University of Connecticut Study on Aging, Musculoskeletal Disorders and Work Capacity (UConn-SAM)

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UConn-SAM
2017: Long Term Goal & Specific Aims

- **Long-Term Goal**: Design interventions to improve physical health and quality of life of Connecticut’s workforce as it ages.

- **Aim 1**: Reassess a longitudinal cohort of manufacturing sector workers who had been evaluated in 2008-2014 using physical performance tests and survey research methods.

- **Aim 2**: Improve capacity to measure and test physical health in the workplace and throughout the day.

- **Aim 3**: Develop and implement pilot interventions in the workplace to create a more age-friendly workplace.
Health problems of the bones, joints and muscles can be related to job demand and design, and to individual factors, such as age, gender, exercise, obesity and diet. These factors combine to affect the ability of workers to do their jobs.

2008-2014 project was designed to understand these issues and to identify steps that can be done both at work and personally to function well in middle age and later years.
Specific Aims of 2008-2014 Project

• Evaluate the effects of **workplace exposure** (including physical, psychosocial and organizational factors) on the **normal, age-related changes in the health of the musculoskeletal system (MSH)**.

• Evaluate the effects of **work-family balance, non-work factors, and personal factors** (such as health attitudes and leisure exercise) on the normal, age-related changes in MSH.

• Evaluate how workplace exposures and non-work influences differ between men and women engaged in similar employment, and how these **gender-specific patterns of risk** differentially affect the normal, age-related MSH changes in men and in women.

• Identify **factors that best predict higher or lower than normal rates of disability with aging**.
<table>
<thead>
<tr>
<th><strong>Study Design</strong></th>
<th>Longitudinal cohort study with replacement at 6 Connecticut manufacturing sites</th>
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</thead>
<tbody>
<tr>
<td><strong>Study Measures</strong></td>
<td>Personal, organizational, and health and retirement surveys; physiologic and performance testing; administrative and qualitative data; ergonomic analyses</td>
</tr>
<tr>
<td><strong>Recruitment Goal</strong></td>
<td>1200-1400 at inception/700 at conclusion</td>
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</tbody>
</table>
Participants and Timeline

- TIME 1: 2009
- TIME 2: 2011
- TIME 3: 2013
- TIME 4: 2016-2017

- New Participants
- Total Participants (Physical Testing)
- Left Employment

- Text in RED = projected numbers

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Characteristics of Participants

- 65% of workforce is ≥ 45 years old
- 20% of workforce is ≥ 60 years old
- Age: mean 48.9 ± 10.4 years
- Tenure: mean 15.2 ± 12.3 years
- 63% are production workers
- 70% male and 30% female
Three Types of Data Collection

- Survey measures
- Physical tests
- Exposure Measures
TIME 1 ~1.6 years ➔ TIME 2 ~1.2 years ➔ TIME 3

Demographics
Home/Personal Demands
Subjective Health
Clinical Health
Job Demands
Psychosocial/Workplace Perceptions
Job Perceptions/Attitudes

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Demographics
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### TIME 1

#### Demographics
- Job characteristics
- Personal characteristics
- Care responsibilities

#### Subjective Health
- Physical, Functional, Mental, General
- Sleep
- Readiness to Improve

#### Clinically Assessed Health
- Physical, Functional

#### Job Demands
- Working Conditions
- Ergonomics
- Work-Safety Tension
- Job Content (skill discretion, psychological, decision authority)
- Scheduling
- Physical Demands

#### Psychosocial/Workplace Perceptions
- Support (Supervisor, Coworker, Organization)
- Justice
- Civility
- Work Experience

#### Job Perceptions/Attitudes
- Job Insecurity
- Job Satisfaction
- Turnover Intention
- Stress
- Mastery/Control
- Burnout/Exhaustion/Disengagement
- Performance Evaluations
- Work-Family Conflict

