

# Pharmaceutical Therapeutic Categories Outlook

The \$355B worldwide pharmaceutical industry has terrific secular growth prospects, driven mostly by new products derived from rich R&D pipelines. New research tools for finding promising targets and strategies for reducing development time bolster the long-term outlook. These factors more than offset near-term uncertainties in the regulatory review process and debate on the need for prescription drug benefits. This comprehensive study forecasts trends in the major therapeutic drug categories through 2005. Each category is defined by therapeutic need, market size, growth outlook, major new compounds in development, and an assessment of individual company prospects. As shown below, the companies predicted to lead in “Market Share,” “Total Therapeutic Positions,” and “Leading Therapeutic Positions” are similar to last year. However, a new group of companies is poised for “Market Share Gain” through 2005. This analysis reaffirms our top picks in the group: **Bristol-Myers Squibb, Eli Lilly, Pfizer** and **Pharmacia**. We also like **Elan, Forest Labs** and **King Pharmaceuticals** in the mid-cap Rx segment.

## WHICH COMPANIES WILL LEAD INDUSTRY THROUGH 2005?

Market Share	Market Share Gain	Total Therapeutic Positions	Leading Therapeutic Positions
GlaxoSmithKline	Eli Lilly	Pfizer (12)	GlaxoSmithKline (4)
Pfizer	Novartis	Pharmacia (11)	American Home Products (3)
Merck	Amgen	GlaxoSmithKline (9)	Bristol-Myers Squibb (2)
Bristol-Myers Squibb	Johnson & Johnson	Johnson & Johnson (9)	Pfizer (2)
Aventis	American Home Products	Merck (9)	

## SG COWEN PHARMACEUTICAL UNIVERSE

Company	Symbol	Stock Rating	9/27/01 Price	EPS		P/E	
				2001E	2002E	2001E	2002E
Abbott Laboratories	ABT	1	\$50	\$1.89	\$2.26	26X	22X
American Home Products	AHP	2	57	2.18	2.60	26	22
Amgen	AMGN	2	57	1.18	1.35	48	42
Bristol-Myers Squibb	BMY	1	53	2.39	2.60	22	20
Elan	ELN	2	48	1.90	2.30	25	21
Eli Lilly	LLY	1	79	2.80	2.85	28	28
Forest Labs	FRX	1	71	1.60	1.89	44	38
Genentech	DNA	2	42	0.75	0.95	56	44
GlaxoSmithKline	GSK	2	53	2.11	2.40	25	22
Johnson & Johnson	JNJ	2	54	1.93	2.20	28	25
King Pharmaceuticals	KG	1	42	1.01	1.35	41	31
Merck	MRK	2	63	3.15	3.45	20	18
Pfizer	PFE	1	39	1.30	1.60	30	24
Pharmacia	PHA	1	39	1.74	2.06	22	19
Schering-Plough	SGP	2	35	1.65	1.85	21	19

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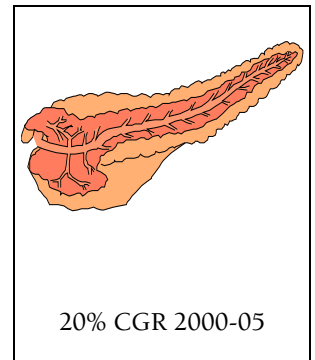
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## Diabetes

### DEFINITION/ BACKDROP

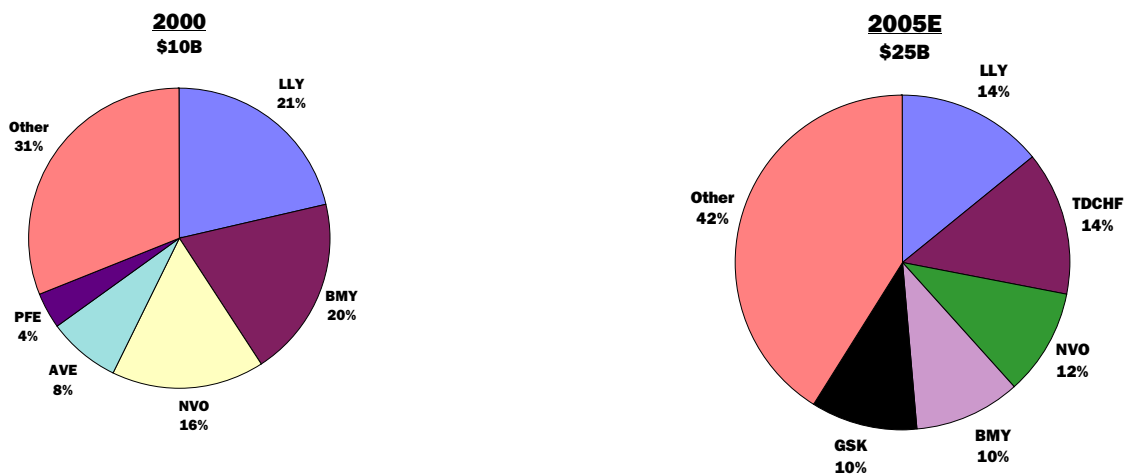
#### □ Diabetes: An Under-Treated And Widespread Disease

