

Chat 4 Heart Health: Using Artificially Intelligent Text Messaging Technology to Improve American Heart Association's Life's Essential 8 Health Behaviors

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**NIH PRAGMATIC TRIALS
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Objective

- Use an artificially intelligent chatbot to deliver text messages and interact with patients to help them improve their control of AHA's Life's Essential 8 (LE8) lifestyle factors: blood glucose, cholesterol, blood pressure, physical activity, weight, diet, sleep, and smoking

Study population and setting

- Clinics in 3 healthcare systems that care for large populations that experience health disparities: Denver Health and Hospital Authority, Salud Family Health Centers, and STRIDE Community Health Center
- English/Spanish-speaking primary care patients with:
 - Diagnosis of >1 of the following cardiovascular risk factors: hypertension, diabetes, hyperlipidemia
 - Risk factor poor or intermediate as defined by LE8 (eg, BP > 140/90 mm Hg)

Study design

- Pragmatic clinical trial with patient-level randomization testing the comparative effectiveness of 3 text messaging delivery strategies:
 - Generic text messages
 - Interactive AI-based chatbot text messaging that uses evidenced-based communication strategies with attention to patient context and sociocultural factors that influence self-management
 - Interactive AI-based chatbot text messaging plus proactive pharmacist management

Generic text group



- Eating well is one of the best ways to manage diabetes, hypertension and high cholesterol.
- Consider including a variety of colorful fruits and vegetables in your meals, opting for whole grains, and choosing lean proteins.
- Your health is a long-term investment, and making nutritious food choices is a great way to ensure a healthier, happier future.

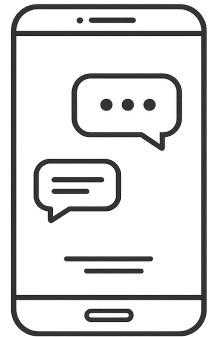
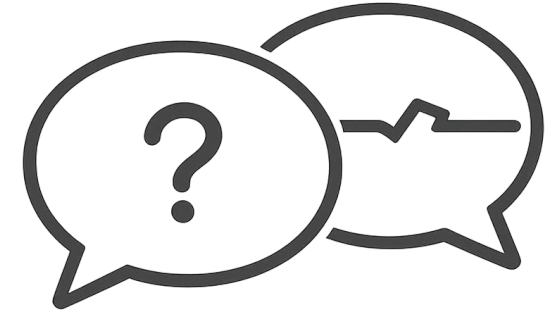
Interactive chatbot text groups



- People who live to be 100 eat a healthy diet, including whole grains, beans, fruits, and vegetables. They also eat less meat and cheese overall. Here is a good starter list of the healthiest food to eat: <https://www.ucsfhealth.org/education/top-ten-foods-for-health>. (This links to the website with the list of healthy foods)
- If you find it expensive to buy healthy food, you are not alone. 1 in 3 people in Colorado struggle to afford food. Hunger Free Colorado is a great resource for information on local food pantries & for info on help to pay for food & programs to bring meals to you. (This links to Hunger Free CO)
- You're making great choices with foods lower in calories, fat & sugar, but high in fiber & protein are great. Like this chicken fajita recipe for example: <https://www.mayoclinic.org/healthy-lifestyle/recipes/chicken-fajitas/rcp-20049943>. Chicken breasts are low fat & high protein; recipes with vegetables are low calorie & high fiber.

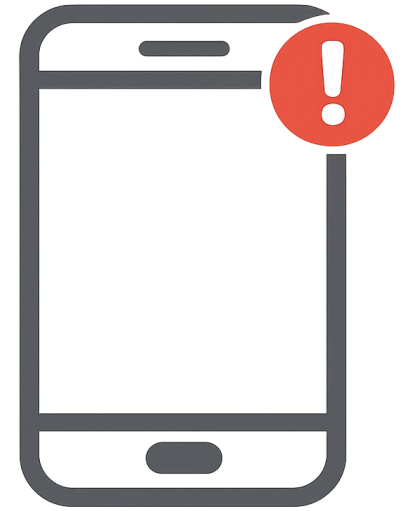
Misunderstood and off-topic patient messages

- "I don't have a family here just me"
- "Is the survey sent to my email?"
- "Is someone going to call me about this study?"
- "Who's this?"
- "Is this chat monitored by a human?"
- "Who are you?"
- "How can I slow down cod?"
- Chatbot often struggled to respond to prompts like these



