PERSONALIZED PATIENT DATA AND BEHAVIORAL NUDGES TO IMPROVE ADHERENCE TO CHRONIC CARDIOVASCULAR MEDICATIONS

The Nudge Project: Overview and Status

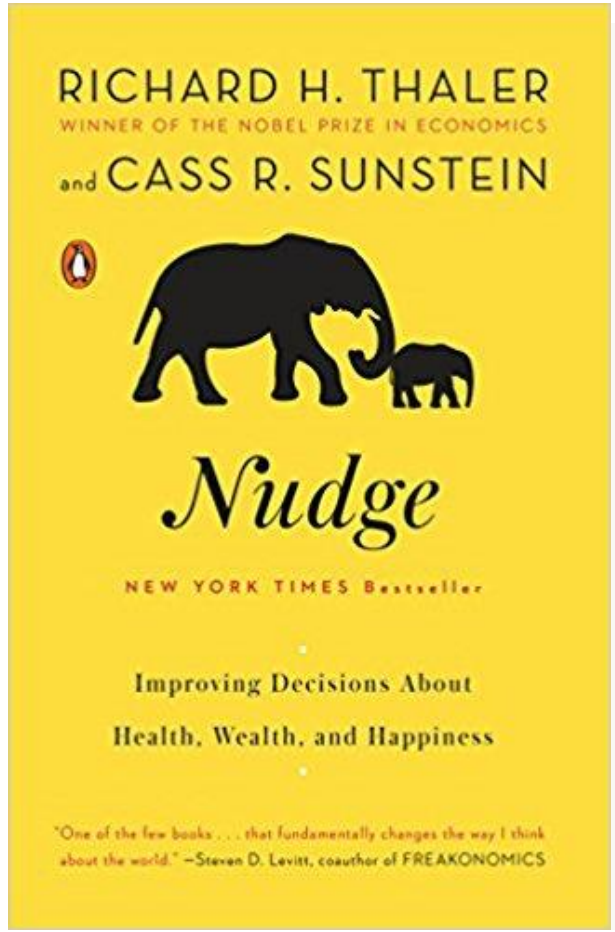
PIs: Mike Ho, MD, PhD & Sheana Bull, PhD, MPH

Adherence is low-hanging fruit:
“Medications don’t work if you don’t take them.”