Diabetes mellitus is characterized by abnormalities of glucose production and utilization, which, in turn, are caused by abnormalities of pancreatic insulin release. If left unregulated, abnormally high glucose levels over time result in organ damage involving the nervous system, kidneys, eyes, and circulatory system. An estimated 5-6% of the U.S. population, or roughly 16MM people, suffer from diabetes, with approximately 8MM undiagnosed. About 90% of patients with diabetes have the adult onset type, known as Type 2 (non-insulin dependent). In Type 2 diabetes, often both the secretion of insulin from the pancreas and the action of insulin on tissues such as fat and muscle are abnormal. Patients continue to produce insulin, sometimes in excessive amounts, but the ability to use the insulin and the amount secreted deteriorates over time. Many patients with Type 2 diabetes are obese and this adversely affects insulin's ability to work. Ten percent of diabetics have Type 1 diabetes, which is a state of absolute insulin deficiency stemming from autoimmune destruction of the insulin-producing cells in the pancreas. Patients with Type 1 diabetes produce little or no insulin and are dependent on daily insulin injections for survival. A small percentage of diabetics who appear to have Type 2 diabetes actually have a slowly progressing form of Type 1 and require insulin therapy. Many patients with Type 2 diabetes also require insulin treatment later in the course of their disease. Long-term complications caused by diabetes include decreased vision/blindness (diabetic retinopathy), reduced kidney function/failure (diabetic nephropathy), nerve damage (diabetic neuropathy) and circulatory disorders.



