

Leveraging Patient Portals & Mobile Devices to Promote Patient Self-care

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Manage Practices
Statement Notifications

Please select your provider, the appropriate appointment category and desired location from the drop down lists below. Asterisk (*) denotes required field.

*Select provider/group: AAA Provider_Test

*Select category: Appointment Request

*Select location: Health Center At Union Address

*Disclaimer: If this is a medical emergency please Hang up and call 911. All appointments requested here must be for routine medical visits with your primary care physician and will be scheduled a minimum of three business days from the day of original request. All appointment request will be answered within 72 hours. If you are unable to keep this appointment please call 719-632-5700 to cancel test.

3) Submit Request

Please fill in all required fields and click the Submit button to submit your request.

*Reason for appointment: Sore Throat and Cough

*Priority: Normal

*Make appointment for: This Week

*Start date: 08/26/2013 End date: 09/01/2013

*Preferred date/time: Mon Tue Select the preferred date range

*Disclaimer: If this is a true medical emergency, please call 911, or call your nearest hospital or medical practice. Email and appointment request will be answered within 24 hours.

Submit

Foot & Ankle Institute

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Welcome Jason Keefe

My Prescription(s)

Last Refill	Drug	SIG	Doctor	Request	Refill	S	C
Jun 24, 2012	Genifroid						
Jun 24, 2012	METFORM						
Feb 28, 2011	ZYVOX 600 MG TABLET	Take 1 twice daily	COPE COPE				
Mar 15, 2011	LAMISIL 250 MG TABLET	1 PO qd	Andrew Povel				
Aug 03, 2011	LORTAB 7.5-500 TABLET MG	Take 1-2 every 4-6 hours as need for pain	Keith Reber				
May 24, 2011	LORTAB 7.5-500 TABLET MG	Take 1-2 every 4-6 hours as need for pain	Shel Cowley				
Mar 14, 2011	MEDROL 4 MG DOSEPAK	Take as directed	Shel Cowley				

Drug Education S Send Request Cancel Request

Dial 911 in the case of a medical emergency

Welcome to the University Health System Patient Portal

Sign In to Your Account

Email address

Password

Forgot your password? Sign In

Home Messages Appointments Medications Forms Insurance Statements My Health Record Accounts

Crista Helms

Quick Links

- Request an Appointment
- Refill a Medication
- Request a Referral

Appointments

Date / Time	Location	Provider	Patient
Thu, Oct 18 2012 @ 9:15 AM	Main Street	Lucia Harris	Crista Helms

Medications

Name	Start Date	Prescribed By	Source
TYLENOL ARTHRITIS	10/1/2012	Ricki Riddle	Community Physician Group
HYDROCHLOROTHIAZIDE	9/25/2012	Ricki Riddle	Community Physician Group
SYNTHROID	6/12/2012	Ricki Riddle	Community Physician Group
LEXAPRO	6/12/2012	Ricki Riddle	Community Physician Group
METFORMIN HCL	10/28/2011	Ricki Riddle	Community Physician Group

Lab Tests

Date	Lab Name	Flag
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Statements

Date	Provider	Balance
7/26/2010	Community Physician Group	\$32.14
4/23/2009	Community Physician Group	\$40.00
5/13/2008	Community Physician Group	\$5.38
12/27/2007	Community Physician Group	\$6.27
9/12/2007	Community Physician Group	\$23.52

WebMD Health via MedWorm.com

Study Questions the Value of Annual Physical Exams

Regular physical exams are annual rituals for many Americans. Now a new research review finds no evidence that these kinds of checkups help people live longer, or cut the risk of dying of cancer or heart disease. (Source: WebMD Health)

Cranberries Little Help Against UTIs

Drinking cranberry juice or taking cranberry pills may do little to prevent urinary tract infection (UTI), according to a new review of the latest research. (Source: WebMD Health)

Cholesterol Levels Down Among U.S. Adults

Cholesterol levels are dropping among U.S. adults, research shows. (Source: WebMD Health)

Please Enter your Login Credentials

User Name

Password

Sign In

Change/Reset Password Forgot Password?