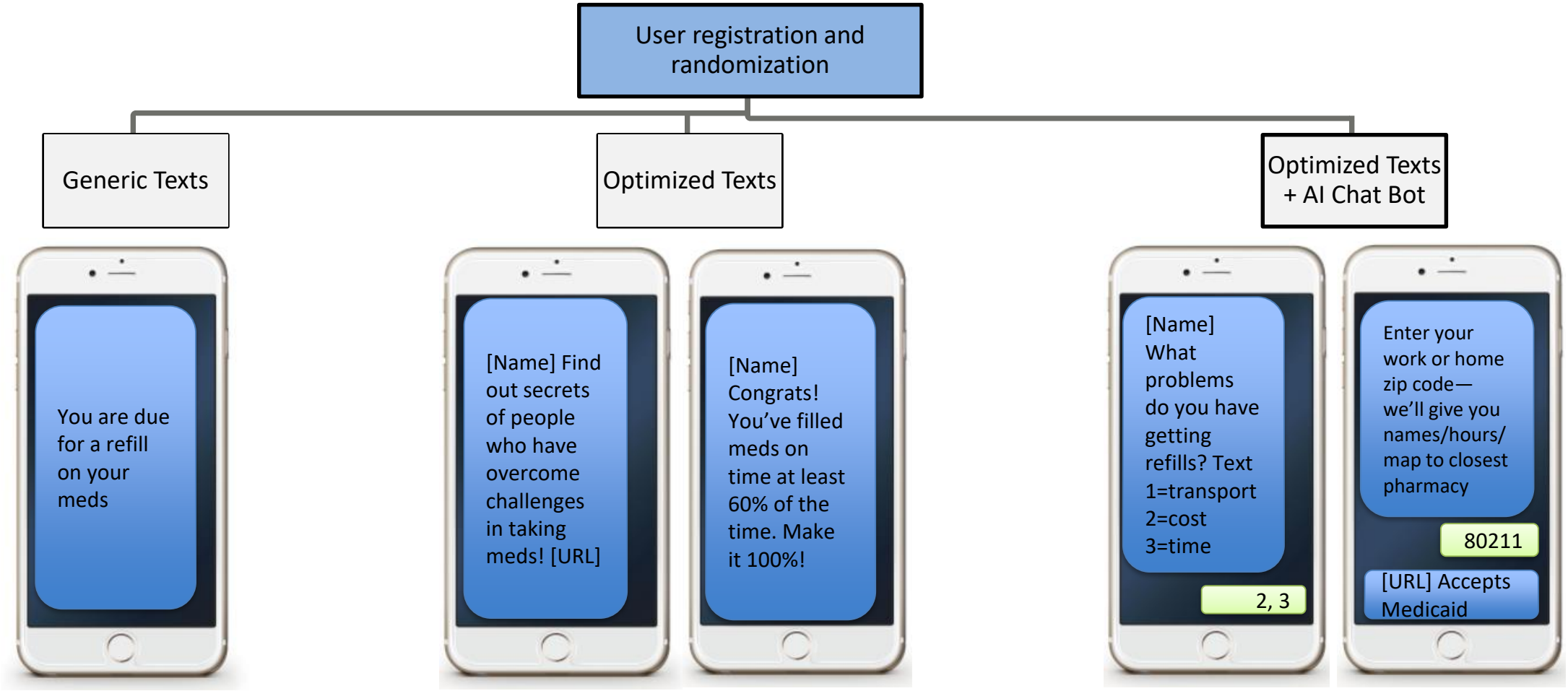
- Up to 50% of patients do not take their cardiovascular medications as prescribed, leading to increased mortality, adverse events such as heart attacks, and healthcare costs (e.g. MI-FREEE data).
- Previous attempts to improve adherence are costly, time-consuming, and have demonstrated inconsistent benefit.

Leverage principles of behavioral economics to nudge people to do the right thing

- A “Nudge” is the idea that a strategic reminder can help people adopt healthy behaviors.
  - Nobel prize winning economists (e.g. Dan Kahneman and Richard Thayler) have shown this can work to improve nutrition, physical activity and other behaviors
- Because patients almost universally use cell phones, we can adapt the idea of a “Nudge” to the cell phone very easily.
- We aim to improve medication adherence by sending Nudges over the phone, which can specifically respond to patient needs.



Interventions to be developed and tested



Participants will receive generic messages multiple times until refill completed

Participants will receive diverse optimized texts until refill completed

Participants will receive AI chat after two optimized texts to assist in reducing specific barriers to refill

Overview of Nudge: Year 1, Aim 1

- **Develop and test tools, infrastructure, and procedures** needed for a proposed large, multi-center, randomized trial.
  - **Develop and refine library of behavioral messages**
    - N of 1 trials (n=20 from each site)
    - Stakeholder Engagement Panel (12 people total: 4 people from each of the three settings, including 2 patients, 1 pharmacist, and 1 person involved in the HCS leadership/operations).
  - **Establish patient identification, eligibility, and randomization procedures across the 3 sites**

Overview of Nudge: Year 1, Aim 2

- **Pilot intervention delivery** to demonstrate feasibility of and preliminary effects within 3 engaged healthcare systems.
  - *Deliver Nudge messages (via text messaging and IVR) at each site*
    - Opt-out consent
    - N=30 at each HCS
  - *Solicit feedback from patient, provider, and health system stakeholders*
  - *Develop final protocol for UH3 RCT*

