

# CNS Market Outlook

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**Bourne Partners**



Healthcare Financial Advisory

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## CNS Overview

- The CNS space is defined as an area of healthcare and pharmacology focused on treatment of diseases and disorders affecting various components of the Central Nervous System
- Areas of therapeutic focus within the CNS landscape include:
  - Schizophrenia
  - Depressive Disorders
  - Epilepsy
  - Alzheimer's Disease (AD)
  - Parkinson's disease (PD)
  - Insomnia
  - Migraine
  - Attention Deficit Hyperactivity Disorder (ADHD)
  - Addiction
  - Pain management
- Significant percentage – 35% of worldwide disease burden is due to CNS disorders<sup>1</sup>
- CNS sales worldwide were valued at \$84.4 billion in 2008, an increase of 7.9% from the previous year, driven primarily by upticks in AD, epilepsy, and ADHD incidence<sup>2</sup>

Source:

1. "The CNS Market Outlook to 2013." *Business Insights*. P. 14.

2. "The CNS Market Outlook to 2014." *Business Insights*. P. 12.

# The Schizophrenia Market Landscape

- Schizophrenia is an acute brain disease with a variety of symptoms
  - Typically auditory and visual hallucinations and delusions
  - Behavioral and emotional impairments and loss of cognitive abilities
  - Often comorbid with another learning or psychiatric disorder ~38% of patients<sup>1</sup>
- Regularly treated through combination of psychological therapy and either typical or atypical antipsychotic medication to alleviate “positive” and psychotic symptoms
- Prevalence across the seven largest pharmaceutical markets averages 1.1% of the population; expected to grow slightly through 2014<sup>1</sup>

Prevalence of Schizophrenia – 2008 <sup>2</sup>			
Market	Prevalence (000s)	Prevalence (%)	Share %
France	743	1.2	9.2
Germany	992	1.2	12.3
Italy	472	0.8	5.9
Spain	267	0.6	3.3
UK	670	1.1	8.3
EU-5	3,144	1.0	39.0
US	3,487	1.1	43.3
Japan	1,432	1.1	17.8
<b>Total</b>	<b>8,062</b>	<b>1.1</b>	<b>100.0</b>

Projected Prevalence of Schizophrenia - 2008-2014 <sup>2</sup>								
Year	2008	2009	2010	2011	2012	2013	2014	CAGR <sup>3</sup>
France	743	743	748	751	753	756	759	0.36%
Germany	992	994	995	996	998	999	1,000	0.13%
Italy	472	473	474	474	475	476	477	0.18%
Spain	267	267	268	269	270	270	271	0.25%
UK	670	672	674	676	678	680	682	0.30%
EU-5	3,144	3,151	3,159	3,166	3,174	3,182	3,189	0.24%
US	3,487	3,615	3,747	3,884	4,026	4,173	4,326	3.66%
Japan	1,432	1,456	1,480	1,505	1,530	1,555	1,581	1.66%
<b>Total #</b>	<b>8,062</b>	<b>8,221</b>	<b>8,385</b>	<b>8,555</b>	<b>8,730</b>	<b>8,910</b>	<b>9,097</b>	<b>2.03%</b>
<b>Total %</b>	<b>1.10%</b>	<b>1.10%</b>	<b>1.10%</b>	<b>1.10%</b>	<b>1.10%</b>	<b>1.20%</b>	<b>1.20%</b>	<b>1.46%</b>

Source:

1. "The CNS Market Outlook to 2013." *Business Insights*. P. 30-32. Figures in 000s. All figures are rounded  
 2. "The CNS Market Outlook to 2014." *Business Insights*. P. 32-33. Figures in 000s. All figures are rounded.  
 3. CAGR is over entire six-year period (2008 – 2014).



# The Depressive Disorders Market Landscape

- Depressive disorders (DD) encompass a broad spectrum of conditions with physical and emotional symptoms; three main classifications include<sup>1</sup>:
  - Major/clinical depression: significant feelings of despair for extended periods
  - Dysthymia: comparable to clinical depression in milder, less debilitating form
  - Bipolar disorder: “manic-depression” characterized by large mood swings
- All affect everyday life and can predispose afflicted to self-harm and/or suicide
- Comorbidity with a variety of other disorders (e.g., panic/anxiety, OCD)
- Treatments for each include a combination of psychological and chemical therapy
- Incidences of depressive disorders are largely even across the major markets excluding Japan

Prevalence of Depressive Disorders - 2008 <sup>1</sup>			
Market	Prevalence (000s)	Prevalence (%)	Share %
France	4,127	6.7	9.3
Germany	5,576	6.7	12.6
Italy	3,927	6.7	8.9
Spain	2,737	6.2	6.2
UK	4,123	6.8	9.3
EU5	20,489	6.8	46.2
US	20,143	6.5	45.4
Japan	3,726	2.9	8.4
<b>Total</b>	<b>44,359</b>	<b>6.1</b>	<b>100.0</b>

Projected Prevalence of DDs - 2008-2014 <sup>1</sup>								
Year	2008	2009	2010	2011	2012	2013	2014	CAGR <sup>2</sup>
France	4,127	4,161	4,196	4,232	4,268	4,304	4,340	0.84%
Germany	5,576	5,632	5,689	5,747	5,805	5,864	5,923	1.01%
Italy	3,927	3,959	3,991	4,024	4,057	4,090	4,123	0.82%
Spain	2,737	2,765	2,793	2,821	2,849	2,878	2,906	1.00%
UK	4,123	4,175	4,227	4,280	4,334	4,388	4,443	1.25%
EU-5	20,489	20,692	20,897	21,103	21,312	21,523	21,736	0.99%
US	20,143	20,415	20,690	20,969	21,252	21,539	21,830	1.35%
Japan	3,726	3,757	3,787	3,818	3,849	3,881	3,912	0.82%
<b>Total #</b>	<b>44,359</b>	<b>44,863</b>	<b>45,374</b>	<b>45,891</b>	<b>46,413</b>	<b>46,942</b>	<b>47,478</b>	<b>1.14%</b>
<b>Total %</b>	<b>6.00%</b>	<b>6.00%</b>	<b>6.00%</b>	<b>6.10%</b>	<b>6.10%</b>	<b>6.10%</b>	<b>6.20%</b>	<b>0.55%</b>

Source:

1. "The CNS Market Outlook to 2014." Business Insights. P. 25-26. Figures in 000s. All figures are rounded.

