

Personalized Patient Data and Behavioral Nudges to Improve Adherence to Chronic Cardiovascular Medications (The Nudge Study)

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**NIH PRAGMATIC TRIALS
COLLABORATORY**

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Study objectives

- Conduct a pragmatic patient-level randomized intervention across 3 HCS to improve adherence to chronic CV medications.
 - Primary outcome: Medication adherence defined by the proportion of days covered (PDC) using pharmacy refill data.
 - Secondary outcomes:
 - Intermediate clinical measures (e.g., BP control)
 - CV clinical events (e.g., hospitalizations)
 - Healthcare utilization
 - Costs

Study setting



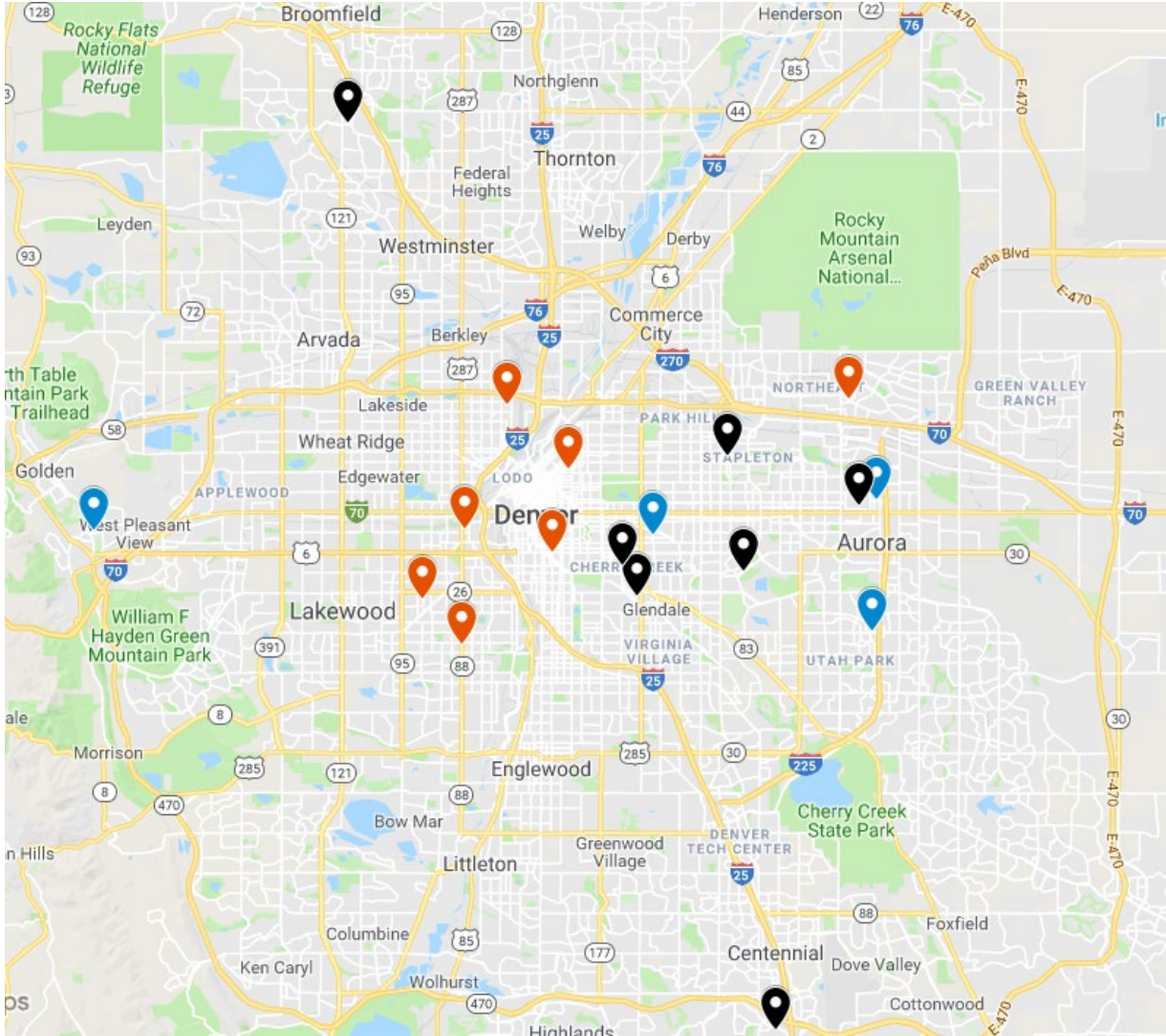
Denver Health Clinics



VA Eastern Colorado HCS Clinics



UCHealth Clinics



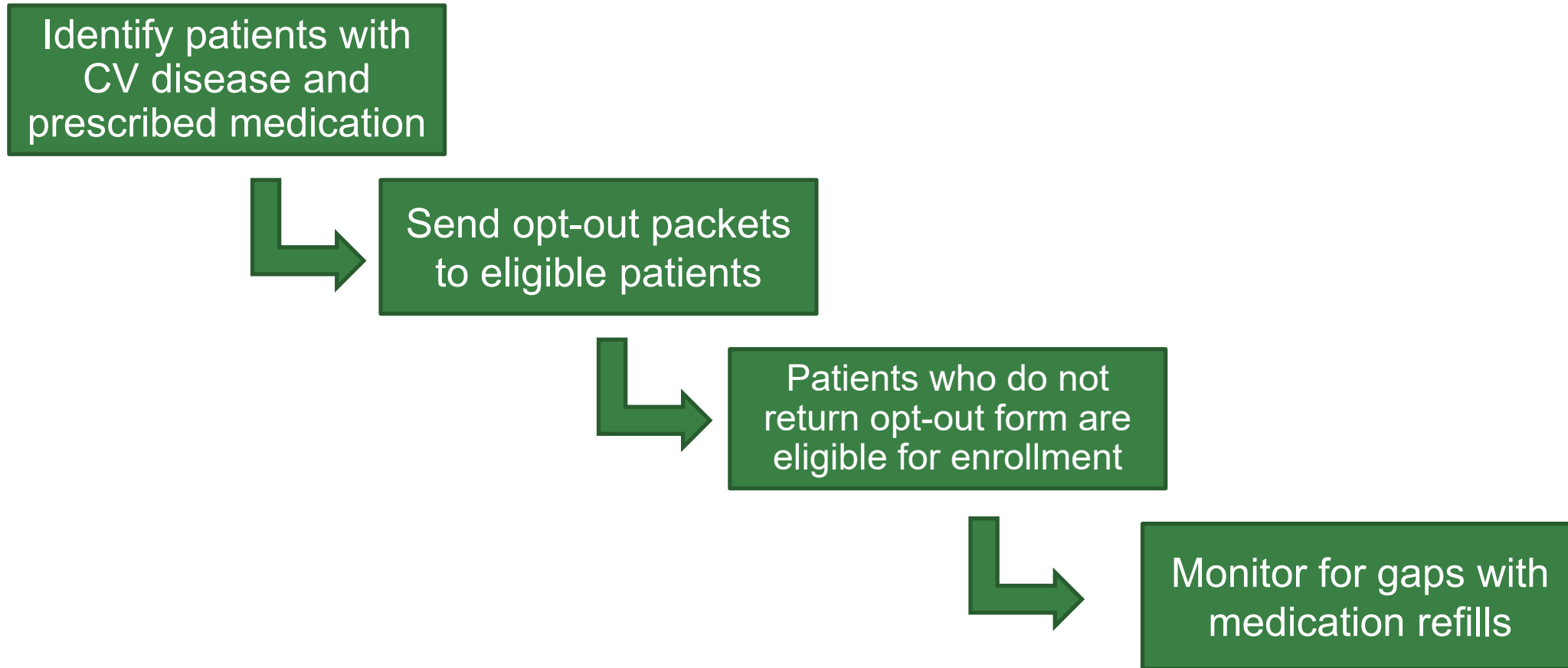
Patient population

- Adult patients diagnosed with ≥ 1 condition of interest and prescribed ≥ 1 medication of interest

