>
<tr>
<td>African American</td>
<td>48%</td>
</tr>
<tr>
<td>Not high school graduate</td>
<td>13%</td>
</tr>
<tr>
<td>Low literacy level (&lt; 9&lt;sup&gt;th&lt;/sup&gt; grade)</td>
<td>38%</td>
</tr>
<tr>
<td>Inadequate income</td>
<td>18%</td>
</tr>
</tbody>
</table>
Summary Results

• Among veterans with poor baseline BP control
  – Systolic BP decreased in the combined group by 14.8 mm Hg (95% CI: -21.8, -7.8) at 12 months
  – Systolic BP decreased 8.0 mm Hg (95% CI: -15.5, -0.5) at 18 months.
Estimated SBP with 95% Confidence Regions among the Subgroup with Inadequate BP Control at Baseline (n=243)
### Patient Perspective

<table>
<thead>
<tr>
<th>59</th>
<th>Male</th>
<th>White</th>
<th>Non-DM</th>
<th>Baseline</th>
<th>Final</th>
<th>Chg in BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>Female</td>
<td>Black</td>
<td>Non-Dm</td>
<td>Baseline</td>
<td>Final</td>
<td>Chg in BP</td>
</tr>
<tr>
<td>136/101</td>
<td>116/85</td>
<td>↓ 20/16</td>
<td>140/104</td>
<td>117/79</td>
<td>↓ 23/25</td>
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</tbody>
</table>

**Do you think you BP changed:**
- Yes it has changed, I was having BP readings in the >200/100 sometimes > at the hospital before, now they are much lower around 120/90s.

**What things were particularly helpful about the study?**
- That they seemed truly concerned and that made me want to do better.
- More involved in my own care, felt I was part of the process.

**Do you think your health is improved:**
- Study made me more aware of BPs, medications (what they do & consequences of not taking them).
- Of all the topics discussed, what was most helpful.
- Basically about BP, how to monitor and keep an eye on it. The emphasis on eating properly, losing weight, exercising and watching cholesterol to prevent MI, or Stroke.
How to translate trials into implementation?

• Less than 3 site studies
  – Often single site
• Less than 650 patients
• Intermediate outcomes
  – Physiologic (BP control, BP, A1C)
  – Patient reported (HRQOL, Satisfaction, Adherence)
• Underpowered for cost, utilization, and sometimes even primary outcome!
Hypertension Telemedicine Nurse Implementation Project for Veterans

HTN IMPROVE

Funded by VA HSR&D
Summary of HTN-IMPROVE

Methods
- 3 sites implementing the behavioral telephone program among veterans with poor BP control
- 9 control sites (collecting secondary data only)

• Phase I
  - Evaluating barriers and facilitators for implementing the behavioral program at each of the 3 intervention sites.

• Phase II
  - Examining the impact of the program by comparing 12-month pre/post changes in BP control for veterans who receive the program compared to individuals from the 9 control sites.

• Phase III
  - Examine the implementation costs of disseminating the telephone based behavioral program.
The NC Medicaid Study
NC Medicaid Study

- 558 Medicaid patients
- Self management program focused on improving lifestyle and medication adherence
- Improvement of medication possession from:
  - 55% 12 months prior to program enrollment to 77% 12 months post initiation of the program
Challenges

- Scalability
- ROI/cost
- IT
- Competing needs
- Sustainability
- Evaluation
  - Identifying partners
  - Integrating into regular work of clinic
  - Measuring success
Where is the future?

• Chronic disease growing in prevalence
• Self management programs require intersection of behavior/social contextual environment
• Need for increasing sophistication of analyses and methodologies
• Ability to work in an inter/multidisciplinary environment
• Ensuring we provide our stakeholders what they need
• Investing in our future
Susanne Danus
Felicia McCant
Celine Koropchak
Pam Gentry
Cindy Rose

Debbie Makhanova
Julie Johnson
Teresa Howard
Sarah Gonzales
Leah Zullig
Josh Pathman

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Nancy Pierce
Dana Tucker
Beth Armstrong
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Cribb, Scott
Crowley, Matt
Danus, Susanne
Datta, Santanu
Dennis, Michelle
Dokter, Bradley
Edelman, David
Fisher, Deborah
Ganguly, Doel
Gentry, Pam
Gierisch, Jennifer
Goldstein, Karen
Gonzales, Sarah
Grambow, Steve
Grubber, Janet
Hall, Rasheeda
Harris, Amy
Hastings, Susan (Nicki)
Howard, Teresa
Jackson, George
Jeffreys, Amy
Johnson, Julie
Johnson, Marcus
Juntilla, Karen
Kaufman, Amy
King, Heather
Koropchak, Celine
Lindquist, Jennifer Hoff
Lunceford, Cynthia
Maciejewski, Matthew
Makhanova, Debbie
Marbrey, Laurie
McCant, Felicia
McDuffie, Jennifer
McVay, Megan
Melnyk, Stephanie (Dee)
Monger, Mike
Morey, Miriam
Muir, Kelly
Neary, Alice
Oddone, Eugene
Okorodudu, Daniel
Olsen, Maren
Pathman, Joshua
Pearson, Megan
Pierce, Nancy
Porter, Kim
Powell, Lesa
Provenzale, Dawn
Rose, Cynthia (Cindy)
Sanders, Linda
Shaw, Ryan
Simel, David
Sperber, Nina
Stanwyck, Catherine
Stechuchak, Karen
Steinhauser, Karen
Steward, Nancy
Strauss, Jennifer
Taylor, Jennifer
Tucker, Dana
Tulsky, James
Van Houtven, Courtney
Van Scoyoc, Lynn
Voils, Corrine
Walker, Tessa
Wang, Virginia
Weinberger, Morris
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Eric Cheng  Pauline Sieverding  Ranak Trivedi
Susan Hedayati  Peter Kaboli  Chris Bryson
John Fortney  Bonnie Wakefield  Sara Krein
Donna Washington  Becky Yano  Jeff Whittle
David Atkins  Leonard Egede
Summary

- Intervention tested in >10 separate trials with >6,000 patients – more ongoing
- Balance of targeting/tailoring, clinical expertise, cost, and dose
- Moving into the realm of implementation – Version of the programs are being implemented in NC among 1.5 million Medicaid recipients.

Contact: Hayden Bosworth, PhD
Senior Career Scientist
Durham VAMC
Hayden.bosworth@VA.gov