Patient Portal

Home Profile Calendar Health Record Miscellaneous

Dashboard

Messages (3)

- Reminders
- Appt.
- Bill Pay
- Referrals
- Med. Refill
- Request Records
- E-Visit
- Forms
- Doc. Questionnaires

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General Info

Name: Holly B Carter

Sex: Female

Birthday: 11/22/1978

Primary Phone:

Secondary Phone:

Email: holly.demuro@nyamed.com

Medical Info

Height: 135 Pounds

Blood Type: N/A

General History: None Reported

Reminders

There are no upcoming events in your calendar.

Documents/Appointments

Holly B Carter

01/19/2011 04:30 PM | holly demuro, M.D. | IMH

Holly B Carter

01/03/2011 10:15 AM | holly demuro, M.D. | Office Visit IMH

Holly B Carter

12/27/2010 10:15 AM | holly demuro, M.D. | Office Visit IMH

Holly B Carter

12/24/2010 01:15 PM | holly demuro, M.D. | IMH

Messages

Holly B Carter, you have 3 New Message(s)

Health Trackers

Weight Measurement BMI Blood Pressure Blood Sugar Cholesterol Triglycerides

Weight

200.0 lb

150.0 lb

100.0 lb

50.0 lb

0.0 lb

03/07/2010 05/07/2010 07/14/2010 07/20/2010 07/26/2010 08/03/2010

MyHealthAtVanderbilt: policies and procedures governing patient portal functionality

Chandra Y Osborn, S Trent Rosenbloom, Shane P Stenner, et al.

J Am Med Inform Assoc 2011 18: i18-i23 originally published online July 31, 2011

doi: 10.1136/amiajnl-2011-000184



My Health at Vanderbilt

USER LOG IN

GUIDE

For Patients
and Visitors

Your user name

[Forgot your user name? Click here.](#)

Your password

[Forgot your password? Click here.](#)

login

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Understanding Patient Portal Use: Implications for Medication Management

Monitoring Editor: Gunther Eysenbach

Reviewed by Ryan Shaw and Pythia Nieuwkerk

[Chandra Y Osborn](#), PhD, MPH,^{1,2,3} [Lindsay Satterwhite Mayberry](#), PhD, MS,¹[Kenneth A Wallston](#), PhD,⁴ [Kevin B](#)[Johnson](#), MD, MS,^{2,5} and [Tom A Elasy](#), MD, MPH^{1,3}

**Among users, more
portal use associated
with better A1c
 $\rho = -0.30$, $p = .02$.**

Demographics	Patient portal use			<i>P</i> value ^a
	Nonusers (n=13)	Users (n=62)	Full sample (N=75)	
Age (years), mean (SD)	58.8 (10.9)	56.5 (8.4)	56.9 (8.8)	.52
Gender, n (%)				.20
Male	2 (15.4)	23 (37.1)	25 (33.3)	
Female	11 (84.6)	39 (62.9)	50 (66.7)	
Race, n (%)				<.001
Caucasian/white	1 (7.7)	46 (74.2)	47 (62.7)	
African American/black	11 (84.6)	14 (22.6)	25 (33.3)	
Education ^b (years), mean (SD)	13.2 (1.8)	15.2 (2.3)	15.0 (2.4)	.05
Income^b (US \$), n (%)				.005
≤39,999	6 (85.7)	12 (23.5)	18 (31.6)	
40,000-59,999	0 (0.0)	15 (29.4)	15 (26.3)	
≥60,000	1 (14.3)	24 (47.1)	24 (42.1)	
Insurance status^b, n (%)				<.001
Private	1 (14.3)	47 (87.0)	48 (78.7)	
Public	5 (71.4)	6 (11.1)	11 (18.0)	
None	1 (14.3)	1 (1.9)	2 (3.3)	
Number of diabetes medications, mean (SD)	1.3 (0.7)	1.3 (0.8)	1.3 (0.8)	.84
Type of diabetes medications, n (%)				.56
Oral agents only	11 (84.6)	40 (64.5)	51 (69.9)	
Insulin only	1 (7.7)	8 (12.9)	9 (12.3)	
Both	1 (7.7)	12 (3.3)	13 (17.8)	
Diabetes duration ^b (years), mean (SD)	7.8 (7.5)	8.0 (6.0)	8.0 (6.1)	.72
Body mass index ^b , mean (SD)	39.2 (12.7)	34.4 (10.2)	35.0 (10.5)	.35
A1C (%), mean (SD)	7.1 (1.6)	7.2 (1.6)	7.3 (1.6)	.71