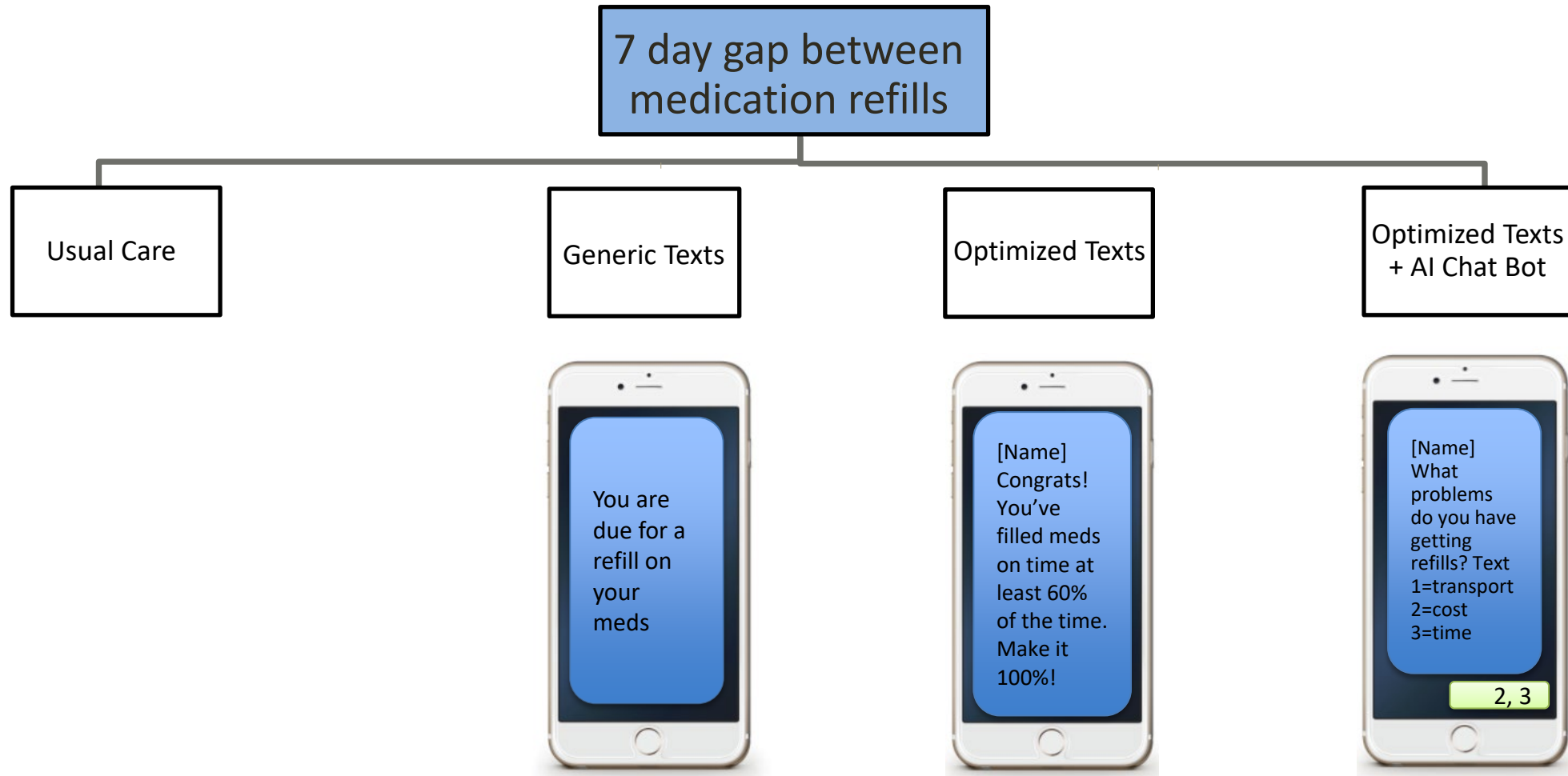
Condition	Classes of medications
Hypertension	Beta-blockers (B-blockers), Calcium Channel Blocker (CCB), Angiotensin converting enzyme inhibitors (ACEi), Angiotensin Receptor Blockers (ARB), Thiazide diuretic
Hyperlipidemia	HMG CoA reductase inhibitor (Statins)
Diabetes	Alpha-glucosidase inhibitors, 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