2. CAGR is over entire six-year period (2007 – 2013).



# The Epilepsy Market Landscape

- Epilepsy is a categorical term for two major seizure disorders<sup>1</sup>
  - Idiopathic: No identifiable genesis for seizures that represents 70% of afflicted
  - Symptomatic: Underlying disorders (i.e., tumors, etc.) cause seizures; represent 30% of those afflicted
- In both cases seizures triggered by an array of factors (e.g, strong stimuli or hormonal changes) and can occur throughout life
- Disorder treated with either anticonvulsant or antiepileptic medications (e.g., Depakine, Lamictal, Tegretol, Topamax)
- Frequency of epilepsy amongst world population expected to remain relatively flat

Prevalence of Epilepsy - 2008 <sup>1</sup>			
Market	Prevalence (000s)	Prevalence (%)	Share %
France	483	0.8	7.9
Germany	645	0.8	10.5
Italy	336	0.6	5.5
Spain	182	0.4	3
UK	262	0.4	4.3
EU5	1,908	0.6	31.1
US	2,835	0.9	46.2
Japan	1,397	1.1	22.8
<b>Total</b>	<b>6,140</b>	<b>0.8</b>	<b>100</b>

Prevalence of Epilepsy - Projected 2008-2014 <sup>1</sup>								
Year	2008	2009	2010	2011	2012	2013	2014	CAGR <sup>2</sup>
France	483	485	486	488	490	492	494	0.38%
Germany	645	646	647	648	649	650	651	0.15%
Italy	336	337	337	338	338	339	339	0.15%
Spain	182	183	183	183	184	184	185	0.27%
UK	262	263	264	264	265	266	267	0.32%
EU-5	1,908	1,913	1,917	1,922	1,927	1,931	1,936	0.24%
US	2,835	2,856	2,877	2,898	2,920	2,941	2,963	0.74%
Japan	1,397	1,399	1,401	1,404	1,406	1,408	1,410	0.15%
<b>Total #</b>	<b>6,140</b>	<b>6,168</b>	<b>6,196</b>	<b>6,224</b>	<b>6,252</b>	<b>6,280</b>	<b>6,309</b>	<b>0.45%</b>
<b>Total %</b>	<b>0.82%</b>	<b>0.82%</b>	<b>0.82%</b>	<b>0.82%</b>	<b>0.82%</b>	<b>0.82%</b>	<b>0.82%</b>	<b>0.00%</b>

Source:

1. "The CNS Market Outlook to 2014." Business Insights. P. 28-29. Figures in 000s. All figures are rounded.  
 2. CAGR is over entire six-year period (2007 – 2013).



# The Alzheimer's Disease Market Landscape

- Alzheimer's Disease (AD) is neurodegenerative, typically presenting in elderly patients over 60 through memory and cognitive losses as well as emotional, behavioral, and physical changes
  - Progresses through three main stages: mild, moderate, and severe
  - Can be early onset (i.e., prior to age 60)
- Comorbidity with other CNS disorders a possibility (e.g., depression, anxiety)
- Treatments limited to symptom management rather than cures, focusing on memory improvement and potentially treating underlying brain structure issues
- Afflicted population worldwide expected to increase through 2014 as population ages; increase particularly pronounced in areas with older demographic

Prevalence of Alzheimer's Disease - 2008 <sup>1</sup>			
Market	Prevalence (000s)	Prevalence (%)	Share %
France	505	0.8	7.5
Germany	718	0.9	10.6
Italy	565	1	8.4
Spain	363	0.8	5.4
UK	471	0.9	7
EU5	2,622	0.9	38.8
US	2,801	0.9	41.5
Japan	1,334	1	19.7
<b>Total</b>	<b>6,757</b>	<b>0.9</b>	<b>100</b>

Prevalence of AD - Projected 2008-2014 <sup>1</sup>								
Year	2008	2009	2010	2011	2012	2013	2014	CAGR <sup>2</sup>
France	505	511	517	523	529	535	541	1.15%
Germany	718	735	752	769	787	805	824	2.32%
Italy	565	577	590	603	616	629	643	2.18%
Spain	363	371	380	389	399	408	418	2.38%
UK	471	480	489	499	509	518	528	1.92%
EU-5	2,622	2,674	2,728	2,783	2,839	2,897	2,955	2.01%
US	2,801	2,851	2,902	2,954	3,006	3,060	3,114	1.78%
Japan	1,334	1,364	1,395	1,426	1,458	1,491	1,524	2.24%
<b>Total #</b>	<b>6,757</b>	<b>6,890</b>	<b>7,025</b>	<b>7,163</b>	<b>7,304</b>	<b>7,447</b>	<b>7,594</b>	<b>1.97%</b>
<b>Total %</b>	<b>0.9</b>	<b>0.9</b>	<b>0.9</b>	<b>0.9</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.77%</b>

Source:

1. "The CNS Market Outlook to 2014." Business Insights. P. 36-37. Figures in 000s. All figures are rounded.  
 2. CAGR is over entire six-year period (2007 - 2013).