Secure messaging and diabetes management: experiences and perspectives of patient portal users

Ashley E Wade-Vuturo, Lindsay Satterwhite Mayberry and Chandra Y Osborn

J Am Med Inform Assoc 2013 20: 519-525 originally published online December 15, 2012

doi: 10.1136/amiajnl-2012-001253



Table 4 Relationships between self-reported frequency of patient portal feature use and glycemic control among patient portal users (N=54)

			Spearman's ρ											
			Feature number											
Feature number	How often do you use MHAV to...	Percentage reporting frequent use† (%)	1	2	3	4	5	6	7	8	9	10	A1c value	
1	Review laboratory results?	76	1.00										NS	
2	View your medical record?	61	0.69**	1.00									NS	
3	Send a message to your doctor? (SM)	63	0.60**	0.63**	1.00								−0.26#	
4	Request an appointment? (SM)	36	NS	0.36**	0.36**	1.00							−0.29*	
5	Access billing information?	19	NS	0.31*	NS	0.31*	1.00						NS	
6	Access telephone directory?	19	NS	NS	NS	NS	NS	1.00					NS	
7	Find a doctor?	11	NS	NS	NS	NS	0.37**	0.31*	1.00				NS	
8	Pay medical bills?	11	NS	NS	NS	NS	0.66**	0.36**	0.38**	1.00			NS	
9	Access clinic maps/directions?	6	NS	NS	NS	NS	0.36**	0.52**	0.59**	0.37**	1.00		NS	
10	Access insurance information?	2	NS	NS	NS	0.37**	0.56**	NS	NS	0.44**	0.33*	1.00	NS	

#p<0.08; *p<0.05; **p<0.01.

†Self-reported use of MHAV features; ≥ 4 indicate frequent use (on a scale from 1='never' to 6='very often').

A1c, hemoglobin A1c; MHAV, MyHealthAtVanderbilt; NS, not significant; SM, secure messaging.

Patient Web Portals to Improve Diabetes Outcomes: A Systematic Review

Chandra Y. Osborn · Lindsay Satterwhite Mayberry ·
Shelagh A. Mulvaney · Rachel Hess

Published online: 2 October 2010
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Abstract Patient web portals (PWP), defined as the integration of electronic medical records and patient health records, have been related to enhanced patient outcomes. A literature review was conducted to characterize the design and evaluation of PWPs to improve health care processes and outcomes in diabetes. A summary of 26 articles revealed the positive impact PWPs have on patient outcomes, patient-provider communication, disease management, and access to and patient satisfaction with health care. Innovative and useful approaches included the evaluation of specific components of the PWPs, assessing the impact of PWPs on mediators of health behaviors, such as patient distress, identification of barriers to use, and patient willingness to pay for access. Future research should focus on relevant processes that mediate patient and provider use, impact on health care utilization, and a

patient-centered approach to the design and integration of educational opportunities afforded through PWPs.

