

# TARGETED RESEARCH TRAINING

Overall Goal: Interdisciplinary research training in the frameworks of one common theme.

Past 5 years: assess and control firefighters' cardiovascular risk factors

Next 5 years: assessment and control of cumulative health and safety risks among home healthcare workers



# Benefits to students

- Funds for PhD stipends (also for non-ERC students)
- Funds for supplies, local travel, and conference travel.
- Gaining experience in working in interdisciplinary research project using innovative new technology.
- Mentoring from faculty from other ERC disciplines.
- PhD thesis project, MS thesis, summer internship, special topics, independent research, or capstone project.

# Firefighter study in local news:

- <http://www.wlwt.com/article/uc-study-hopes-to-help-save-firefighters-lives/3526861>

Two PhD students currently finishing their thesis research  
Continues as faculty-supported research (Drs. Freeman and Grinshpun)



# Why home health care workers?

- Health care is primary employer in our region
- Home health care is fastest growing public sector industry.
- Work-related risk factors include multiple exposures, but comprehensive evaluation of multitude of exposures is missing.

# Specific Aims

- **Specific Aim 1:** Quantify the multitude of home healthcare workers' exposures, including ergonomics and safety
- **Specific Aim 2:** Apply emerging technologies for assessing and controlling home health care workers' exposures to aerosol and chemical hazards



# Specific Aim 1

P.I. Dr. Kermit Davis

Co-PIs: Dr. Gillespie, Dr. Huston

- **Sub-Aim 1:** Interview HHCW about exposures to Health & Safety risk factors
  - Nurses, nursing aides, therapists
  - Child, adult, elderly, and hospice
- **Sub-Aim 2:** Observe homes where HHCW work to verify exposures
- **Sub-Aim 3:** Conduct quantitative biomechanical evaluations of tasks in a home healthcare simulation facility
  - HHCW perform tasks in control environment
  - Interaction between stressors

## Specific Aim 2:

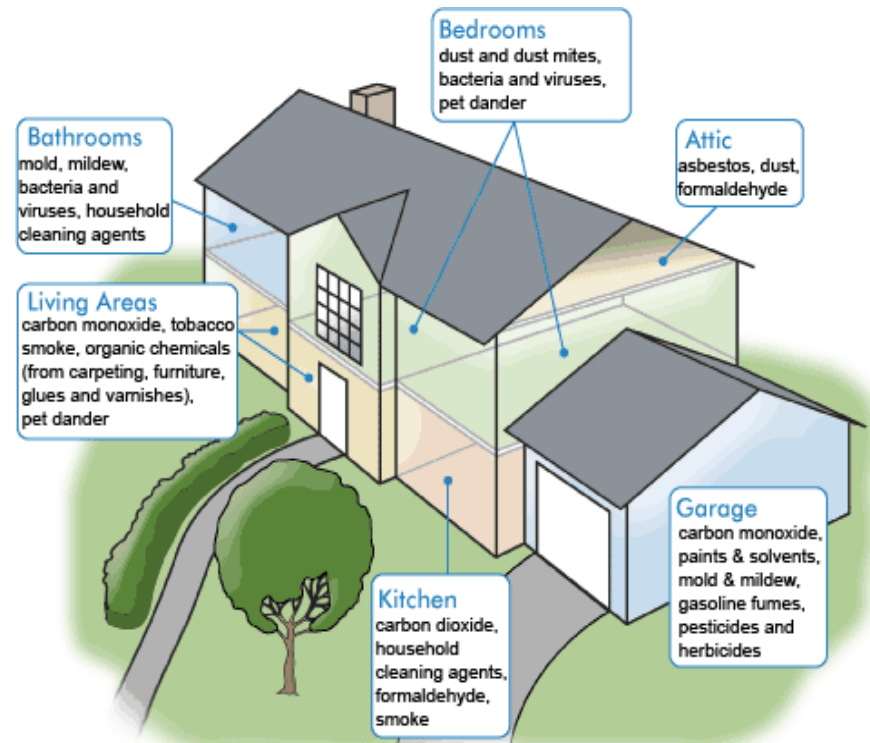
Apply emerging technologies for assessing and controlling home health care workers' exposures to aerosol and chemical hazards

- Aerosols: Dr. Grinshpun (PI), Newman (Co-PI)
- Chemicals: Dr. Maier (PI), Reutman (Co-PI)



# Aim 2: Background

- Home-attending health-care workers often enter the homes environments unprotected.