Trial Patient Population

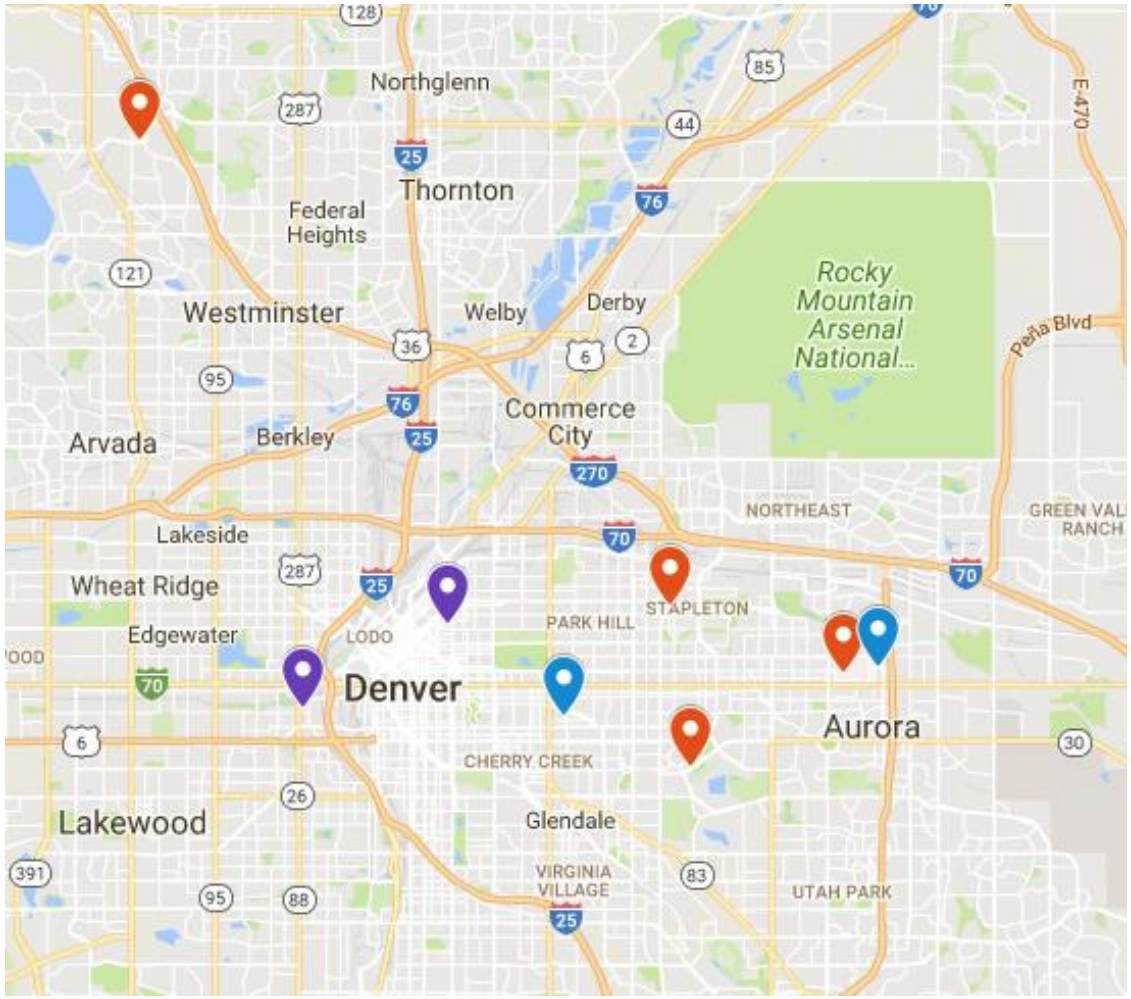
- Adult cardiovascular patients diagnosed with ≥ 1 condition of interest, prescribed ≥ 1 medication of interest, with a refill gap of at least 7 days