Keywords Patient web portal · Systematic review · Diabetes · Evaluation · Usability · Personal health record · Glycemic control · Type 1 · Type 2 · Providers · Caregivers · Behaviors · Quality of life · Diabetes Management · Communication

Introduction

There has been an explosive increase in patients with diabetes around the world. The economic burden is substantial, and the increase in morbidity and mortality associated with diabetes strains on the global economy [2]. The consequences are preventable [3].

The management of diabetes requires coordinated care among providers, endocrinologists, nurses, dietitians, and patient education, including lifestyle changes, nutrition and physical activity, and pharmacologic therapy to facilitate optimal health. Yet, with the growing number of primary care providers, a shortage of face-to-face medical visits, and the option for ongoing diabetes care.

In 2001, the Institute of Medicine [5], called for a "Quality Chasm" among patients with chronic conditions, care providers, provision of patient management skills, and accessible web-based monitoring,



Patient portal use associated with better:

- patient-provider communication¹⁻⁴
- patient satisfaction¹⁻⁴
- self-care adherence^{1,2,4-5}
- diabetes and other clinical outcomes^{1,4-5}

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Springer

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[3] van der Vaart et al. *BMC Musculoskelet Disord*. 2014; 15: 102-110

[4] Otte-Trojel et al. *J Am Med Inform Assoc*. 2014; 21:751-757

[5] Lau et al. *Can J Diabetes*. 2014; 38:17-21

In short...

- **Weaker evidence on clinical outcomes**
- Few RCTs of portal use on outcomes
- Non-users:
 - lack Internet access
 - >65 years old
 - racial/ethnic minorities
 - low SES
 - limited health literacy

Cellphone Ownership Is Common Across All Major Demographic Groups

% of U.S. adults who own a cellphone

U.S. adults	92
Sex	
Men	92
Women	92
Race/ethnicity	
White	91
Black	94
Hispanic	92
Age group	
18-29	98
30-49	96
50-64	90
65+	78
Household income	
<\$30K	86
\$30K-\$49,999	94
\$50K-\$74,999	91
\$75K+	98
Educational attainment	
Less than high school	86
High school	90
Some college	93
College+	95
Community type	
Urban	94
Suburban	92
Rural	87

Source: Pew Research Center survey conducted March 17-April 12, 2015. Whites and blacks include only non-Hispanics. N=1,907

PEW RESEARCH CENTER

- 92% of U.S. adults have a cell phone
- Who uses health apps?
 - 19% of cell phone users
 - 1-2% low SES/minorities
- Who text messages?
 - 81% of cell phone users
 - 78-85% low SES/minorities





Table 1—Participant characteristics and differences by race and health literacy status

