Community Mobility Barriers Predict the Development of 30-Month Disability: The MOST Study

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What is the Environment's Impact on Disability?

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Disability Defined: Limitation in Personal and Social Role Behaviors

(Nagi 1966, 1976, 1991)

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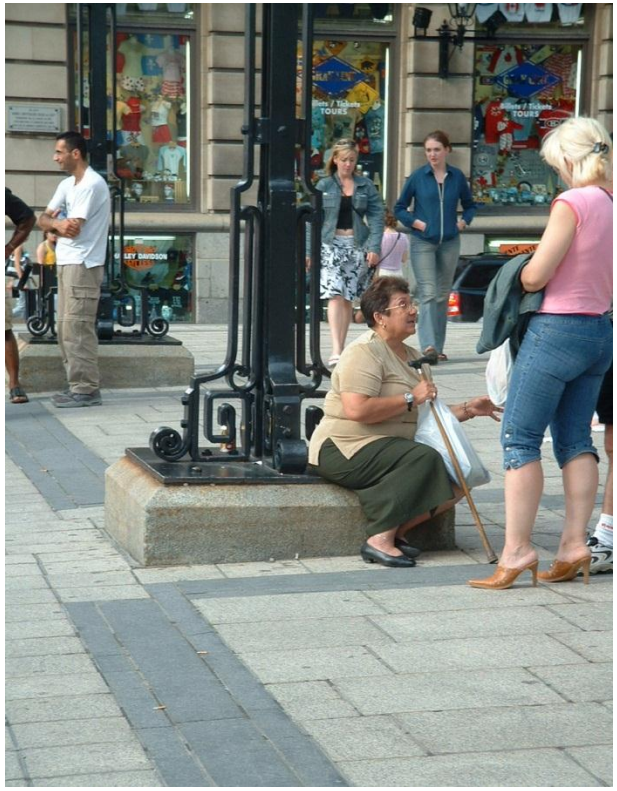
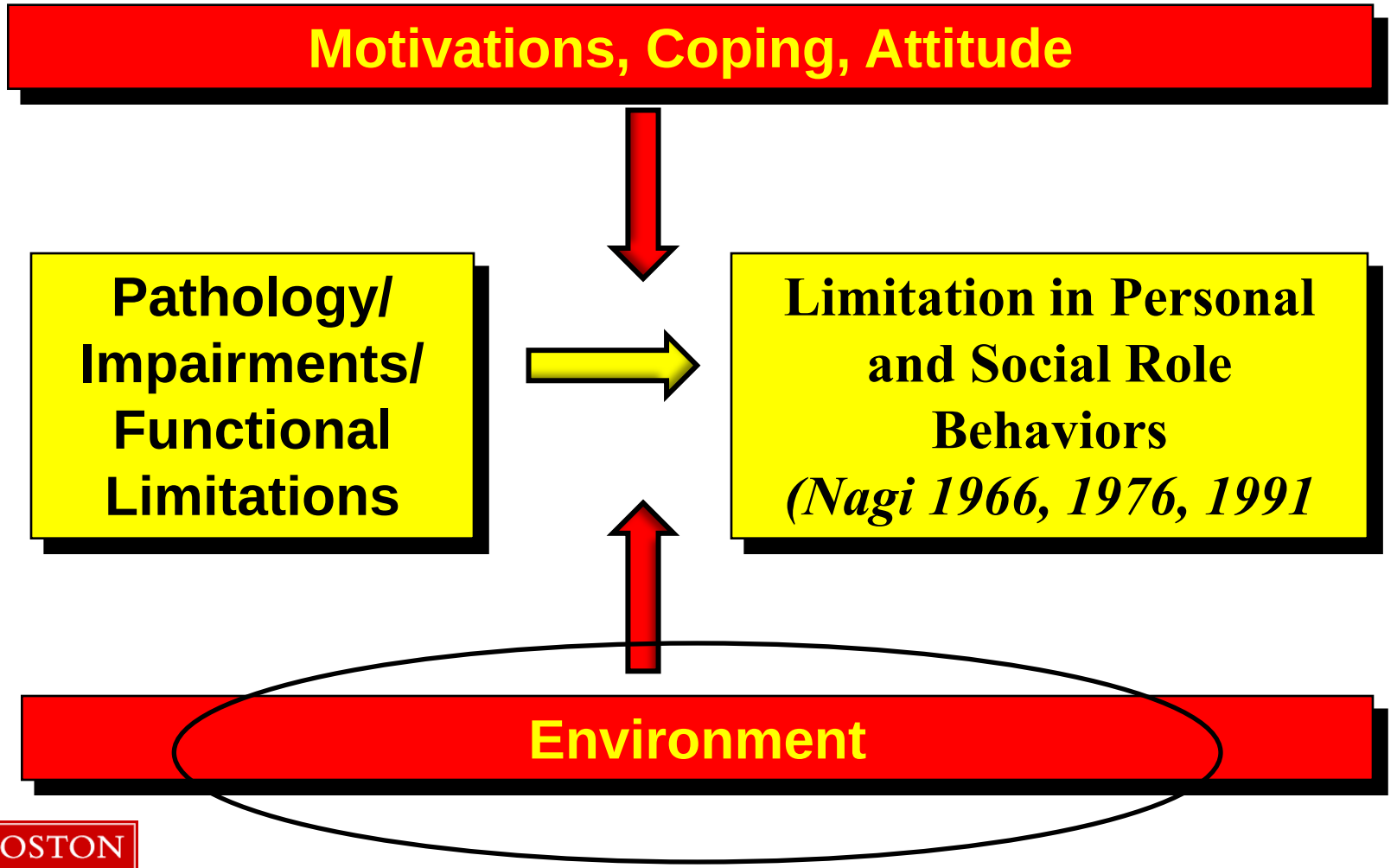
Theory: Disability results from the interaction of the person within their environment.