In case of emergency

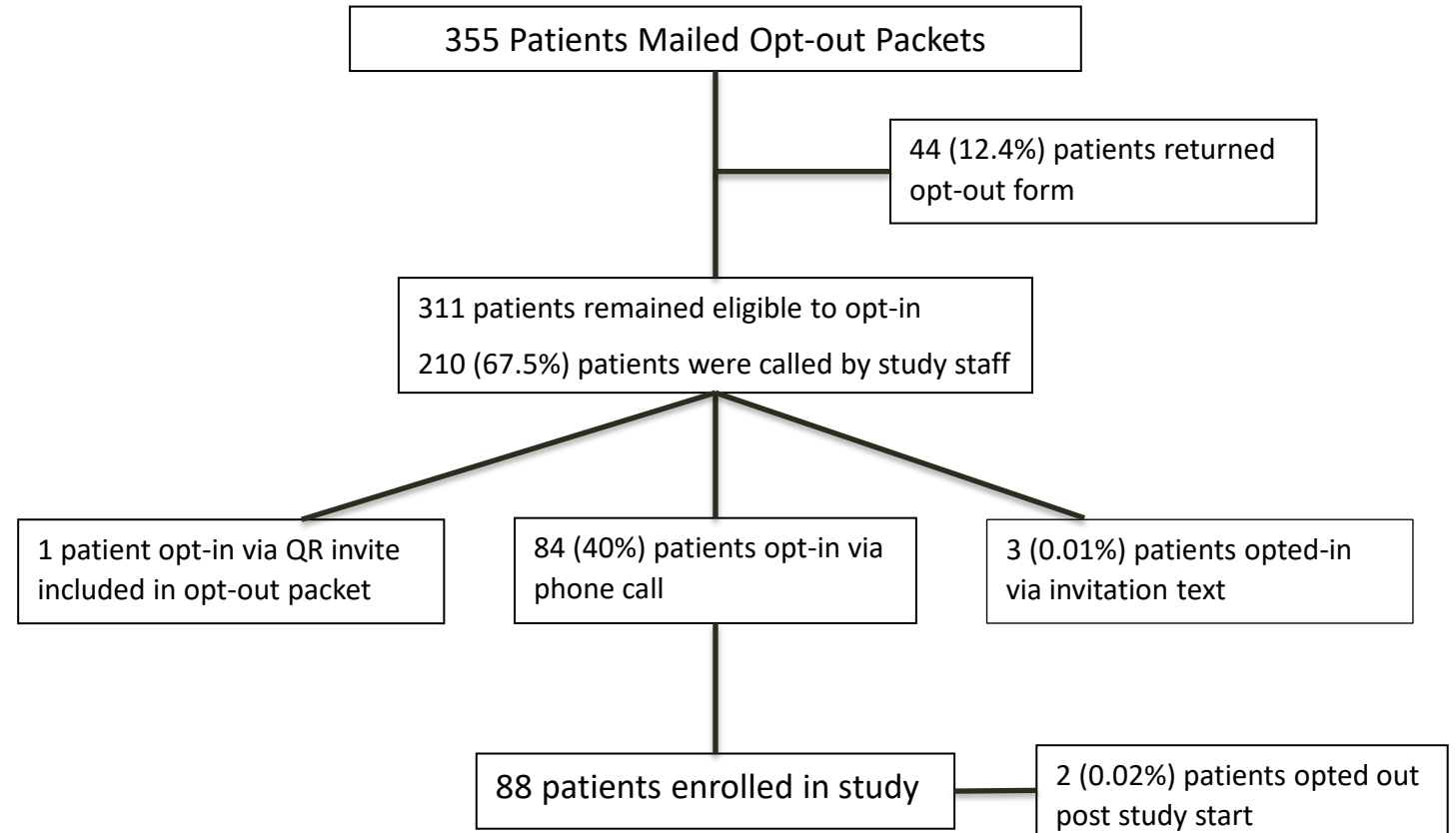
- Patient: "Just curious—are you a real person or an AI?"
- Chatbot response: "I am a chatbot (not a real person). For help from our team, please call (303) 436-6000 between 8 and 5 during the week. Call 911 if you have a medical emergency."



Enrollment process

- Patients mailed study info packet, including study information, opt-out form, opt-in form with QR code, and study phone number
- If patient does not opt out of study, need to get opt-in to study text messages
 - EHR invitation message
 - Study staff calls patients
 - EHR-enabled text message

Enrollment experience from UG3 pilot



Outcomes

- Primary outcome:
 - Change in LE8 measure at 7 and 12 months
- Secondary outcomes
 - Individual components of the LE8
 - Patient self-efficacy
 - Clinical events
- Anticipated sample size
 - 2097 patients