# The Parkinson's Disease Market Landscape

- Parkinson's Disease (PD) is a neurodegenerative disorder primarily associated with increasingly deteriorating motor skills with the following major symptoms<sup>1</sup>
  - Bradykinesia, tremors, loss of coordination and balance
  - Memory impairment and dementia
- As no cure currently exists, treatment focuses on symptom alleviation to improve quality of life through use of dopaminergics, Monoamine Oxidase Inhibitors (MAOIs), and Catechol-o-methyl transferase (COMT) inhibitors
- Generally affects individuals older than 50; incidences are directly correlated with population age and prevalence is expected to increase in rapidly aging populations

Prevalence of Parkinson's Disease - 2008 <sup>1</sup>			
Market	Prevalence (000s)	Prevalence (%)	Share %
France	144	0.23	9.7
Germany	195	0.24	13.2
Italy	154	0.26	10.4
Spain	121	0.27	8.1
UK	92	0.15	6.2
EU5	707	0.23	47.6
US	621	0.2	41.8
Japan	157	0.12	10.6
<b>Total</b>	<b>1,484</b>	<b>0.2</b>	<b>100</b>

Prevalence of PD - Projected 2008-2014 <sup>1</sup>								
Year	2008	2009	2010	2011	2012	2013	2014	CAGR <sup>2</sup>
France	144	148	153	157	162	166	171	2.91%
Germany	195	201	207	213	219	225	231	2.86%
Italy	154	158	161	165	168	172	176	2.25%
Spain	121	124	127	130	134	137	140	2.46%
UK	92	94	96	99	101	103	105	2.23%
EU-5	707	725	744	763	783	803	824	2.59%
US	621	635	650	665	680	695	711	2.28%
Japan	157	160	162	165	168	171	174	1.73%
<b>Total #</b>	<b>1,484</b>	<b>1,520</b>	<b>1,556</b>	<b>1,593</b>	<b>1,631</b>	<b>1,670</b>	<b>1,710</b>	<b>2.39%</b>
<b>Total %</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.00%</b>

Source:

1. "The CNS Market Outlook to 2014." Business Insights. P. 39-40. Figures in 000s. All figures are rounded.  
 2. CAGR is over entire six-year period (2007 - 2013).



## The Insomnia Market Landscape

- Insomnia is a major sleep disorder classified into three categories<sup>1</sup>:
  - Transient: insufficient sleep for 1-3 weeks
  - Acute: insufficient sleep for 3 weeks – 6 months after which normal sleep resumes
  - Chronic: over a month of nightly sleep deficiency
- Treated generally with hypnotic drugs in the benzodiazepine class (e.g., midazolam, diazepam)
- Problematic as these drugs can be habit-forming
- Newer, non-benzodiazepine class drugs far less addictive (e.g., Ambien, Lunesta)<sup>1</sup>
- Prevalence relatively even across major markets although incidence higher amongst women and increases with age

Prevalence of Insomnia - 2008 <sup>1</sup>			
Market	Prevalence (000s)	Prevalence (%)	Share %
France	2,934	5.6	9.9
Germany	2,661	4	9
Italy	3,505	7	11.8
Spain	2,023	5.8	6.8
UK	3,240	6.4	11
EU5	14,363	5.7	48.6
US	11,020	5	37.3
Japan	4,198	4	14.2
<b>Total</b>	<b>29,581</b>	<b>5.1</b>	<b>100</b>

Source:  
 1. "The CNS Market Outlook to 2014." Business Insights. P. 44.  
 Figures in 000's. All figures are rounded.

# The Migraine Market Landscape

- Migraines are headaches manifesting an underlying neurological disorder
  - Classical (with aura) or Common (without aura)
  - Characterized by pulsating, localized pain lasting 4 – 72 hrs
  - Often accompanied by nausea, vomiting, photo/phonophobia, numbness
- Migraine treatment seeks to either<sup>1</sup>
  - Alleviate symptoms (e.g., Triptans)
  - Prevent occurrence (e.g., Topamax, Transcranial Magnetic Stimulation)
- Most common CNS disorder across seven major markets
  - Potential customer pool may be larger as self-treatment through OTC medication can distort reported number of afflicted individuals<sup>1</sup>

Prevalence of Migraines - 2008 <sup>1</sup>			
Market	Prevalence (000s)	Prevalence (%)	Share %
France	4,945	8	6.5
Germany	9,172	11.1	12
Italy	7,095	12	9.3
Spain	7,044	15.9	9.2
UK	6,325	10.4	8.3
EU5	34,581	11.2	45.3
US	33,940	11	44.4
Japan	7,834	6.1	10.3
<b>Total</b>	<b>76,355</b>	<b>10.2</b>	<b>100</b>

Prevalence of Migraines - Projected 2008-2014 <sup>1</sup>								
Year	2008	2009	2010	2011	2012	2013	2014	CAGR <sup>2</sup>
France	4,945	5,022	5,099	5,178	5,258	5,340	5,422	1.55%
Germany	9,172	9,258	9,345	9,433	9,522	9,612	9,702	0.94%
Italy	7,095	7,246	7,400	7,557	7,718	7,882	8,049	2.12%
Spain	7,044	7,138	7,233	7,329	7,427	7,525	7,625	1.33%
UK	6,325	6,392	6,460	6,528	6,597	6,667	6,738	1.06%
EU-5	34,581	35,056	35,537	36,026	36,522	37,026	37,537	1.38%
US	33,940	34,241	34,545	34,852	35,162	35,474	35,789	0.89%
Japan	7,834	7,994	8,156	8,322	8,492	8,664	8,841	2.04%
<b>Total #</b>	<b>76,355</b>	<b>77,290</b>	<b>78,239</b>	<b>79,200</b>	<b>80,175</b>	<b>81,164</b>	<b>82,167</b>	<b>1.23%</b>
<b>Total %</b>	<b>10.2</b>	<b>10.3</b>	<b>10.4</b>	<b>10.5</b>	<b>10.6</b>	<b>10.6</b>	<b>10.8</b>	<b>0.96%</b>

Source:

1. "The CNS Market Outlook to 2014." Business Insights. P. 42-43. Figures in 000s. All figures are rounded.