Condition	Classes of medications
Hypertension	Beta-blockers (B-blockers), Calcium Channel Blocker (CCB), Angiotensin converting enzyme inihibitors (ACEi), Angiotensin Receptor Blockers (ARB), Thiazide diuretic
Hyperlipidemia	HMG CoA reductase inhibitor (Statins)
Diabetes	Alpha-glucosidase inhibitors, Biguanides, DPP-4 inhibitors, Sodium glucose transport inhibitor, Meglitinides, Sulfonylureas, Thiazolidinediones, and statins
Coronary artery disease	PGY-2 inhibitor (Clopidogrel, Ticagrelor, Prasugrel, Ticlopidine), B-blockers, ACEi or ARB and statins
Atrial fibrillation	Direct oral anticoagulants, B-blockers, CCB

- Patients at one of three participating healthcare systems
- English or Spanish-speaking

Setting

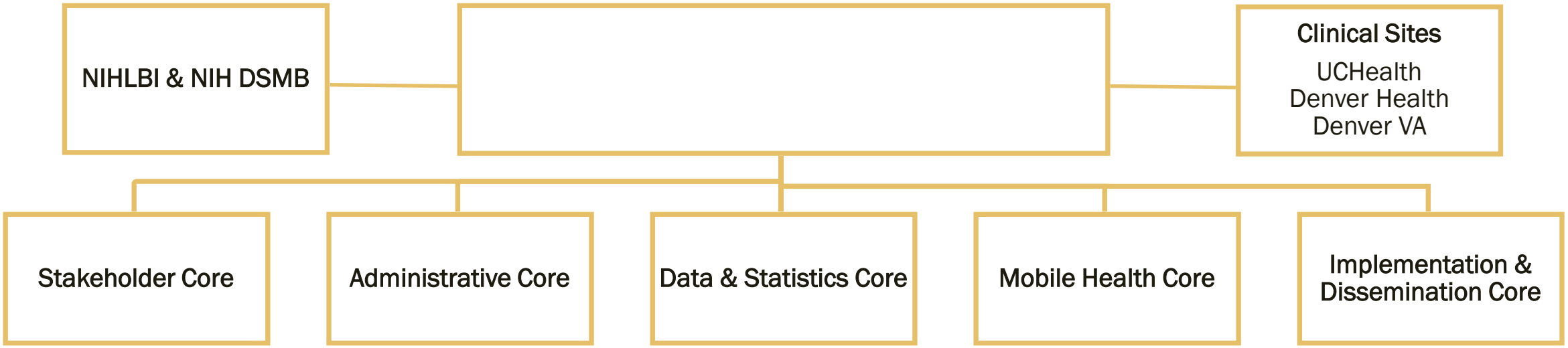
- 8 family medicine and internal medicine clinics in the Denver Metro area
  - *Denver Health*
  - *UCHealth*
  - *VA Eastern Colorado Health System*



Milestones

1. Obtain regulatory approval and contractual agreements across the 3 systems
2. Develop and refine library of behavioral messages for Nudge intervention
3. Establish patient identification, eligibility, randomization procedures across the 3 sites
4. Deliver Nudge messages (via text messaging or IVR) at each site
5. Complete data management and analytic plan
6. Develop final, NHLBI-approved study protocol for UH3 trial
7. Develop evaluation and dissemination plan

Workgroups


NIHLBI & NIH DSMB
Clinical Sites
UCHealth
Denver Health
Denver VA
Stakeholder Core
Administrative Core
Data & Statistics Core
Mobile Health Core
Implementation & Dissemination Core