Institute of Medicine, 1991 & 1997



Determinants of Disability



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Barriers (built environment, social attitudes) and ***Facilitators*** (attitude, support, products, tools, assistive devices, and accessible transportation) **are** Present

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Gray et al. ; Noreau et al., 2002; Meyers et al., 2002; Shumway-Cook et al., 2002; Shumway-Cook et al., 2003

Community Mobility Barriers Reported by Older Adults in Birmingham, Alabama and Iowa

	% Barrier Present
Community Mobility Barrier Items	
Uneven sidewalks or other walking areas	79
No parks and walking areas that are easy to get to and easy to use	12
No safe parks or walking areas	12
No places to sit and rest at bus stops, in parks, or in other places where people walk	21
No curbs with curb cuts	20

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Keysor et al. 2010

Community Transportation Facilitators Reported by Older Adults in Birmingham, Alabama and Iowa

Transportation Facilitators	% Facilitator Present
Public transportation that is close to your home	58
Public transportation with adaptations for people who are limited in their daily activities	93
Handicap parking	45

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Keysor et al. 2010

Environmental Features Associated with Disability

- In adults with knee pain and/or functional limitations
  - Wilkie et al, 2007; Keysor et al. 2010, Clarke et al. 2005; Clarke et al. 2008
- In rehabilitation populations
  - Keysor et al. 2005; Whiteneck et al. 2004; Rochette et al. 2001
- No longitudinal studies

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Purpose

- To examine whether mobility-related factors in the community environment were associated with the **development of 30-month disability** among older adults with functional limitations.

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Research Hypotheses

1. Persons without disability at baseline who live in environments with more barriers will be more likely to develop incident disability at 30-months

2. Persons without disability at baseline who live in environments with more facilitators will be less likely to develop incident disability at 30-months

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Methods: Recruitment Parent Study (MOST)

- Participants recruited from the Multicenter Osteoarthritis (MOST) Study
  - Prospective cohort study of community-dwelling adults age 50+ (N=3026)
  - Participants from Birmingham, Alabama and Iowa City, Iowa

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Methods: Recruitment Ancillary Study

- MOST-Knee Pain and Disability (MOST-KPAD) Ancillary Study
  - Eligibility: Enrolled in MOST, age 65 or older, functionally limited (N=443)
  - Phone survey within 30 days of MOST clinic visit at baseline

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Methods: Data

- Community mobility barriers and transportation facilitators (Home and Community Environment Scale (HACE))
  - MOST-KPAD baseline interview
- Disability: Late Life Disability Instrument-Instrumental Limitation Subscale
  - Baseline and 30-month follow-up
- Function (gait speed), pain, age, race, sex, education, body mass index, depressive symptoms, and clinic site
  - Baseline MOST clinic visit

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Community Mobility Barriers and Transportation Facilitators (HACE)

To what extent does your local community have....