2. CAGR is over entire six-year period (2007 – 2013).



# The ADHD Market Landscape

- Attention Deficit Hyperactivity Disorder (ADHD) is neurobehavioral, primarily affects children (particularly boys) and is associated with the following issues:
  - Inability to maintain attention
  - Impulsive and hyperactive behavior
- Often difficult to diagnose given typical age of afflicted and natural tendency of age group towards some level of inattentiveness, hyperactivity and impulsiveness
- Generally treated with a combination of cognitive/behavioral therapy and drug treatment (e.g., Dexedrine, Ritalin, Adderall)
- ADHD prevalence decreases with age<sup>1</sup>

Prevalence of Child ADHD - 2008 <sup>1</sup>			
Market	Prevalence (000s)	Prevalence (%)	Share %
France	638	5.4	6.8
Germany	626	5	6.6
Italy	582	7.1	6.2
Spain	266	4.6	2.8
UK	554	5	5.9
EU5	2,666	5.4	28.3
US	5,362	8.7	56.9
Japan	1,399	7.7	14.8
<b>Total</b>	<b>9,427</b>	<b>7.3</b>	<b>100</b>

Prevalence of Adult ADHD - 2008 <sup>1</sup>			
Market	Prevalence (000s)	Prevalence (%)	Share %
France	2,113	4.4	8.5
Germany	2,905	4.4	11.6
Italy	2,105	4.4	8.4
Spain	1,452	4.4	5.8
UK	2,030	4.4	8.1
EU5	10,605	4.4	42.5
US	9,760	4.4	39.1
Japan	4,610	4.4	18.5
<b>Total</b>	<b>24,975</b>	<b>4.4</b>	<b>100</b>

Source:  
1. "The CNS Market Outlook to 2014." Business Insights. P. 46. Figures in oos. All figures are rounded.



# The Addiction Market Landscape

- Addiction is defined as dependence on a particular substance or activity
  - For the purposes of this report, addiction to chemical substances (i.e., drugs, tobacco, alcohol) will be the primary focus
- Disorder is comprised of physical and psychological elements; therefore treatment for various addictions is often a combination of cognitive/behavioral and pharmaceutical therapies such as:
  - Opioids : Methadone, Buprenorphine, Naltrexone
  - Tobacco: Bupropion, Varenicline, Nicotine Replacement Therapy (NRT)
  - Alcohol: Naltrexone, Acamprostate, Disulfiram, Topiramate
- Prevalence of addiction worldwide varies depending on substance abused:

Worldwide Addiction Statistics <sup>1</sup> , 2010		
Substance	# People (000s)	% Population <sup>2</sup>
Alcohol	76,300	1.54%
Tobacco	1,100,000	22.26%
Opioids	13,500	0.27%
Cocaine	74,132	1.50%
<b>Total</b>	<b>75,433</b>	<b>25.57%</b>

Source:

1. WHO: Substance Abuse Statistics.

Note:

1. Overlap exists between substance abuse (resulting in possible double-counting); this is potentially offset by other drugs used not listed above (e.g., prescription drug abuse).

2. Population figure used for % population calculated using percentage of base world population of 6.77B over the age of 15 (i.e., 73% of the world's population).

# The Pain Management Market Landscape

- Pain management comprises one of the largest sub-sectors within the CNS market, with two major areas of treatment
  - Neuropathic pain – disorders of peripheral nervous system (e.g., fibromyalgia, back pain)
  - Nociceptive pain – physical pain not associated with direct nerve damage/disorder (e.g., osteoarthritis and rheumatoid arthritis)
- Drug classes for pain management typically include<sup>1</sup>:
  - Opiate and Non-opiate
  - Non-steroidal anti-inflammatory drugs (NSAIDs)
  - Anti-convulsants and anti-depressants
- The global pain management market was valued at \$46.4 billion in 2007 and is expected to reach \$57.2 billion by 2014, a CAGR of 3.1%<sup>1</sup>
  - This growth will largely be driven by the strength in the analgesics segment
- Largest participants in pain management segment include Pfizer, Johnson & Johnson, Novartis, and GlaxoSmithKline

Source:

1. "The Pain Management Market Outlook to 2014." *Business Insights*.

## Sales & Growth in the CNS Market (Excluding Pain)

Global CNS Market by Drug Category (\$M) 2008-2014 <sup>1</sup>								
Drug Class	Sales '08	Sales '09	Sales '10	Sales '11	Sales '12	Sales '13	Sales '14	CAGR
Antipsychotics	22,545	24,190	25,400	25,690	22,330	19,460	17,200	-4.4%
Antidepressants	20,213	20,367	20,760	20,440	18,120	14,350	12,010	-8.3%
Anticonvulsants	16,743	13,950	12,010	10,870	10,190	9,627	9,363	-9.2%
Anti-Alzheimer drugs	6,626	7,440	8,406	7,765	7,253	6,780	6,958	0.8%
ADHD & narcolepsy medications	5,761	5,864	6,061	6,325	6,080	5,915	5,860	0.3%
Hypnotics/sedatives	4,444	4,085	3,955	3,950	3,725	3,470	3,370	-4.5%
Anti-Parkinson drugs	4,104	4,460	3,905	3,760	3,570	3,430	3,385	-3.2%
Anti-migraine drugs	3,954	3,605	3,617	3,720	3,852	3,451	3,165	-3.6%
<b>Total</b>	<b>84,389</b>	<b>83,961</b>	<b>84,114</b>	<b>82,520</b>	<b>75,120</b>	<b>66,483</b>	<b>61,311</b>	<b>-5.2%</b>

- Decreasing sales across the global CNS market is due to patent expiry of significant products within most therapeutic categories

Source:

1. "The CNS Market Outlook to 2014." *Business Insights*. P. 33-36, "Pain Market Outlook to 2011." *Business Insights*, p. 10-13, and WHO Substance Abuse Statistics. Figures in o00s. All figures are rounded.