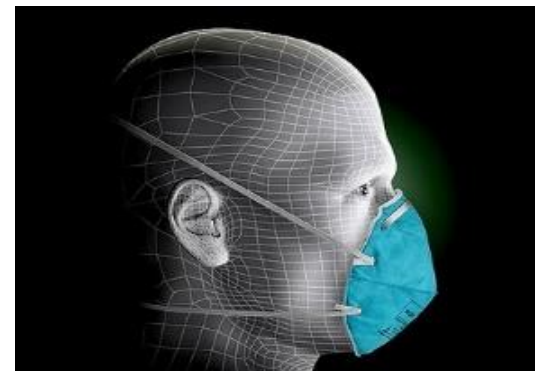


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# Aim 2: Background (cont'd)

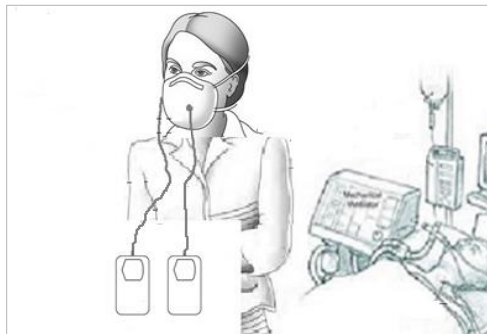
- Some health-care workers use surgical masks or NIOSH-certified N95 facepiece filtering respirators (FFRs).
- There are no specific recommendations or guidelines with respect to respiratory protection devices that should be used during home visits.



# Aerosol Hazards

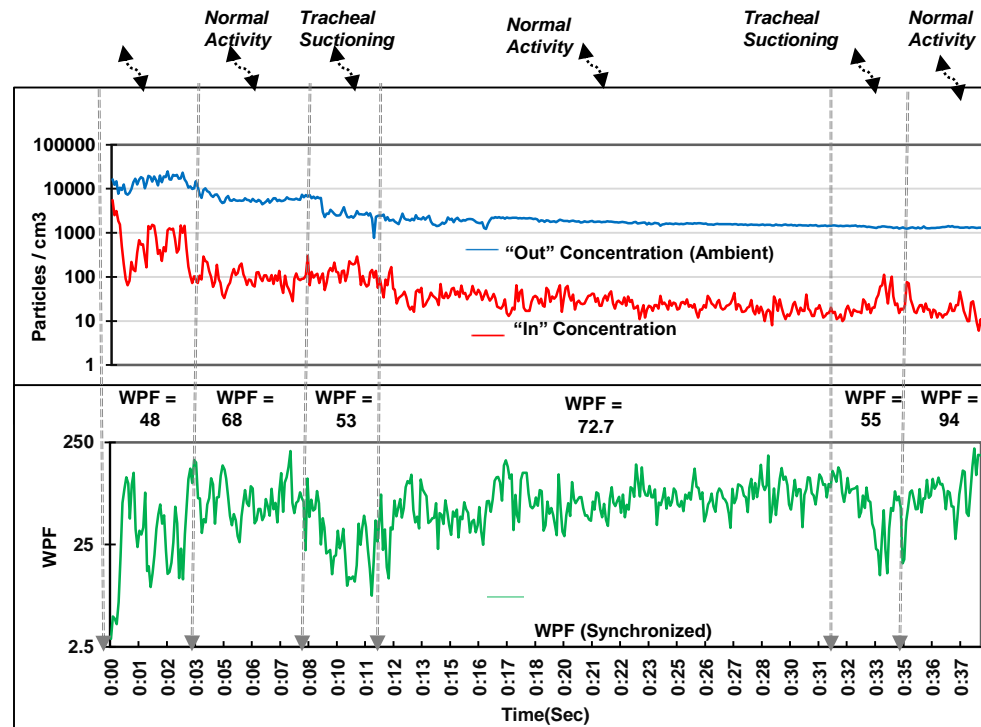
Dr. Grinshpun (PI), Newman (Co-PI)

- Studies are needed to assess relevant exposures to aerosol hazards
- Efficiency of respiratory protection devices needs to be characterized



# Pilot data

(from Yosef Elmashae's PhD thesis)



# Chemical Exposures

Dr. Maier (PI), Reutman (Co-PI)

- HHCW can have significant exposures that merit further evaluation:
  - Hazardous drugs and pharmaceuticals
  - General indoor air contaminants
  - Cleaning agent exposures
- These exposures are of special interest because HHCWs have higher cumulative doses than residents since they visit many homes.

# Risk Modeling

- The exposure data will be used to develop a risk model that will support education.
- Key issues:
  - What is the interaction among stressors? E.g., does the method of patient handling affect drug exposure? How does cleaning effect bioaerosol exposure?
  - Relative attribution of risk – what chemical sources, exposure routes, and tasks are generating the greatest risk?