1. A lot or some uneven sidewalks or other walking areas
2. No parks & walking areas
3. No curbs with curb cuts
4. A lot or some public transportation that is close to your home
5. A lot or some handicap parking

Responses summed and dichotomized: Low vs. High Barriers
Low vs. High Facilitators

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Keysor, Jette, & Haley (2005)

Outcome: Late-Life Disability Instrument (LLDI): Instrumental Limitations

(Scale 12 items; weighted score 0-100)

To what extent do you feel limited in. . .	***Not at all***	***A little***	***Somewhat***	***A lot***	***Completely***
Going out with others to public places	5	4	3	2	1
Taking care of local errands	5	4	3	2	1

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Jette et al. (2001). Journals of Gerontology: Medical Science

Disability: Outcome Variable

- LLDI Cut-points previously established for no, mild, moderate, and severe disability
  - Jette AM, Haley SM, Kooyoomjian 2002

  - Score >= 67.6 No/Mild Disability= No Disability
  - Score < 67.6 Moderate/Severe Disability=Disability

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Methods: Analyses

- Selected participants without disability at baseline
- Calculated the number of people who developed disability at 30-months
- Logistic regression
- Adjusted for age, sex, education, race, body mass index, knee pain, depressive symptoms, gait speed, and clinic site
- Sensitivity analyses to examine cut-point

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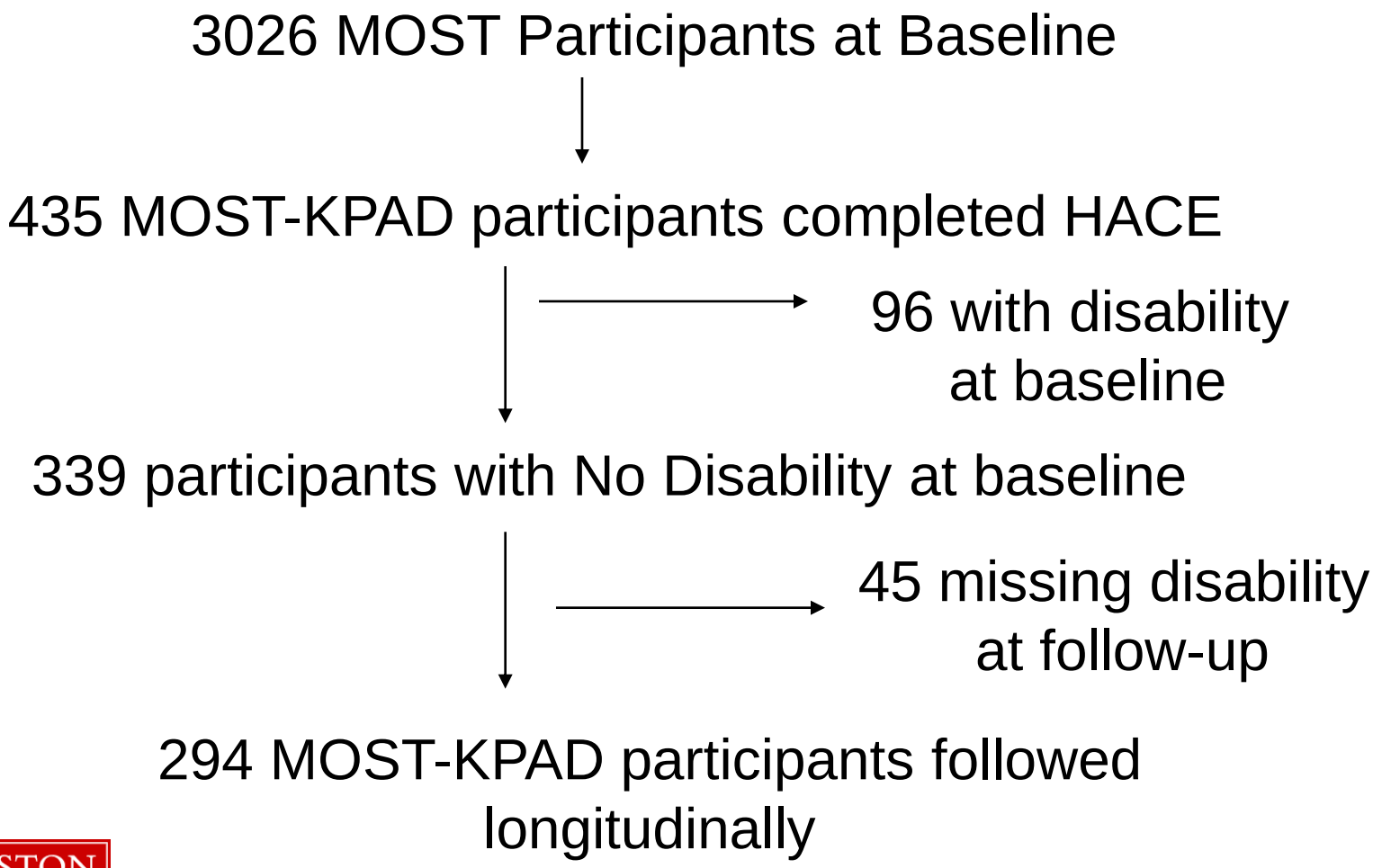
Sample