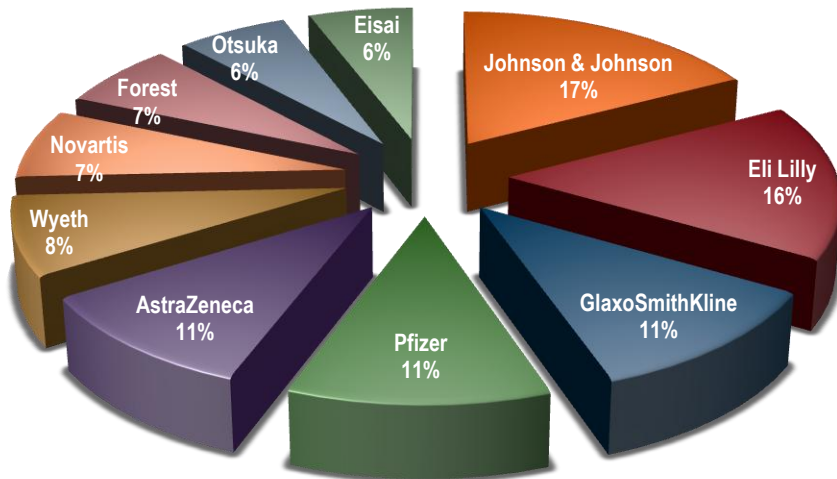
2. CAGR is over entire six-year period (2007 - 2013).



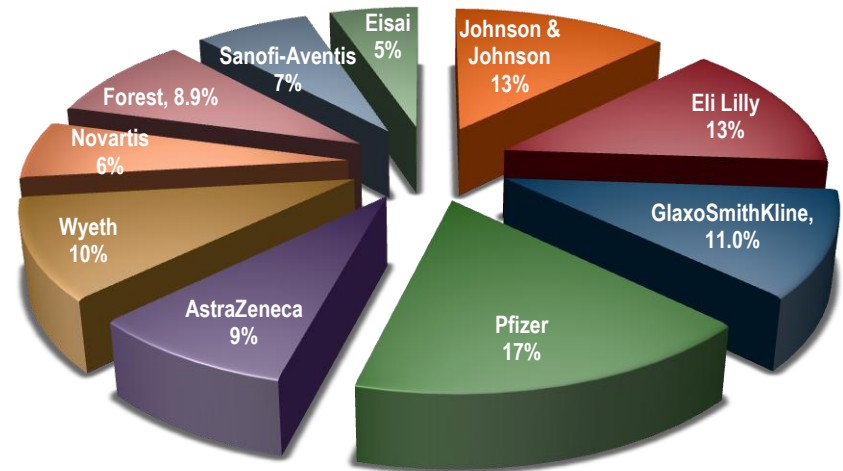
# Major Players in the CNS Market

- Global CNS Market is dominated by ten major pharmaceutical companies<sup>1</sup>
- Patent expiration and subsequent introduction of generic formulations are expected to affect major player market share<sup>1</sup>

**Top 10 CNS Players 2008 (Market Share)**



**Projected CNS Market Share - 2013**



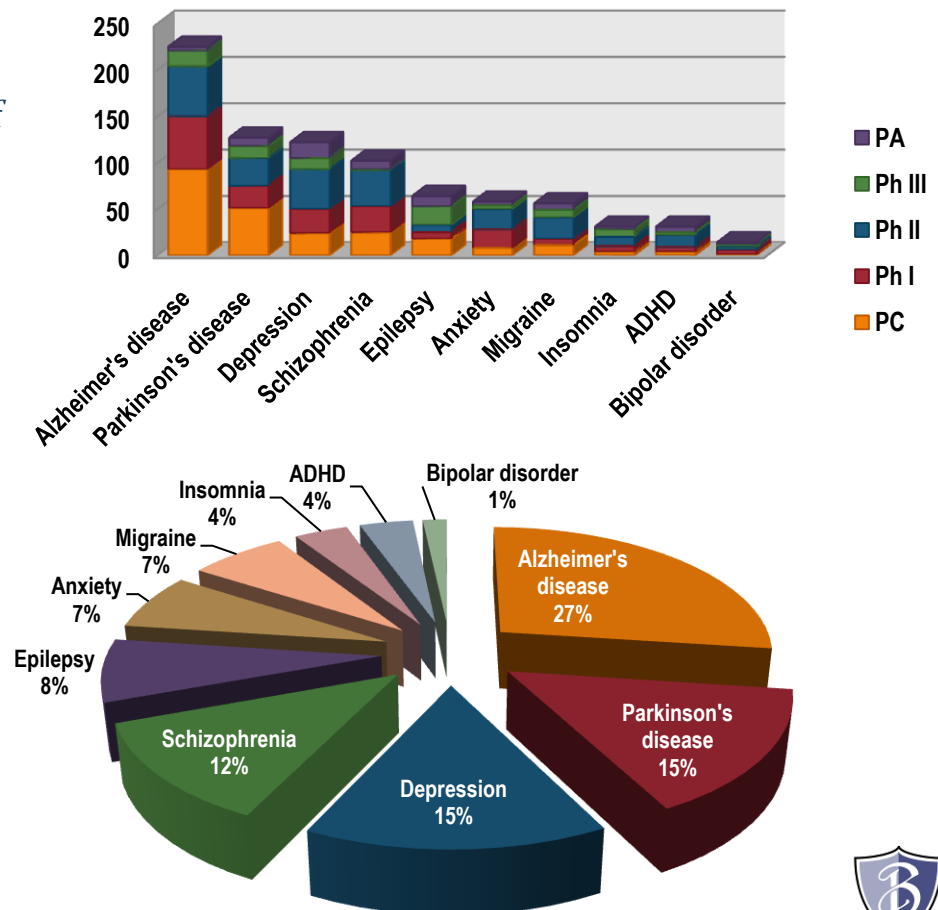
- Opportunity for “non-majors” to gain share in CNS space through generic sales and focus on high growth potential treatments in AD, ADHD, and PD indications

Source:  
 1. "The CNS Market Outlook to 2014." Business Insights. Does not include pain management segment.