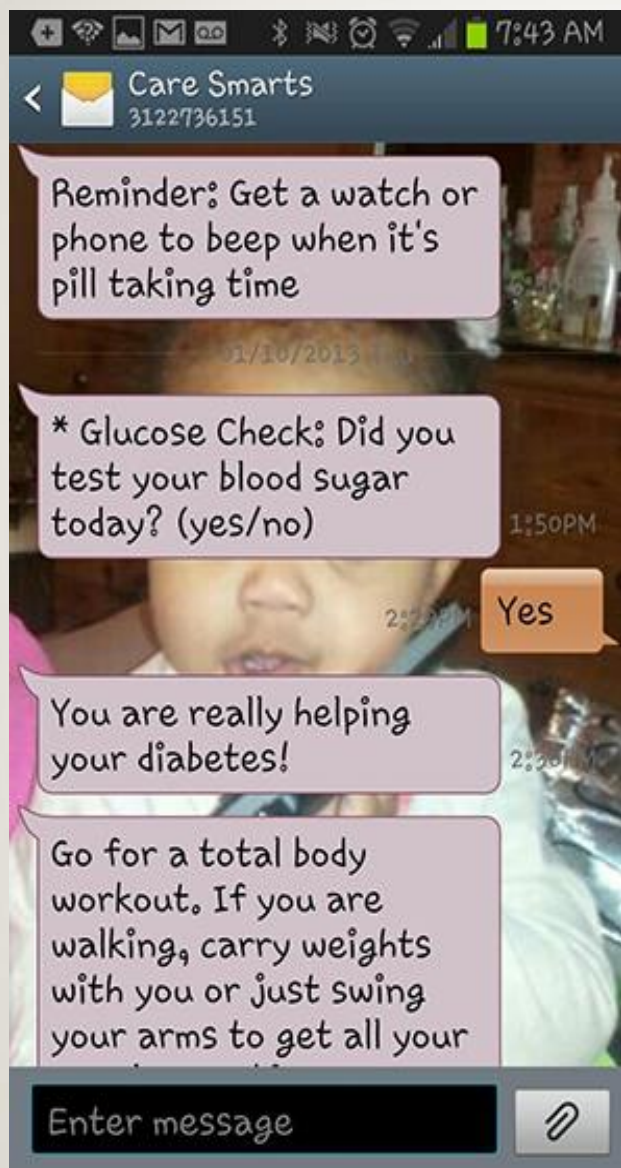
	Race				HL			
	Total* n = 283	NHW n = 116	AA/black n = 167	P	Total† n = 280	Limited n = 79	Adequate n = 201	P
Demographics								
Age, years	52.4 ± 11.6	54.7 ± 10.6	50.8 ± 12.0	<0.01	52.6 ± 11.5	59.2 ± 11.1	50.0 ± 10.6	<0.001
Gender, female	65.0 (184)	54.3 (63)	72.5 (121)	<0.01	65.0 (182)	59.5 (47)	67.2 (135)	0.23
Education, years	12.1 ± 2.7	12.3 ± 2.9	12.0 ± 2.6	0.49	12.1 ± 2.7	10.4 ± 2.3	12.8 ± 2.6	<0.001
Income, \$								
<10,000	45.5 (116)	43.1 (47)	47.3 (69)	0.76	45.2 (114)	51.4 (37)	42.8 (77)	<0.05
10,000–15,000	26.7 (68)	28.4 (31)	25.3 (37)		27.0 (68)	34.7 (25)	23.9 (43)	
15,000–20,000	14.1 (36)	15.1 (14)	15.1 (22)		13.9 (35)	8.3 (6)	16.1 (29)	
>20,000	13.7 (35)	15.6 (17)	12.3 (18)		13.9 (35)	5.6 (4)	17.2 (31)	
Insured, yes	57.9 (164)	51.7 (60)	62.3 (104)	0.08	57.9 (162)	74.7 (59)	51.2 (103)	<0.001
Diabetes characteristics								
Insulin use, yes	47.0 (133)	42.2 (49)	50.3 (84)	0.18	46.8 (131)	48.1 (38)	46.3 (93)	0.78
Diabetes duration, years	8.0 ± 6.9	7.9 ± 6.2	8.1 ± 7.3	0.86	8.0 ± 6.8	9.1 ± 7.4	7.5 ± 6.6	0.08
Technology use								
Own a computer?	49.1 (139)	51.7 (60)	47.3 (79)	0.46	49.3 (138)	22.8 (18)	59.7 (120)	<0.001
With Internet?	39.9 (113)	44.8 (52)	36.5 (61)	0.16	40.0 (112)	16.5 (13)	49.2 (99)	<0.001
Comfortable with computer?	59.6 (168)	56.0 (65)	62.0 (103)	0.31	59.1 (165)	33.3 (26)	69.1 (139)	<0.001
Use an e-mail account?	41.7 (118)	46.5 (54)	38.3 (64)	0.17	41.8 (117)	10.1 (8)	54.2 (109)	<0.001
Use Internet for diabetes info?	42.4 (120)	47.4 (55)	38.9 (65)	0.15	42.9 (120)	11.4 (9)	55.2 (111)	<0.001
Use Internet for medication info?	40.6 (115)	46.5 (54)	36.5 (61)	0.09	41.1 (115)	10.1 (8)	53.2 (107)	<0.001
Have a cell phone?	87.6 (248)	87.1 (101)	88.0 (147)	0.81	87.9 (246)	73.4 (58)	93.5 (188)	<0.001
Comfortable with cell phone?	85.5 (242)	83.6 (97)	86.8 (145)	0.45	86.1 (241)	70.9 (56)	92.0 (185)	<0.001
Use text messaging?	47.3 (134)	44.0 (51)	49.7 (83)	0.34	47.5 (133)	25.3 (20)	56.2 (113)	<0.001
Use Internet on cell phone?	17.7 (50)	15.5 (18)	19.2 (32)	0.43	17.5 (49)	3.8 (3)	22.9 (46)	<0.001
Glycemic control (A1C %)	8.1 ± 2.2	7.6 ± 2.0	8.5 ± 2.3	<0.01	8.1 ± 2.2	7.9 ± 2.2	8.2 ± 2.2	0.33

