New Images of Memory and the Aging Brain:
Challenges and Prospects in Treatment and Research for Alzheimer’s and Brain Injury

James Brewer, M.D., Ph.D.

Professor, Neurologist,
Depts of Radiology and Neurosciences
Director, Human Memory Laboratory, Imaging Core ADCS
Interim Director, Shiley Marcos Alzheimer’s Disease Research Center
UC San Diego
Memory and The Seahorse (Hippocampus)
Hippocampus
Hippocampus
Alzheimer’s Effects on Memory are via the Hippocampus
Brain Imaging can detect these changes
Atrophy over just 6-months
Atrophy over just 6-months
Fully-Automated Volumetric MRI

Healthy Brain
Fully-Automated Volumetric MRI

Alzheimer’s Brain
Translating to Clinical Practice

Integrating into clinical workflow

Disease Markers Reveal Earliest Phases of the Disease

- Protein Deposition
- Atrophy
- Memory

~10 years

Clinical Disease Stage

Abnormal

Normal

Preclinical

MCI

Dementia
UCSD PET imaging of AD Protein Abnormality in Down Syndrome
Fusion of PET with Segmented MRI
Better Phenotyping through Quantitative Radiology

- Quantitative assessment of underlying pathology
- Quantitative assessment of neurodegeneration
- Better understanding of disease processes
- More efficient assessment of therapies in the most highly characterized cohorts