# Pipeline Statistics

- Strongest growth prospects expected in AD treatment as additional resources seek to find solutions for currently unmet needs in addition to larger elderly population
- Search for new compounds to replace drugs off patent protection continues, with focus on improvements/innovations in the following areas:
  - Drugs with disease modifying capabilities
  - Differentiated compounds
  - Novel drug delivery composition
  - Combined treatments with broader applications

- Expected growth reflected in strong pipeline<sup>1</sup>



Source:  
 1. "CNS Market Outlook to 2013." Business Insights. Does not include pain management segment.



# Pipeline Drugs

CNS Pipeline Forecast - 2008-2013 <sup>1</sup>						
Drug	Indication	Company	Status	Sales 2008	Sales 2010	Sales 2013
Bapineuzumab	AD	Pfizer/Elan/JnJ	Phase III	NA	NA	750
Semagacestat	AD	Eli Lilly	Phase III Halted Aug 2010	NA	NA	500
Pristiq	Depression	Pfizer	Approved	100	225	500
Saredutant	Depression	Sanofi-Aventis	Phase III Halted April 2009	NA	50	350
Invega	Schizophrenia	J&J	Approved	375	850	400
Paliperidone-Palmitate	Schizophrenia	J&J	Approved	NA	NA	450
Asenapine	Schizophrenia	Merck	Approved	NA	NA	NA
Eplivanserin	Insomnia	Sanofi-Aventis	Submission Pulled Dec. 2009	NA	180	350
Almorexant	Insomnia	GSK/Actelion	Phase III	NA	NA	600
Telcagepant	Migraine	Merck	Phase III	NA	120	700
Treximet	Migraine	GSK	Approved	50	200	450
Inovelon	Epilepsy	Eisai	Approved	NA	NA	NA
Vimpat	Epilepsy	UCB	Approved	NA	NA	NA
Vyvanse	ADHD	Shire	Approved	300	730	900

Source:

1. "CNS Market Outlook to 2013." Business Insights. Does not include pain management segment.

# Select Comparable Transactions

(\$ in millions)

Date	Target	Buyers	Implied EV	Revenue	EBITDA	EV/Revenues (a)	EV/EBITDA (b)
10/11/2010	King Pharmaceuticals Inc. (NYSE:KG)	Pfizer Inc. (NYSE:PFE)	\$3,324.7	\$1,654.2	\$391.9	2.0x	8.5x
9/17/2010	Penwest Pharmaceuticals Co. (NasdaqGM:PPCO)	Endo Pharmaceuticals Holdings Inc. (NasdaqGS:ENDP)	155.3	35.7	15.4	4.4x	10.1x
8/9/2010	Shire US Inc., Daytrana	Noven Pharmaceuticals, Inc.	NA	NA	NA	NA	NA
6/20/2010	Valeant Pharmaceuticals International (NYSE:VRX)	Biovail Corporation (TSX:BVF)	3,676.1	884.5	369.3	4.2x	10.0x
5/10/2010	Global (excluding EU) rights to PRIALT	Azur Pharma	20.0	NA	NA	NA	NA
4/7/2010	Orexo AB (OM:ORX) - (10.7% stake)	Novo A/S	114.5	33.1	NA	3.5x	NA
12/31/2009	P.N. Gerolymatos	Alapis S.A.	NA	NA	NA	NA	NA
10/20/2009	Sepracor, Inc.	Dainippon Sumitomo Pharma America Holdings, Inc.	2,354.1	1,333.8	305.7	1.8x	7.7x
10/12/2009	License for Fanapt	Novartis AG	NA	NA	NA	NA	NA
9/14/2009	Alpine Biomed	Natus Medical	43.2	35.0	NA	1.2x	NA
8/21/2009	Schwarz Pharma AG - (0.41% stake)	UCB SA (ENXTBR:UCB)	8,214.1	611.9	258.7	13.4x	31.8x
7/14/2009	Noven Pharmaceuticals	Hisamitsu Pharmaceutical	413.0	19.4	NA	21.3x	NA
6/16/2009	U.S. rights to pain medicines	Covidien Ltd.	NA	NA	NA	NA	NA
5/18/2009	Rights to Tetrabenzine	Biovail Corporation	230.0	63.2	NA	3.6x	NA
5/6/2009	U.S. rights to Wellbutrin XL	Biovail Corporation	510.0	140.0	NA	3.6x	NA
3/31/2009	UCB SA, Equasym IR and Equasym XL	Shire plc (LSE:SHP)	69.4	21.3	NA	3.3x	NA
3/9/2009	OAVATION Pharmaceuticals, Inc.	H. Lundbeck, Inc.	900.0	204.0	43.0	4.4x	20.9x
2/25/2009	Zentiva N.V.	Sanofi-Aventis (ENXTPA:SAN)	2,531.7	824.5	215.5	3.1x	11.7x
2/6/2009	Smartpoint International Limited	Winteam Pharmaceutical Group Limited (SEHK:570)	49.2	28.2	8.2	1.7x	6.0x
1/27/2009	LifeCycle Pharma A/S (CPSE:LCP)	Lfi A/s	76.6	30.1	NA	2.5x	NA
1/13/2009	Laboratorios Almirall SA, 13 Products	Kern Pharma, S.L.	25.2	10.6	NA	2.4x	NA
12/23/2008	Euticals S.p.A.	Mandarin Capital Management SA	115.5	69.7	13.9	1.7x	8.3x
11/8/2008	NanoDel Technologies GmbH	Capsulation Pharma AG	NA	NA	NA	NA	NA
10/2/2008	Roche Holding AG, 4 Pharmaceutical Products	Meda AB (OM:MEDA A)	176.2	77.9	NA	2.3x	NA
9/8/2008	Prestwick Pharmaceuticals, Inc.	Biovail Corporation	200.8	NA	NA	NA	NA
7/22/2008	Bentley Pharmaceuticals, Inc.	Teva Pharmaceutical Industries Limited (NasdaqGS:TEVA)	339.2	133.3	20.0	2.5x	17.0x
6/20/2008	CeNeS Pharmaceuticals Plc	Paion AG (XTRA:PA8)	16.5	1.0	NA	15.8x	NA