Data are presented as mean ± SD or % (n). *NHW and AA/black participants only; †NHW and AA/black participants who completed the Short Test of Functional Health Literacy in Adults.

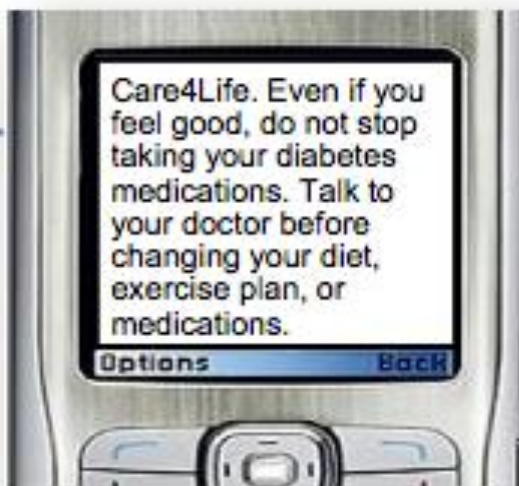
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The opinions expressed in this article are those of the authors and do not necessarily reflect the views of the National Institutes of Health.
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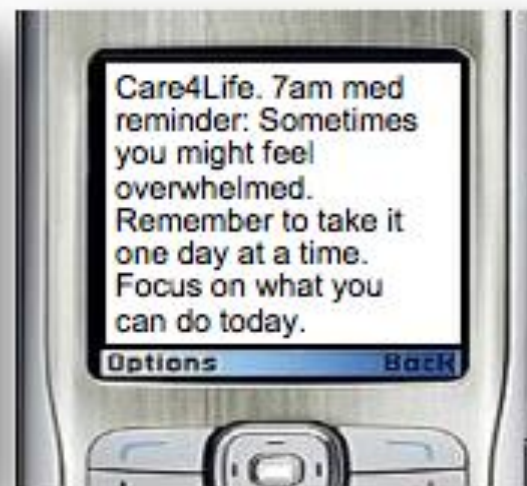
9% of cell phone users text for health



Education



Medication reminder



Disparities in the use of a mHealth medication adherence promotion intervention for low-income adults with type 2 diabetes

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OXFORD
UNIVERSITY PRESS

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ABSTRACT

Objective Mobile health (mHealth) interventions may improve diabetes outcomes, but require engagement. Little is known about what factors impede engagement, so the authors examined the relationship between patient factors and engagement in an mHealth medication adherence promotion intervention for low-income adults with type 2 diabetes (T2DM).

Materials and Methods Eighty patients with T2DM participated in a 3-month mHealth intervention called MESSaging for Diabetes that leveraged a mobile communications platform. Participants received daily text messages addressing and assessing medication adherence, and weekly interactive automated calls with adherence feedback and questions for problem solving. Longitudinal repeated measures analyses assessed the relationship between participants' baseline characteristics and the probability of engaging with texts and calls.