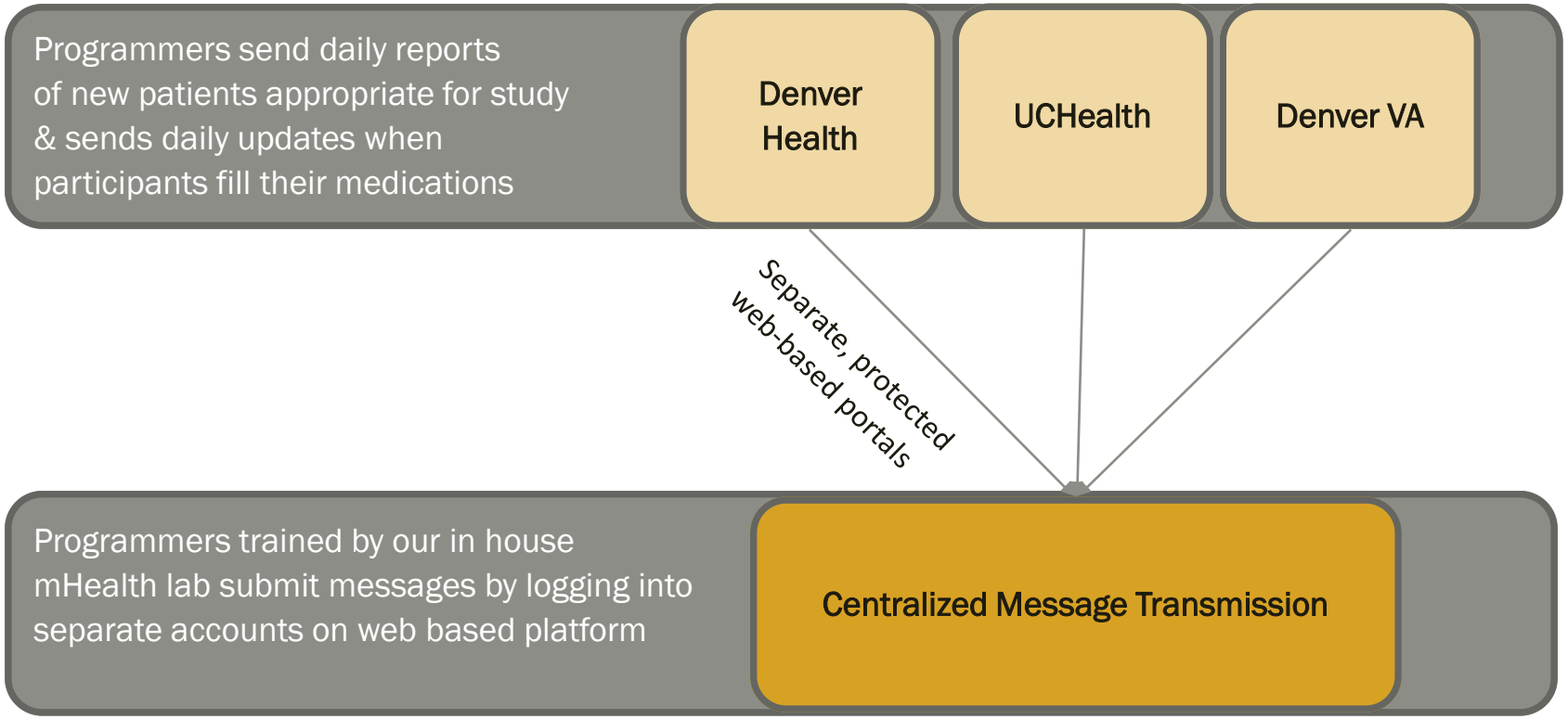
Barriers Scorecard

Barrier	Level of Difficulty				
	1	2	3	4	5
Enrollment and engagement of patients/subjects		✓			
Engagement of clinicians and health systems		✓			
Data collection and merging datasets					
			✓		
Implementing/delivering intervention across healthcare organizations				✓	

Data Sharing

- *Current data plan*
  - *Data remain behind each institution's firewall*
  - *Web-based portals*
  - *Messages are sent from a centralized team*
- *Obstacles*
  - *IRB*
- *Data Sharing*
  - *Technical and practical knowledge*
  - *Data collection instruments and assessment algorithms*
  - *Message library*
  - *Group-level data*