NM - not meaningful

NA - not available

Note:

a) Schwarz/UCB, Noven/Hisamitsu and CeNes/Paion transactions are excluded from EV/Revenue analysis

b) Schwarz/UCB transaction is excluded from EV/EBITDA analysis

<b>Median</b>	<b>2.5x</b>	<b>10.0x</b>
<b>Mean</b>	<b>2.8x</b>	<b>11.1x</b>
<b>High</b>	<b>4.4x</b>	<b>20.9x</b>
<b>Low</b>	<b>1.2x</b>	<b>6.0x</b>



# CNS Comparable Trading

\$ in millions, except for per-share amounts

Company	Ticker	Share Price	Shares Out	Equity Value	Net Debt (Cash)	Enterprise Value	LTM				CYE		CYE EPS	CYE+1 EPS	Book Value
							Sales	EBITDA	EBIT	EPS	Sales	EBITDA			
Eisai Co., Ltd	TSE:4523	\$35.14	284.9	\$10,012.2	\$2,872.4	\$12,884.6	\$9,182.2	\$1,981.7	\$1,343.5	\$2.43	NA	NA	NA	NA	\$971.4
Elan Corp. plc	NYSE:ELN	6.04	585.1	3,533.8	654.4	4,188.2	1,166.4	135.0	66.7	(0.18)	1,171.2	86.7	(\$0.20)	(\$0.07)	76.8
Forest Laboratories Inc.	NYSE:FRX	33.40	285.5	9,537.2	(3,289.9)	6,247.3	4,221.4	862.8	789.1	2.03	4,281.9	1,424.7	3.77	4.12	4,408.2
H. Lundbeck A/S	CPSE:LUN	19.51	196.1	3,826.1	(2.1)	3,823.9	2,394.2	732.9	583.4	1.75	NA	NA	NA	NA	207.8
King Pharmaceuticals Inc.	NYSE:KMG	14.17	249.7	3,537.7	(245.2)	3,292.5	1,654.2	391.9	171.8	0.56	1,481.3	375.2	0.66	0.69	1,107.6
Shire plc	LSE:SHP	23.85	546.8	13,042.7	424.3	13,467.0	3,225.8	1,053.8	816.4	0.75	3,375.1	1,167.0	1.35	1.56	(262.9)
Stada Arzneimittel AG	DB:SAZ	32.67	58.8	1,920.4	1,108.4	3,028.8	1,954.5	375.1	274.6	2.38	NA	NA	NA	NA	(58.4)
UCB SA	ENXTBR:UCB	38.28	180.2	6,898.2	2,201.8	9,100.0	3,885.3	2,209.1	1,910.7	6.73	NA	NA	NA	NA	(2,995.3)

Company	Ticker	FYE	Data as of	Margin Analysis			Enterprise Value/				P/E			Price to Book
				Gross Profit	EBITDA	EBIT	Sales	EBITDA (a)	EBIT (a)	Sales CYE	LTM	CYE	CYE+1	
Eisai Co., Ltd	TSE:4523	31-Mar	18-Oct	79.6%	21.6%	14.6%	1.4 x	6.5 x	9.6 x	NA	14.5 x	NA	NA	10.3 x
Elan Corp. plc	NYSE:ELN	31-Dec	18-Oct	50.3%	11.6%	5.7%	3.6 x	31.0 x	62.8 x	3.6 x	NM	NM	NM	46.0 x
Forest Laboratories Inc.	NYSE:FRX	31-Mar	18-Oct	78.1%	20.4%	18.7%	1.5 x	7.2 x	7.9 x	1.5 x	16.5 x	8.9 x	8.1 x	2.2 x
H. Lundbeck A/S	CPSE:LUN	31-Dec	18-Oct	81.0%	30.6%	24.4%	1.6 x	5.2 x	6.6 x	NA	11.2 x	NA	NA	18.4 x
King Pharmaceuticals Inc.	NYSE:KMG	31-Dec	18-Oct	63.8%	23.7%	10.4%	2.0 x	8.4 x	19.2 x	2.2 x	25.3 x	21.5 x	20.6 x	3.2 x
Shire plc	LSE:SHP	31-Dec	18-Oct	87.4%	32.7%	25.3%	4.2 x	12.8 x	16.5 x	4.0 x	31.7 x	17.7 x	15.3 x	NM
Stada Arzneimittel AG	DB:SAZ	31-Dec	18-Oct	47.8%	19.2%	14.1%	1.5 x	8.1 x	11.0 x	NA	13.7 x	NA	NA	NM
UCB SA	ENXTBR:UCB	31-Dec	18-Oct	66.4%	56.9%	49.2%	2.3 x	4.1 x	4.8 x	NA	5.7 x	NA	NA	NM

<b>Median</b>	<b>72.3%</b>	<b>22.6%</b>	<b>16.7%</b>	<b>1.8 x</b>	<b>7.2 x</b>	<b>9.6 x</b>	<b>2.9 x</b>	<b>14.5 x</b>	<b>17.7 x</b>	<b>15.3 x</b>	<b>10.3 x</b>
<b>Mean</b>	<b>69.3%</b>	<b>27.1%</b>	<b>20.3%</b>	<b>2.3 x</b>	<b>7.5 x</b>	<b>10.8 x</b>	<b>2.8 x</b>	<b>16.9 x</b>	<b>16.0 x</b>	<b>14.7 x</b>	<b>16.0 x</b>
<b>Min</b>	<b>47.8%</b>	<b>11.6%</b>	<b>5.7%</b>	<b>1.4 x</b>	<b>4.1 x</b>	<b>4.8 x</b>	<b>1.5 x</b>	<b>5.7 x</b>	<b>8.9 x</b>	<b>8.1 x</b>	<b>2.2 x</b>
<b>Max</b>	<b>87.4%</b>	<b>56.9%</b>	<b>49.2%</b>	<b>4.2 x</b>	<b>12.8 x</b>	<b>19.2 x</b>	<b>4.0 x</b>	<b>31.7 x</b>	<b>21.5 x</b>	<b>20.6 x</b>	<b>46.0 x</b>