Results On average, participants responded to 84.0% of texts and participated in 57.1% of calls. Compared to Whites, non-Whites had a 63% decreased relative odds (adjusted odds ratio [AOR] = 0.37, 95% confidence interval [CI], 0.19–0.73) of participating in calls. In addition, lower health literacy was associated with a decreased odds of participating in calls (AOR = 0.67, 95% CI, 0.46–0.99, $P = .04$), whereas older age ($P_{\text{nonlinear}} = .01$) and more depressive symptoms (AOR = 0.62, 95% CI, 0.38–1.02, $P = .059$) trended toward a decreased odds of responding to texts.

Conclusions Racial/ethnic minorities, older adults, and persons with lower health literacy or more depressive symptoms appeared to be the least engaged in a mHealth intervention. To facilitate equitable intervention impact, future research should identify and address factors interfering with mHealth engagement.

Keywords: mHealth, patient engagement, medication adherence, type 2 diabetes mellitus, disparities

BACKGROUND AND SIGNIFICANCE

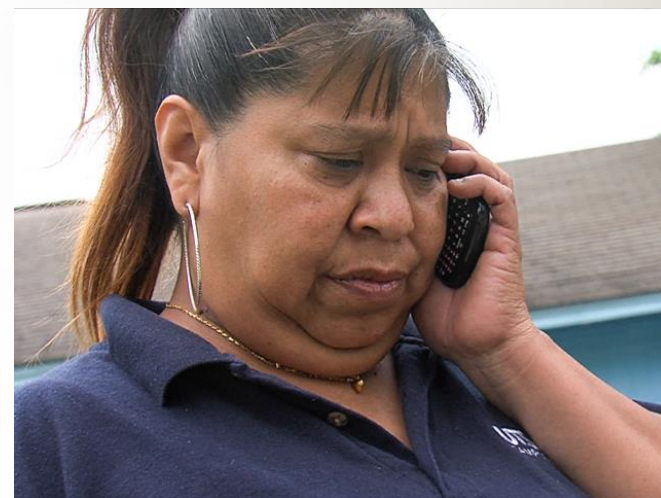
Among adults with type 2 diabetes (T2DM), nonadherence to medications is common,^{1,2} especially among lower-income racial/ethnic minorities.^{3,4} Medication nonadherence is associated with having worse glycemic control,^{5,6} an increased risk of hospitalizations,^{2,7} premature death,^{2,7} and higher healthcare costs.⁸ Despite nonadherence being more prevalent among minorities and low socioeconomic status (SES) groups, research aimed at understanding and improving medication adherence for these individuals has been limited.^{9,10}

Cell phones can deliver medication adherence support to patients with diabetes. Approximately 90% of US adults use cell phones,¹¹ and find it essential for daily functioning.¹² In 2013, secure messaging ser-

However, only 2 of the 10 studies were conducted in the United States,^{18,19} with just one involving low SES community health center patients that improved patients' self-efficacy, but not their glycemic control.¹⁹ Not included in that meta-analysis was a 12-month SMS intervention study that enrolled 32 African Americans with T2DM from a community health center, and found a reduction in hospitalizations and emergency room visits *only* among patients who engaged with the intervention for 12 months.²⁰

Patient engagement is critical to reaping an intervention's potential benefits, and varied use and/or nonuse may compromise intervention efficacy. While patients with diabetes rate mobile health (mHealth) interventions favorably,²¹ patients often respond to less than or near

MED Pilot Study



- Racial/ethnic minorities had a 63% lower odds of participating in calls.
- Lower health literacy was associated with lower call participation.
- Younger and older age, and more depressive symptoms were associated with less text message responses.

MED Pilot Study

- One- and two-month adherence improved, $p < .05$.
- Barriers were reduced over time, $p < .05$.
- Barrier reductions were associated with improved glycemic control, $p < .05$.