- English or Spanish-speaking

Opt-out study design



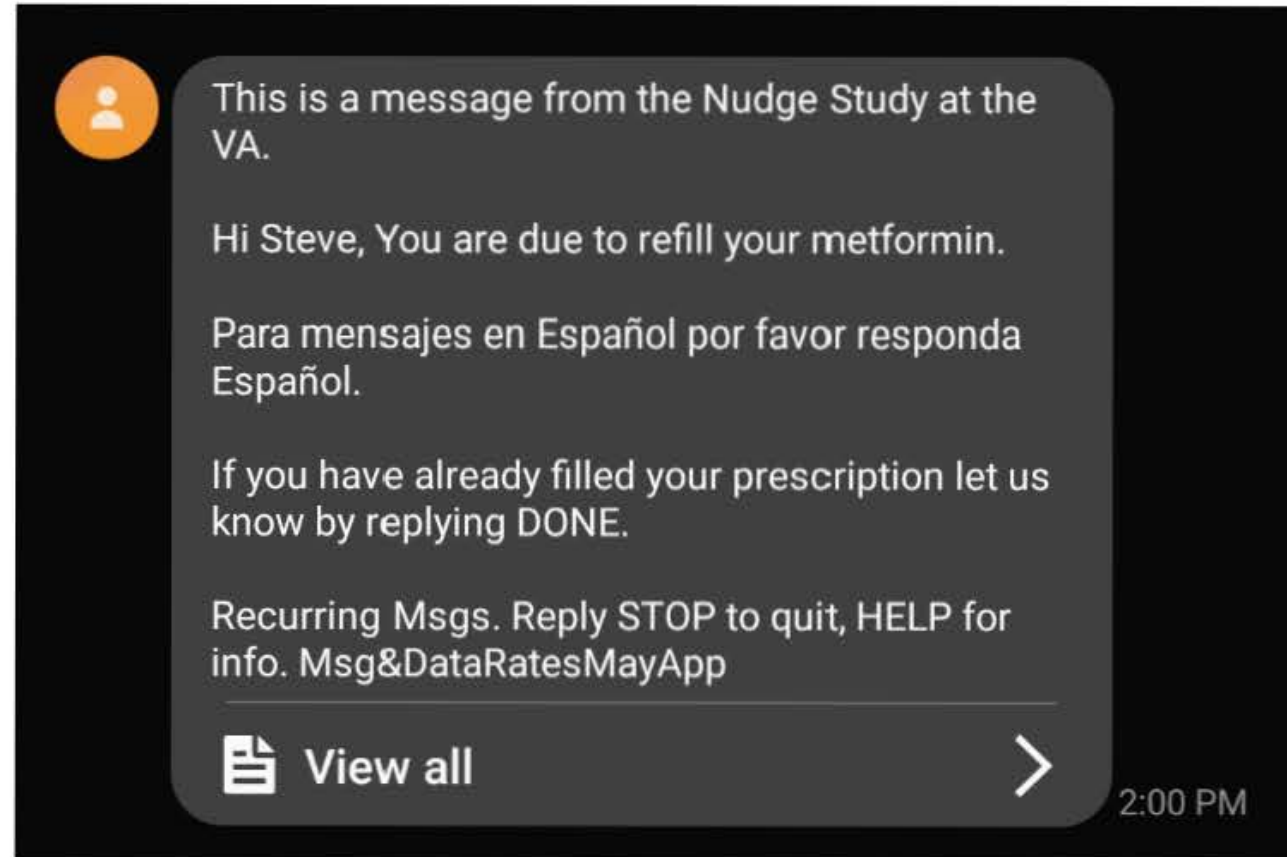
Intervention arms



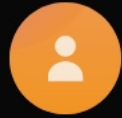
Types of nudges employed in this study

- Social Norms: Others like you are performing this behavior
 - Examples—testimonials *"People like Joseph have had success in remembering to pick up his meds by making it a habit to drive by his pharmacy on the way home from work"*
- Behavioral Commitments: Making a stated intention to take action
 - Example--*"Will you mention to a family member your intention to refill your medications today?"*
- Narrative stories: Evoking emotional connection
 - Example—*"Marta has committed to her daughter that she will stay on top of her refills so she'll be around longer for her grandkids!"*

Sample generic message



Sample optimized message



This is a message from the Nudge Study at Denver Health.