\* All estimates from Capital IQ

NA - not available

NM - not meaningful

a) Elan is excluded from EV/EBITDA and EV/EBIT analysis

## Bourne Partners Overview

- Investment banking and strategic business development support services
- Healthcare focus
- Client segmentation
  - ❖ Specialty Pharmaceuticals
  - ❖ OTC/Nutraceutical
  - ❖ Medical Device
  - ❖ Healthcare services
  - ❖ Distribution
  - ❖ Biotechnology
- Over \$2.5 billion in debt and equity capital raised in the healthcare sector
- Over \$2.5 billion executed in financial advisory (M&A) assignments in the healthcare sector
- Since 2004, Bourne Partners has advised on deals in 8 different countries:
  - ❖ U.S., Germany, Canada, Ireland, Sweden, Denmark, Brazil, and Italy

## Where Bourne Adds Value

### M&A Specialist Group

- ❖ Concentrate on acquisition, sale and going private assignments
- ❖ Focus on \$25-\$250 million transactions or licensing collaborations with product sales expectations of \$20 million and above
- ❖ Strong private equity and venture capital relationships
- ❖ Focus on serving middle market companies
- ❖ Company and product M&A

### Depth of Resources & Relationships

- ❖ Significant industry relationships; access to key decision makers
- ❖ Deal team depth and experience
- ❖ Extensive international coverage
- ❖ Bankers and healthcare executives within the firm

### Experienced in Maximizing Value

- ❖ Directly relevant experience
- ❖ Professionally structured process
- ❖ Deal team staffing a proper mix of junior and senior resources
- ❖ Memorandum and material preparation of the highest quality
- ❖ Sensitive to confidentiality issues

### Healthcare Industry Expertise

- ❖ Healthcare focus
- ❖ Relationships with over 500 healthcare companies worldwide
- ❖ Dedicated industry research coverage
- ❖ Dedicated internal analyst coverage
- ❖ Significant transaction record

## Professionals to Contact

➤ Banks Bourne, Senior Managing Director

[BBourne@bourne-partners.com](mailto:BBourne@bourne-partners.com) | 704.714.8350

- ❖ Investment banking with Wachovia Securities, Inc.
- ❖ Founder and Managing Partner of Bourne Capital Partners, LLC
- ❖ B.A. – Business Management with distinction from North Carolina State University, MBA – Wake Forest University
- ❖ Member of Young Presidents Association (YPO)

➤ Jeremy Johnson, Director

[JJohnson@bourne-partners.com](mailto:JJohnson@bourne-partners.com) | 704.714.8351

- ❖ 10 years of M&A, licensing and private equity experience
- ❖ 9 years in healthcare
- ❖ Member of Licensing Executives Society
- ❖ Member of Georgetown University Board of Governors
- ❖ B.A. from Georgetown University

# Select Tombstones



**Desitin Arzneimittel GmbH**  
 Announces the license of European commercialization rights of sumatriptan DosePro™ from




*The undersigned served as exclusive financial advisor to Desitin Arzneimittel GmbH in the origination and structuring of this transaction*




*This announcement appears as a matter of record only*


**AZUR PHARMA**  
 Azur Pharma Limited  
 Announces the Acquisition of



Pharmelle LLC  
*The undersigned served as exclusive financial advisor to Azur Pharma Limited in the origination and structuring of the transaction*




*This announcement appears as a matter of record only*



BurnsAdler Pharmaceuticals, Inc.  
 Announces the license of Garacoll® from

**Innocoll**  
 Innocoll Pharmaceuticals Ltd.  
*The undersigned served as financial advisor to BurnsAdler Pharmaceuticals in the origination and structuring of this transaction*



*This announcement appears as a matter of record only*




CollMED Laboratories, Inc.  
 Bourne Partners announces the formation of CollMED Laboratories, Inc., a joint venture with Innocoll Pharmaceuticals Ltd. for the commercialization of Wound Care products in the United States

**Innocoll**  
 Innocoll Pharmaceuticals Ltd.  
*The undersigned served as financial advisor to Leimer Pharmaceuticals in the origination and structuring of this transaction*




*This announcement appears as a matter of record only*

**Sciele**  
 Pharma, Inc.  
 Sciele Pharma, Inc.  
 Strategic Alternatives Analysis  
*The undersigned performed a Commercial Market Assessment of the Women's Health Sector*




*This announcement appears as a matter of record only*



Desitin Arzneimittel GmbH  
 Announces the Sale of Orfiril® long to

BiofuturaFarma S.p.A.  
 (a division of Sigma-tau S.p.A.)  
*The undersigned served as financial advisor to Desitin Arzneimittel in the origination and structuring of this transaction*



*This announcement appears as a matter of record only*

**THERAMED**  
 Theramed Corporation  
 Announces the license of Sigmasporin® from



EMS Sigma Pharma Group  
*The undersigned served as financial advisor to Theramed Corporation in the origination and structuring of this transaction*



*This announcement appears as a matter of record only*



SJ Strategic Investments  
 Announces a private placement of 4,088,794 common shares in



Stellar Pharmaceuticals Inc.  
*The undersigned served as financial advisor to Leimer Pharmaceuticals in the origination and structuring of this transaction*



*This announcement appears as a matter of record only*