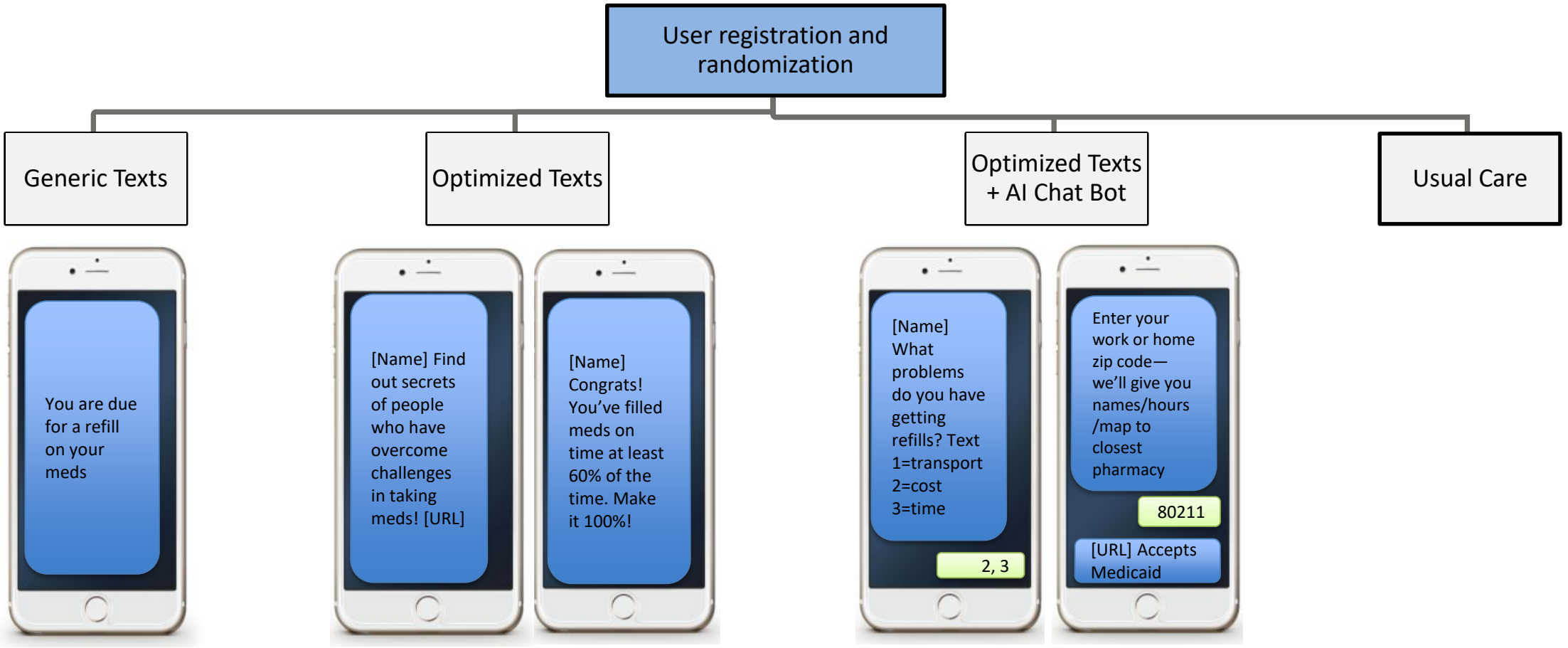
Data Sharing



If we do the first 9 months well..
Phase II (UH3)

1. Conduct a pragmatic patient-level randomized intervention of ”nudges” across the 3 healthcare systems to improve adherence to chronic CV medications.
   - *Primary outcome: medication adherence*
   - *Secondary outcomes: intermediate clinical measures (e.g., BP control), CV clinical events (e.g., hospitalizations), healthcare utilization, and costs*
2. Evaluate the implementation to inform local tailoring, adaptations, and modifications.

UH3 Intervention



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Questions?

michael.ho@ucdenver.edu

sheana.bull@ucdenver.edu