

# Health essays - alzheimer dementia disease essay



**ASSIGN  
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## Alzheimer Dementia

Closing in on Alzheimer's

*“ Soon, Alzheimer's disease will touch everyone in this country in some form or another, so the need to redouble our research efforts greater than ever before. We must have better treatments, earlier detection, and effective strategies to prevent Alzheimer's. Scientists have made tremendous strides in the last two decades, but the clock is ticking.”* -Samuel Gandy, MD, PhD, chair of the Alzheimer's Association's Medical and Scientific Advisory Council.

*There is no cure, but there is hope, for the world's most leading cause of dementia - ALZHEIMERS .*

- “ AD” is a neurodegenerative disorder, the underlying cause still being unknown.

The clinical features or the underlying pathology can only be discovered on autopsy and thus the signs and indications of AD are instigated only after years of accretion of the credible causes. Some of the signs include:-

- *Cognitive deterioration.*
- *Visual spatial confusion.*
- *Loss of recognition of persons and objects.*
- *Reduced mobility.*
- *Deterioration of muscles.*
- *Inability to feed oneself.*
- *Language disorientation.*

- The onus of the illness lies in the deposition of fibrillized plaques containing amyloid beta(AB).

The AB proposition shows potential for the reason that, as seen in patients with trisomy 21(downs syndrome), who have an additional copy of the gene for AB precursor, almost universally exhibit AD like indications prior to age 40.

These signs of AD can be accredited to the cytotoxic potential of the mature aggregated amyloid fibrils. Consequently, a great amount of the research work on lead breakthrough is focused on:-

- *Inhibition of fibrillization.*
- *Inhibition of AB precursor to AB.*

A different supposition understood to elicit the disease cascade, is centered on the effects of aggregated *tau proteins* . This speculation is sustained by the long standing observation that aggregation of AB plaques does not correlate with neuron loss.

Although a great deal is known a propos the disease prognosis, causative or risk factors, the acquaintance we encompass of, in the present day, concerning the fundamental pathological origin or the core cause of the disease is zilch. Nevertheless, ApoE4, the foremost genetic risk factor for AD has been allied with surplus of AB build-up.

The risk factors for AD are:-

- *Advancing age.*
- *Head injury.*

- *Aluminum intake.*
- *ApoE4.*
- *Poor CVS health.*
- *Smoking.*

AD is most often established based on clinical signs and symptoms, and the history of patient's infirmity, as a definitive diagnosis is only achievable by performing an autopsy. Common diagnostic tests include:-

- *Memory testing.*
- *Intellectual functioning.*
- *Neuropsychological screening tests.*
- *Blood tests to rule out presence of other diseases.*
- *Functional neuro-imaging techniques like SPECT ad PET.*
- Once diagnosed, on an average, survival is 7 - 10 years, the extremes being 4 years to 21 years.

Essentials, statistics and incidence of Alzheimer's:-

- *24 million people affected with AD worldwide.*
- *Slated to become 81 million by 2040.*
- *1 out of 8 people above the age of 65 have AD.*
- *Only 19% with AD have the diagnosis recorded in their medical records.*
- *7<sup>th</sup> leading cause of death in the United States.*

- *From 2000-2004, death rate due to AD has increased by 32.8%, while that of breast cancer, prostate cancer, stroke and heart disease has decreased by 2.6, 6.3, 10.4, 8% respectively.*
- *Costs of AD and other dementias amount to \$148 billion annually.*

*Current drugs in the global market for treatment of Alzheimer's:-*

[1]ARICEPT:

Key essentials about aricept:

- Was permitted for the treatment of mild to moderate Alzheimer's by the FDA in 1996, and for the treatment of severe Alzheimer's in 2006
- Is the #1 prescribed Alzheimer's drug—worldwide, more than 3.8 million people have been treated with Aricept.
- Aricept is a drug branded as a cholinesterase inhibitor. It is one of a group of prescriptions that appear to improve the cognitive ability (thinking, perception, judgment and recognition) in people with Alzheimer's disease.
- Aricept can reduce behavioral troubles that may be exhibited by people with this type of dementia.
- Known as a cholinesterase inhibitor, Aricept delays the breakdown of the neurotransmitter acetylcholine in the brain. Acetylcholine helps communication between the nerve cells and is vital for memory.
- Side effects are typically mild and tend to disappear as treatment progresses. Common side effects are nausea, vomiting, diarrhea,

fatigue, insomnia, muscle cramps. Less common effects are headaches and dizziness. Rare side effects are anorexia, gastric or duodenal ulcers, gastro-intestinal hemorrhage, bladder overflow obstruction, liver damage, convulsions, heart problems and psychiatric disturbances.

[2]EBIXA:

Ebixa fine points:

- Ebixa is one of a group of drugs called NMDA (n-methyl-D-aspartate) receptor antagonists. These receptors, along with the neurotransmitter glutamate, are implicated in transmitting nerve signals in the brain that may be imperative for learning and memory.
- Ebixa, which acts on NMDA receptors, facilitates to normalize transmission of nerve signals, and perhaps slow the decline of some indications of Alzheimer's disease.
- Ebixa is not a cure for Alzheimer's disease as it does not affect the fundamental degenerative progression of the disease.
- Ebixa may cause some unwelcome reactions. These may include fatigue, dizziness, sleepiness, headache, hypertension (high blood pressure), constipation, vomiting, anxiety, confusion, hallucinations and sleep disturbance.