### TIME 2

#### Demographics
- Job characteristics
- Personal characteristics
- Care responsibilities

#### Subjective Health
- Physical, Functional, Mental, General
- Sleep

#### Clinically Assessed Health
- Physical, Functional

#### Job Demands
- Working Conditions
- Ergonomics
- Work-Safety Tension
- Job Content (skill discretion, psychological, decision authority)
- Scheduling
- Physical Demands

#### Psychosocial/Workplace Perceptions
- Support (Supervisor, Coworker, Organization)
- Justice
- Civility
- Work Experience

#### Job Perceptions/Attitudes
- Job Insecurity
- Job Satisfaction
- Turnover Intention
- Stress
- Mastery/Control
- Burnout/Exhaustion/Disengagement
- Performance Evaluations
- Work-Family Conflict

### TIME 3

#### Demographics
- Job characteristics
- Personal characteristics
- Care responsibilities
- Retirement Considerations

#### Subjective Health
- Physical, Functional, Mental, General
- Sleep

#### Clinically Assessed Health
- Physical, Functional

#### Job Demands
- Working Conditions
- Ergonomics
- Work-Safety Tension
- Job Content (skill discretion, psychological, decision authority)
- Scheduling
- Physical Demands

#### Psychosocial/Workplace Perceptions
- Support (Supervisor, Coworker, Organization)
- Justice
- Civility
- Work Experience

#### Job Perceptions/Attitudes
- Job Insecurity
- Job Satisfaction
- Turnover Intention
- Stress
- Mastery/Control
- Burnout/Exhaustion/Disengagement
- Performance Evaluations
- Work-Family Conflict
Physical Tests

- Body Mass Index
- % Body fat
- Waist circumference
- Blood pressure, hypertension
- Flexibility: lumbar, cervical range of motion
- Grip strength
- Ergometer measures - energy and power
- Leg press: leg power and strength
- Cybex: trunk, knee and shoulder torque, fatigue

Exposure Measures

- Time Window Analysis
- Real time Electrogoniometry
- Actigraphy
Changes in Workforce Perceptions of Job Demands

Time 1  2008-2009
Time 2  2011
Time 3  2011-2013
## Expected and Unexpected Findings: 2004-2014

<table>
<thead>
<tr>
<th>Study Expectation</th>
<th>Effects of work and non-work factors on musculoskeletal health and biological aging</th>
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<tbody>
<tr>
<td><strong>Unexpected Findings</strong></td>
<td></td>
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<tr>
<td>• workers not leaving employment</td>
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<td>• economic concerns affecting expected retirement</td>
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<tr>
<td>• dramatic and persistent decline in psychosocial measures, including stress and economic security</td>
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<tr>
<td>• eldercare responsibilities are larger than anticipated, with physical and psychological consequences</td>
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</table>
Lessons Learned: Testing

- Survey

- Physical measurements

- Instrumented exposure monitoring

Where we needed more data
- Eldercare and Home Care
- Financial security
- Plans for 7th decade and beyond

Where we needed more data
- Endurance
- Exercise testing
Future Research Prerogatives

• Aging work force and retirement study focused on specific cohorts in contrast to populations
• Interventions based on current findings: eldercare assistance, retirement counseling, age accommodation

Unanswered Questions

• Do plant level (cohort) effects continue into late working life and retirement
• Will the future health of Connecticut middle income workers reflect psychosocial factors
• What is the relationship between short-term and long-term effects on health
• What is the stability of behavioral and organizational indicators
Reassembling the Time 3 cohort for continued assessment
Extended items on economic security and work-family responsibilities.
Alternate approaches to physiologic testing will be taken in the laboratory and applied to the field, if useful.
Develop extended approaches to retention.
Conduct laboratory evaluations on alternative 24/7 assessment, utilizing the findings of the European DPHACTO study
  • Work with the Area Committees on Aging is underway to design workplace interventions on Eldercare.
  • Other pilot interventions include quantitative recommendations on the age friendly workplace.
Contacts & Acknowledgements

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