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Results: Descriptive Statistics (N=294)

	Mean (SD)
Age (Years)	70.3 (4)
Gender (% Female)	69%
Race (% White)	94%
Education (% High school)	32%
Knee Pain Visual Analogue Scale (range 0-98)	28 (20)
Function: Gait Speed m/sec (range: 0.6-1.6)	1.2 (0.2)

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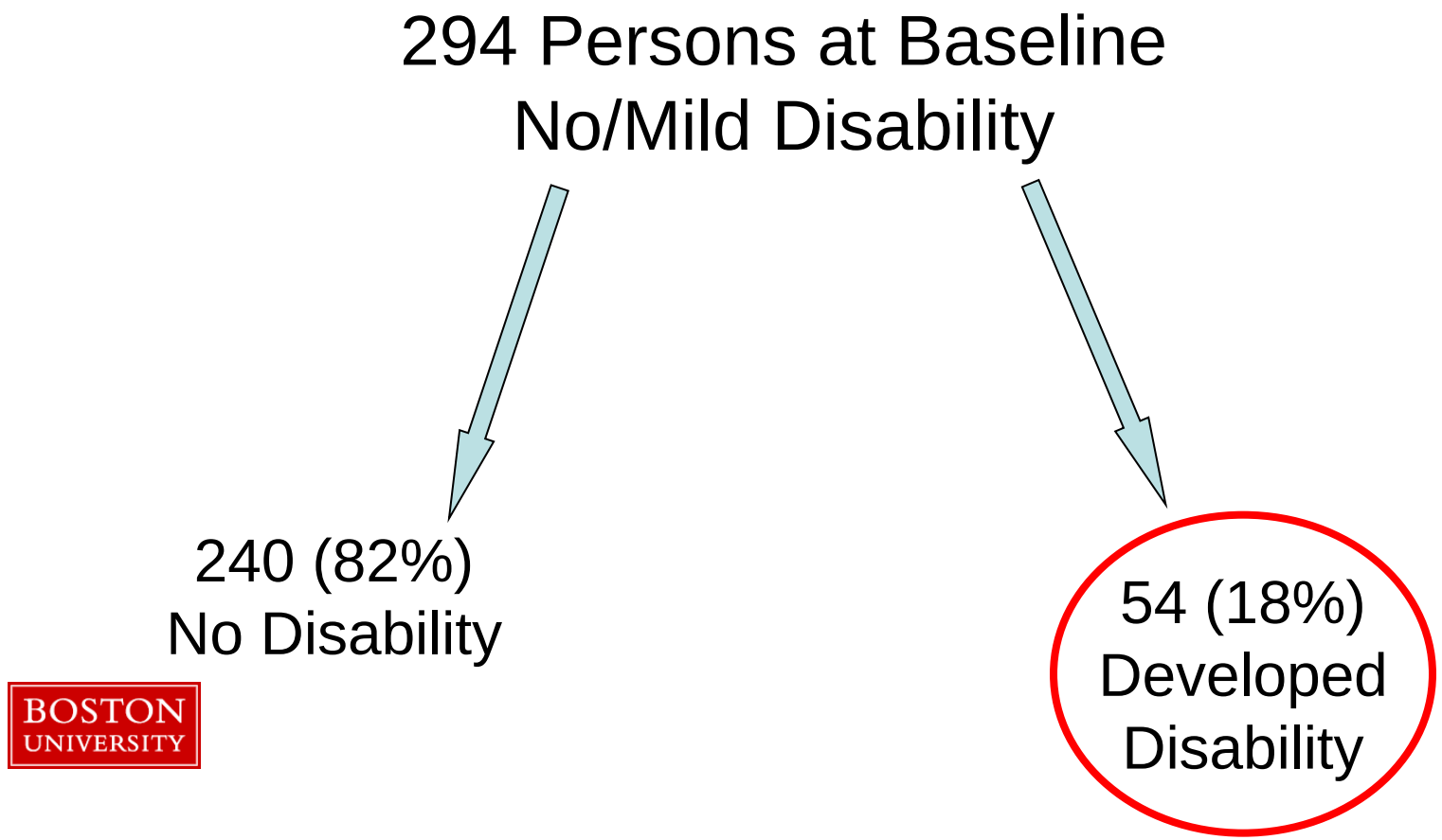
Results: Persons Developing Disability at 30-Month Follow-up