[3]EXELON:

Exelon particulars:

- Exelon is one of a group of drugs known as “ cholinesterase inhibitors” which is intended to treat symptoms in people with mild to moderate Alzheimer’s disease.
- Exelon works by reducing the breakdown of acetylcholine and thus escalating the amount of the chemical in the brain, a chemical thought to be vital for learning and memory.
- The prescription augments the action of acetylcholine by making the receptors it interacts with in the brain more responsive.
- Exelon is not a cure for Alzheimer’s disease as it does not affect the fundamental degenerative progression of the disease.
- Familiar side effects, in addition to nausea, vomiting, loss of appetite and weight loss, comprise of diarrhea, heartburn, stomach pains, dizziness, headache, weakness, fatigue and difficulty sleeping. A small number of people also experienced fainting.

### [3]REMINYL:

#### Key specifics on reminyl:

- Reminyl ER is one of a group of drugs called “ cholinesterase inhibitors” which is used to treat symptoms in people with mild to moderate Alzheimer’s disease.
- As of June, 2006, Reminyl became available only in the extended release (ER) format. It means that if you were taking Reminyl tablets twice a day prior to June 2006, you would now take a Reminyl ER capsule once a day.

- It augments the action of acetylcholine by making the receptors it interacts with in the brain more responsive. In the area of the brain first affected by Alzheimer's disease, that dealing with cognition and memory, too little acetylcholine is available at the junctions between nerve cells to get messages across to the next nerve cell, The condition is helped, consequently, not only by preserving the acetylcholine from being destroyed by cholinesterase, but by making the receptors more responsive to the inferior amounts of acetylcholine.
- Reminyl ER is not a cure for Alzheimer's disease as it does not affect the fundamental degenerative progression of the disease.
- probable side effects include: abdominal pain, diarrhea, indigestion, decreased appetite, difficulty swallowing, bleeding in the digestive system, weight loss, low blood potassium, low blood pressure, dehydration, seizures, agitation, aggression, hallucinations, weakness, fever, malaise, leg cramps, tingling in the hands or feet, ringing in the ears, headache, dizziness, tiredness, sleeplessness, runny nose, urinary tract infection, fainting or fluttering of the heart.

*INTERNATIONAL MARKET STATISTICS FOR DRUGS USED IN THE TREATMENT OF ALZHEIMERS:*

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Ar ic e pt	do ne pe zil		P fi z e r	1 , 2 6 6	1 , 5 8 0	58 . 10 %
Re mi nyl	gala ntam ine		J & J	2 5 6	3 4 3	12. 60 %
E x el o	rivas tigim ine		No va rti	3 2 0	3 4 0	12 . 50

n			s			%
Na me nd a	me ma ntin e	NM DA A	F o r e s t			29. 41 70 %
E b i x a	me ma ntin e	NM DA A	Lu nd be ck			3. 2 0 %
A x ur a	me man tine	NM DA A	M e r z			0. 60 %
Co gn ex	ta cri ne	C I n	FirstH orizo n			0. 00 %
Others		8	10			3.90%

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TOTAL	1,969	2,719	100.00%

- Total Sales Figures = \$2.7B (2005) with Aricept® having 58% market share.

**DRUGS IN PIPELINE:-**

<i>Name of the drug</i>	<i>sponsor</i>	<i>phase</i>	<i>About the drug</i>	<i>Data from previous phases.</i>
FLURIZAN	Myriad	3	<ul style="list-style-type: none"> <li>• It is a selective amyloid lowering agent (SALA) that reduces levels of the toxic peptide amyloid beta 42 (Aβ42).</li> <li>• Reduces the levels of the</li> </ul>	<ul style="list-style-type: none"> <li>• FLURIZAN has completed Phase2 human clinical trial in 207 patients with Alzheimer’s disease.</li> <li>• Phase 1</li> </ul>

			<p>toxic amyloid beta 42 peptide through the allosteric modulation of gamma- secretase.</p>	<p>safety trial of FLURIZAN in healthy older volunteers identified no serious drug-related side effects.</p> <ul style="list-style-type: none"><li>• In nonclinical studies, FLURIZAN reduced the levels of the toxic peptide A<math>\beta</math>42 by approximat ely 70%, by modulating the action of gamma- secretase.</li></ul>
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				<ul style="list-style-type: none"> <li>• Flurizan reduces amyloid pathology in the brain and prevents memory defects in transgenic mice.</li> </ul>
ALZHEME D	Neurochem Inc.	3	<ul style="list-style-type: none"> <li>• Alzhemed is an oral small organic molecule that has been designed to interfere with the association between glycosaminoglycans (GAGs)</li> </ul>	

