Key questions defining research program:

1) Impact of nitrite to mediate fatigability, aerobic function, and strength (with focus on central physiology and skeletal muscle) in older patients with heart failure (HFrEF and HFP EF).

2) To clarify the best exercise regimen to modify symptoms and improve physical function in older heart failure patients (aerobic, strength, inspiratory muscle training in relation to gene expression and functional attributes).

3) The mechanisms (central, peripheral, muscle transcription, and mitochondrial bioenergetics) by which exercise brings about therapeutic benefit in older heart failure patients.

4) Impact of different a multidimensional cardiac rehab program (exercise, behavior, diet) on outcomes in frail elderly CVD patients.

5) How to assess frailty as part of cardiac rehabilitation and CVD management.

Key words describing research program

1) Ageing–Frailty
2) Physical function- VO2, fatigability, muscle strength
3) Heart failure-Cardiac disease
4) Translational
5) Nitrite

Titles for shovel-ready research projects

1) Impact of nitrite therapy in HF.
2) Impact of frailty management of older CVD patients eligible for Cardiac Rehabilitation
3) Comparison of home-based cardiac rehabilitation to site-based cardiac rehabilitation. Relative benefits and process of hybrid cardiac rehabilitation strategies.
4) Transitions of care between hospital-based to home-based CVD management in older frail adults (safety, adherence, efficacy)

Data sources for shovel-ready research projects

1) Research study: Utility of Oral Nitrate Therapy to Improve Skeletal Muscle Bioenergetics and Physical Capacity in Old HF Patients
2) Cardiac Rehabilitation outcomes data at VA Pittsburgh Healthcare System
3) Prehabilitation for CVD patients