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Results: Odds of Developing 30-Month Disability by Community Mobility Barriers *

	Subjects Developing Incident Disability N (%)	Crude OR (95% CI)	Adjusted OR* (95% CI)
Low Mobility Barriers	33/215 (15)	1.0	1.0
High Mobility Barriers	21/79 (27)	1.9 (1.1-3.7)	1.6 (0.8, 3.2)

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* Adjusted age, sex, race, education, body mass index, knee pain, walking speed, depressive symptoms and site

Results: Odds of Developing 30-Month Disability by Transportation Facilitators

	Subjects Developing Incident Disability N (%)	Crude OR (95% CI)	Adjusted OR* (95% CI)
Low Transportation Facilitators	23/109 (21)	1.0	1.0
High Transportation Facilitators	31/185 (17)	0.8 (0.4-1.4)	0.8 (0.4-1.6)

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* Adjusted age, sex, race, education, body mass index, knee pain, walking speed, and site

Sensitivity Analysis: LLDI-IL Cutpoint 65.47 (Lowest Quartile)

	Subjects Developing Incident Disability N (%)	Crude OR (95% CI)	Adjusted OR* (95% CI)
Low Mobility Barriers	27/219 (12)	1.0	1.0
High Mobility Barriers	23/83 (28)	2.5 (1.5-5.1)	2.4 (1.2, 4.6)

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* Adjusted age, sex, race, education, body mass index, knee pain, walking speed, and site

Conclusion

- Environments with more mobility barriers do seem to be a risk factor for incident disability

- Transportation facilitators seem to have a modest but not significant association with incident disability

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Limitations

- Limited power to detect the relationships
- Did not adjust fully for other socioeconomical or psychological variables
  - Cannot completely rule out causality by other factors

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Clinical Implications

- Community mobility barriers (and facilitators) are present and seem to have an important role in the development of disability (restricted participation/activity limitation)
- Need to discuss environment with our patients as a means to foster enhanced participation
- More research…policy change

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MOST Data and Image Sets Available to the Scientific Community

- MOST Online description of data available: http://most.ucsf.edu
- Steps to obtaining MOST data: http://most.ucsf.edu/steps.asp
- Information or questions on how to request data: MOSTOnline@psg.ucsf.edu
- Collaboration with MOST investigators: http://most.ucsf.edu/contact.asp

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