Feedback

- Texts more valuable & reliable than IVR
- Add diet/exercise texts, reduce repetitive texts, and add novel information.

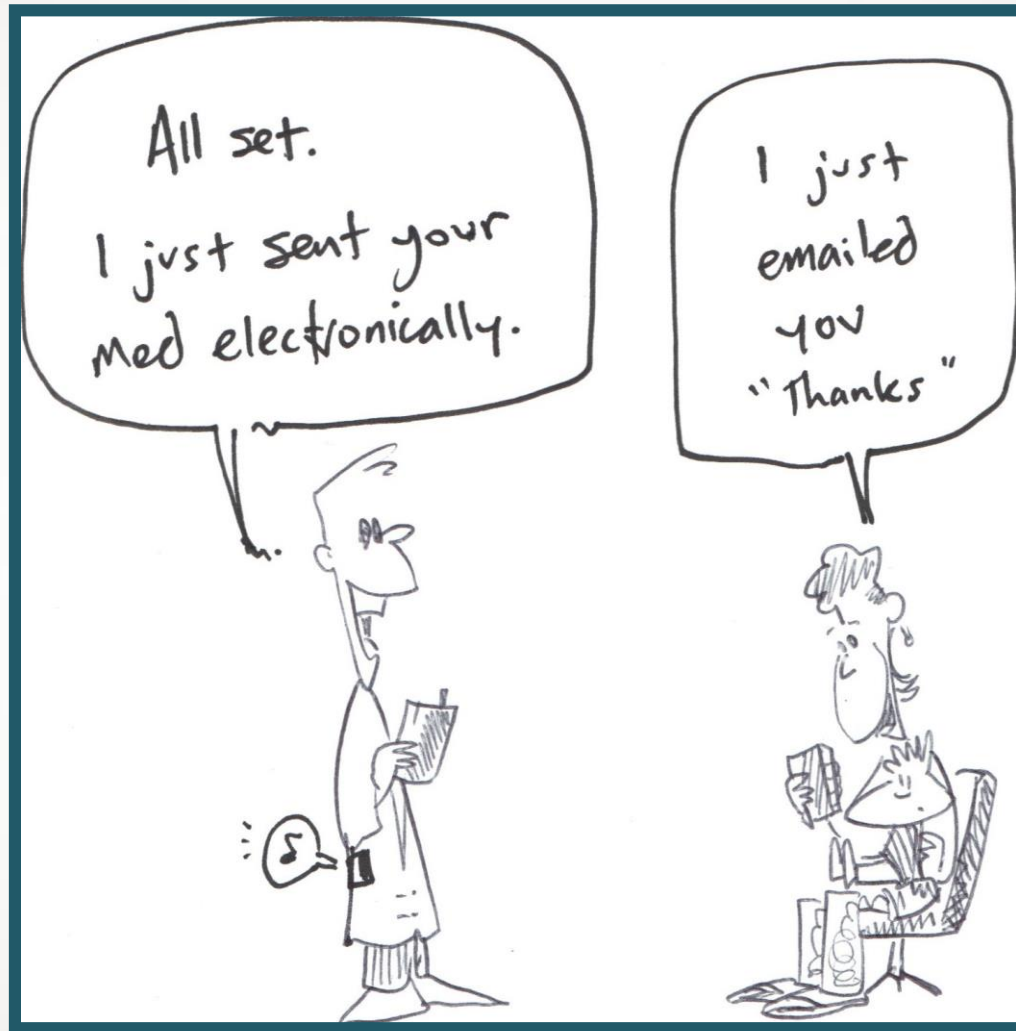


REACH

Recommendations

- Patient Portals
 - Extend incentives for portals with mobile compatibility
 - Incorporate user-centered design
 - Offer training on portal use
 - Need RCTs to test effect on clinical outcomes
- Text Messaging Interventions
 - Add human element
 - Add Internet elements
 - Use research designs that allow for self-tailoring

Thank you!



Contact:

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