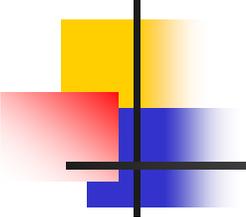


# Memory Loss

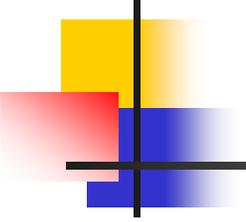
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# An Aging Population

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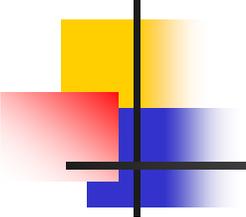
- There are 77 million people in the baby boomer generation
- In 10 years all of the baby boomers will be 50 or older
- As many as 25% may develop some form of dementia
- By 2050 the population of people over 65 will double to 70 million
- 13.2 million of these people will have Alzheimer's disease



# The Decline of Cognitive Function

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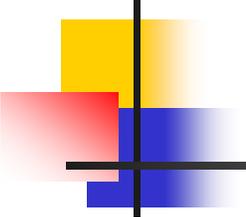
- The brain reaches its maximum weight by age 20
  - Slowly starts shrinking as we age
  - The brain will lose 10% of its volume over an average lifetime
- 75% of people over 50 believe that they suffered memory problems over the past year
- At least 20 million Americans over 60 have some degree of cognitive impairment



# Alzheimer's Disease

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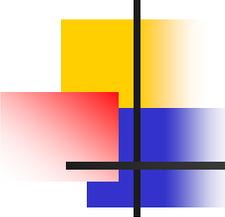
- Alzheimer's disease is a progressive neurological disease that destroys memory and cognitive function over time
- The disease eventually leaves its victims helpless
- Alzheimer's is the #1 cause of institutionalization in the U.S.
- 4.5 million Americans over 60 have Alzheimer's.
- 50% of people over age 85 and over end up with Alzheimer's
- There is no way to predict who is at risk for dementia
- Alzheimer's cannot be diagnosed with certainty until after a patient's death.
  - It is diagnosed by plaque buildup in the brain found during an autopsy
  - The plaque forms by a buildup of the protein amyloid, which begins to slowly destroy neurons in the brain



# The Race for the Magic Pill

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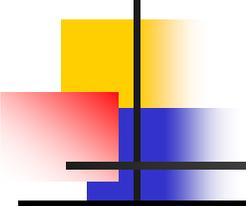
- Current Alzheimer's treatments are considered an "act of despair"
- Despite their limitations, the three Alzheimer's drugs currently on the market grossed more than \$1 billion
- Scientists now have a greater understanding of the process of memory formation due to imaging technologies, animal experimentation, and genetics



# The Race for the Magic Pill (2)

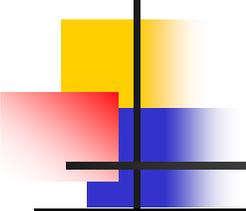
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- The cost of caring for Alzheimer's patients was over \$100 billion in 2003
- A pill that could delay the decline into Alzheimer's is a necessity to cut healthcare costs
- The invention of this pill would also bring billions of dollars in profit to the inventor.
- More than 60 pharmaceutical and biotech companies are working on memory pills
- 40 are in human trials, and some could be on the market in the next few years



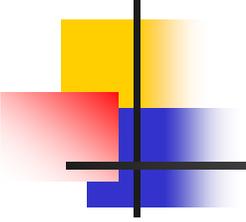
# In the Pipeline

<b>Drug</b>	<b>Manufacturer</b>	<b>Notes</b>
CX516	Cortex Pharmaceutical	Designed for people with short term memory loss for mild cognitive impairment. Ampakines amplify neurotransmitters which stimulate the production of more synapses
Memantine	Merz/Forest Labs	Designed for people with Alzheimers. Targets the cell receptor that controls the intake of glutamate. When used, patients were able to remain living independently for 6 months to 1 year longer than those in the placebo group
SGS742	Saegis Pharmaceuticals	Blocks gaba which inhibits memory consolidation
MEM1414	Memory Pharmaceuticals	Inhibits an enzyme which breaks down cyclic-AMP. C-AMP plays a role in strengthening synapses. C-AMP activates the protein CREB which switches on genes that control the release of neurotransmitters essential to long term memory



## In the Pipeline (2)

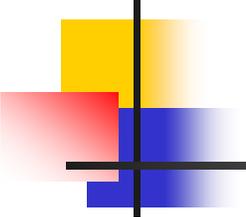
<b>Drug</b>	<b>Manufacturer</b>	<b>Notes</b>
Reminyl Exelon Aricept	Johnson & Johnson Novartis Pfizer	Designed for Alzheimers. Inhibits an enzyme that breaks down acetylcholine, a chemical linked to memory. Can delay the downward trajectory in the early stages of mild cognitive impairment. Can cause nausea and loss of appetite. All three drugs are currently on the market, but do not improve thinking power.
Aspirin		Being investigated for its anti-inflammatory effects relative to Alzheimers
Statins		Being investigated for their ability to decrease plaque buildup. It is hoped that statins will work in the brain to decrease the rock-hard plaque that destroys neurons and leads to Alzheimers



# Other Potential Remedies

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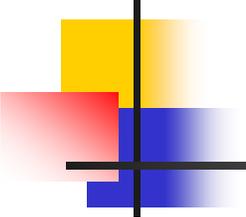
- Vitamin E may protect brain cells from free radical damage
- Estrogen
- Blood pressure medications
- Cholesterol lowering medications



# Other Potential Remedies

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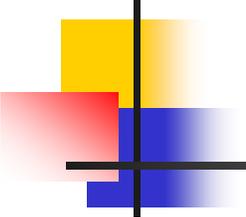
- Special diets:
  - Curry
  - India has the lowest incidence of Alzheimer's in the world
- Memory exercises
  - A study followed 469 people age 75 or older for 5 years
  - Those in the top 1/3 of mental activity had a 63% lower risk of Alzheimer's than those in the bottom 1/3
  - Taking part in a single mental activity one day a week reduced the risk for dementia by 7%



# Other Markets for Memory Pills

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- Mild Cognitive Impairment which is suffered by 8 million people in the U.S over 50.
- Age-associated Memory Impairment
  - Signs of condition include misplacing keys and failure to recall a well-known name
  - 12 million Americans suffer from these lapses
- College students
  - Help to improve test scores
  - Evidence suggests that even sharp memories can be improved
- FDA regulations for mild cognitive impairment memory drugs will be strict in regards to the safety of the drug
  - Memory pills would be taken by millions of otherwise healthy people
  - Many experimental brain drugs have failed in clinical trials because of disastrous side effects



# The Future of Memory Loss

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- Billions of dollars are being spent by the pharmaceutical industry to find an effective treatment of memory loss
- It is expected that in the next 5 years treatments will be available that delay the decline of Alzheimer's by 5 years or more