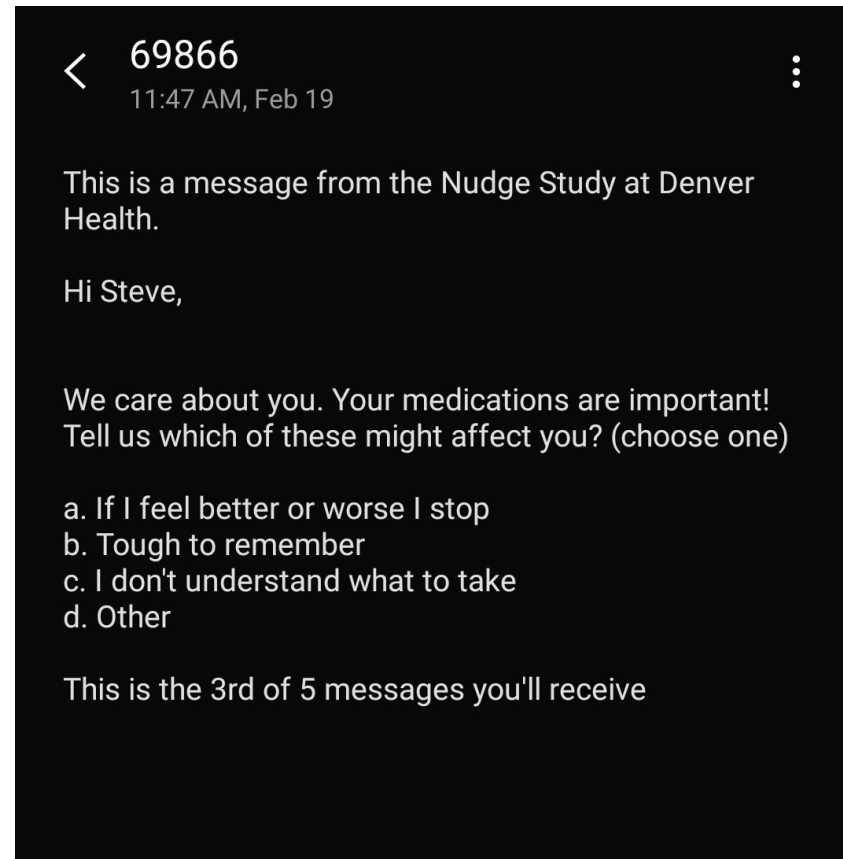
Hi Steve,

We noticed you haven't refilled your Metformin. Reply 1= I'll get them refilled in the next 2 days. Reply 2= I'm still working on a plan to get this done

This is the 1st of 5 messages you'll receive until you can refill

11:43 AM

Sample optimized + AI chatbot message



Potential Barriers

- Unable to confirm patient receipt of text messages and/or patient comprehension
- Possibility of switching numbers or losing cell service, particularly at the end of the month
- Growing burden of text messages in general
- Competing hospital/health system priorities
- Data integration (e.g., Surescripts pharmacy data)

Lessons Learned

- Stakeholder (i.e., patient, providers and health systems) engagement is critical
- Persistence and adaptability (particularly when COVID occurred) is key
- Creating multi-disciplinary and engaged teams to solve study issues