			<p>and A<math>\beta</math> amyloid protein. It is thus thought to prevent GAGs from promoting <math>\beta</math>-sheet and amyloid formation.</p> <ul style="list-style-type: none"><li>• Designed to prevent amyloid formation and deposition in the brain, and thus modify the course of AD. Alzhemed is expected to act on two levels: firstly to prevent and stop the formation and</li></ul>	
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			<p>deposition of amyloid fibrils in the brain as well as to bind to soluble A<math>\beta</math>, and secondly to to inhibit the inflammatory response associated with amyloid build-up in AD.</p> <ul style="list-style-type: none"> <li>• Inhibit A<math>\beta</math> fibrillization and binds and reduces soluble A<math>\beta</math>.</li> </ul>	
VP0 25	Vaso gen		<ul style="list-style-type: none"> <li>• Mediated via the regulation of microglial cell</li> </ul>	<ul style="list-style-type: none"> <li>• Considerable amount of preclinical work has demonstrated: -</li> </ul>

			<p>activation.</p> <ul style="list-style-type: none"> <li>• Treatment with VP025 reversed age-related decreases in CD200 levels in the brain, reduced levels of microglial cell activation, and restored memory and learning function.</li> </ul>	<p>the ability of VP025 to reduce inflammation in models of a number of neurodegenerative diseases.</p> <ul style="list-style-type: none"> <li>• the ability of VP025 to reverse detrimental neurological effects of chronic beta-amyloid exposure</li> <li>• the ability of VP025 to reverse age-related inflammation in the brain</li> </ul>
AA B-001	Elan Pharmaceuticals, Inc., Wyeth.		<ul style="list-style-type: none"> <li>• Designed to bind and remove the A<math>\beta</math> peptide that accumulates in</li> </ul>	<ul style="list-style-type: none"> <li>• Anti-A<math>\beta</math> antibodies have been shown to prevent the accumulation</li> </ul>



		<p>the brain.</p> <ul style="list-style-type: none"><li>• Immunotherapy approaches to the treatment of Alzheimer disease is based on the ability of antibodies raised against A<math>\beta</math> peptides to bind to and clear A<math>\beta</math> from the brain, thus removing the peptide and inhibiting the damage to neurons that A<math>\beta</math> inflicts.</li></ul>	<p>of A<math>\beta</math> peptides in the brains of transgenic mouse models of AD (Shenk et al., 1999; Bard et al., 2000; DeMattos et al., 2001).</p> <ul style="list-style-type: none"><li>• In one clinical trial, patients immunized with A<math>\beta</math> peptide who actively generated anti-A<math>\beta</math> antibodies showed a significantly slower rate of decline in cognitive functions (Hock et al., 2003).</li><li>• Long-term follow-up</li></ul>
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			<p>studies of the patients who were involved in the failed phase 2a clinical trial of AN-1792 has shown that NTB (quality of life) scores remained significantly improved in antibody responders. In addition, CSF tau was significantly decreased in antibody responders (Gilman et al., 2005).</p>
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*Closing In on Alzheimer's:-*

Lastly, fresh drugs tender genuine hope for repealing the malady.

- Concluding test outcomes will be out, for a complete novel generation of drugs designed to assault the fundamental basis of Alzheimer's disease—medicines that propose, what one specialist calls “ legitimate, substantial, irrefutable hope” for those with mild to moderate forms of the illness.
- Within three years, it's nearly assured, we'll have disease-modifying drugs that fundamentally amend the nature of Alzheimer's.
- From drugs which facilitate alleviation of merely the symptoms of the disease, we are now moving towards an era which will comprise of drugs that not only slow down the disease, but encompass the potential to wholly reverse it.
- Scientists are certain that one of the more than four dozen drugs now in human trials will succeed. One of the most hopeful of those, Flurizan, from Myriad Genetics, should complete its tests in the next 18 months.
- Exceedingly few drugs make it to Phase III clinical trials, the final stride before a drug goes to the FDA for authorization. Today, conversely, nine new Alzheimer's treatments are in Phase III trials to test their effectiveness on a large number of patients. And dozens more are in smaller Phase II trials.
- This subsequent generation of drugs is deliberated to avert, obliterate and clean out deposits of beta-amyloid plaque that exterminate the brain's nerve cells, leading to the distressing loss of memory, reason and, eventually, life that typifies Alzheimer's.

- This optimistic information comes as the world awaits an epidemic of Alzheimer's, the traumatic variety of dementia that Americans tell pollsters they dread more than heart disease, stroke or diabetes. Today, 5.1 million people in the United States suffer from the disease, but the supreme risk factor is age—the longer a person lives, the greater the likelihood—and in just four years millions of boomers begin to turn 65. One in eight people age 65 and older now has Alzheimer's; half of those 85 and older have it.
- Connoisseurs say still if Alzhemed or another of these premature anti-amyloid drugs fails, that doesn't mean the amyloid theory is incorrect. It merely may mean that the drug didn't eliminate sufficient plaque to appreciably slow or arrest the disease.
- Finally, with the advent of such promising drugs into the market in the near future, there is potential to mitigate the humanity of the exorbitant fiscal burden due to the disturbing tempo at which Alzheimer's is making headway. Keeping our fingers crossed might just help.

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