### Diabetes Category Market Share By \$ Sales

### PARTICIPANTS

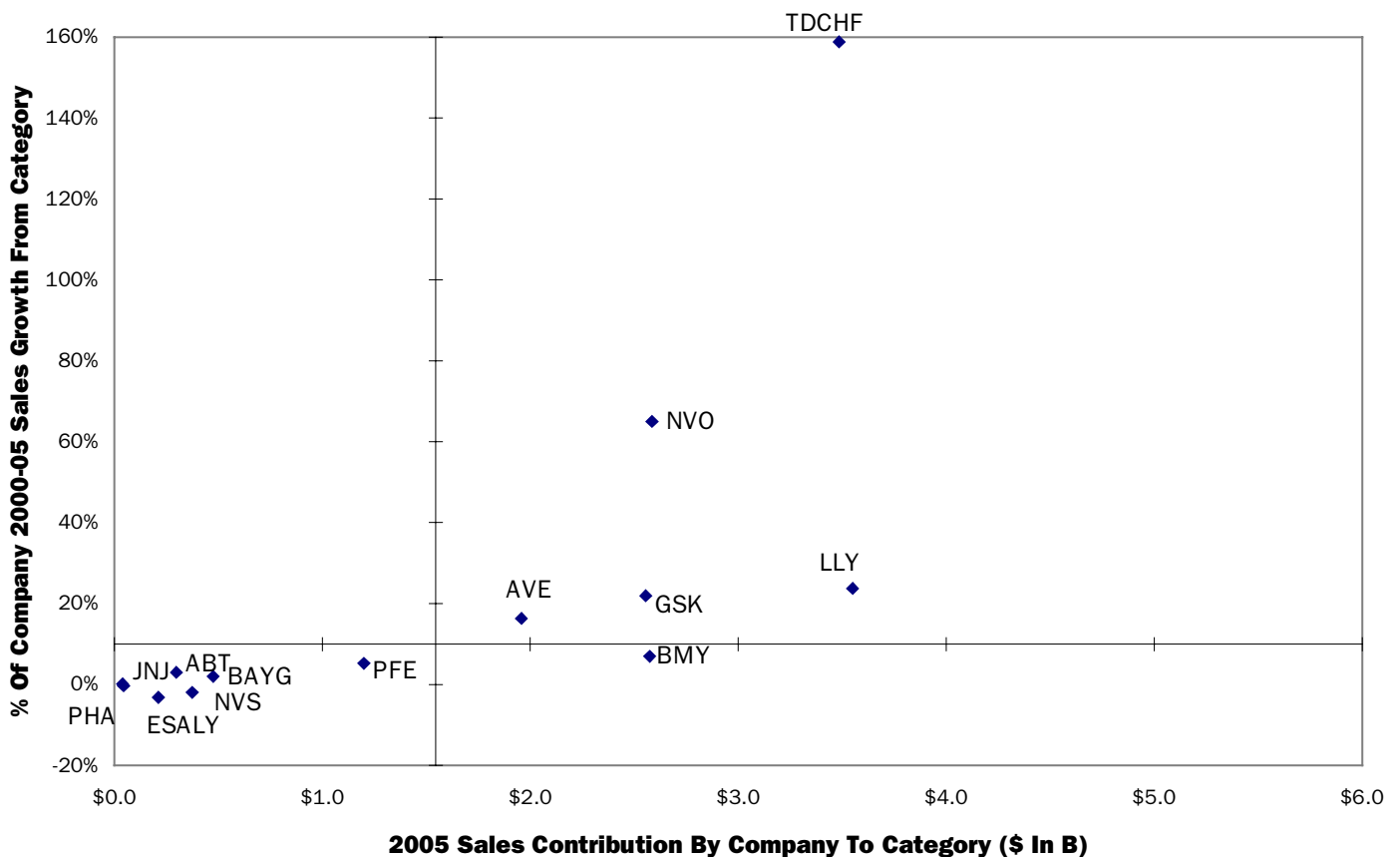


In 2000, Eli Lilly and Bristol-Myers Squibb dominated the diabetes category with 21% and 20% dollar shares, respectively, via their insulin and oral diabetes franchises, respectively. Lilly should sustain its leadership through 2005, and Takeda could move into second place, based on the anticipated success of Actos. Novo Nordisk should share second place. Overall, we look for the market to more than double by 2005.

**MAJOR  
TRENDS &  
ISSUES**

- Insulin will remain a mainstay therapy, and more than double in sales through 2005. Eli Lilly, Novo Nordisk, and Aventis will benefit.
- Oral agents, particularly the glitazones, have big potential, and could delay or avoid the need for insulin therapy. Sales of glitazones could more than triple by 2005; GlaxoSmithKline/Bristol-Myers Squibb's Avandia and Takeda/Eli Lilly's Actos will benefit. Growth of new versions of Bristol-Myers Squibb's Glucophage will be clipped by rollout of generics.
- Novel insulin delivery methods, particularly inhaled formulations, will encourage use of insulin and increase the amount of insulin sold. Inhale Therapeutic Systems/Pfizer/Aventis, Aradigm/Novo Nordisk, and Alkermes/AIR/Eli Lilly are positioning to benefit.
- Diabetes complication products have very large potential, assuming ongoing clinical work shows them to be effective and safe. Eli Lilly leads here.
- Our scatter plot shows that through 2005, Eli Lilly, Novo Nordisk, and Takeda should dominate the diabetes segment, and this category is critical to their growth.

**Diabetes**



**ESTIMATED WORLDWIDE MARKET FOR DIABETES/METABOLIC DRUGS BY CLASS (\$MM)**

Drug Class	2000		2005P		\$	NRx	Comments
	Market	% Total	Market	% Total	'00-05 CGR	'87-00 CGR	
Glitazones	\$2,348	23%	\$9,035	36%	31%	NM	- BMY/GSK's Avandia, LLY/Takeda's Actos
Insulins	3,242	32%	6,863	27%	16%	5%	- LLY and NVO dominate; includes inhaled insulin
Sulfonylureas	789	8%	1,110	4%	7%	NA	- Various therapies
Thyroid Drugs	663	6%	569	2%	-3%	25%	- ABT's Synthroid, KG's LevoxyI
Other Oral Agents	3,185	31%	7,636	30%	19%	7%	- Glucophage/metformin; other
<b>Total Market</b>	<b>\$10,228</b>	<b>100%</b>	<b>\$25,213</b>	<b>100%</b>	<b>20%</b>	<b>10%</b>	<b>- Driven by the glitazones</b>

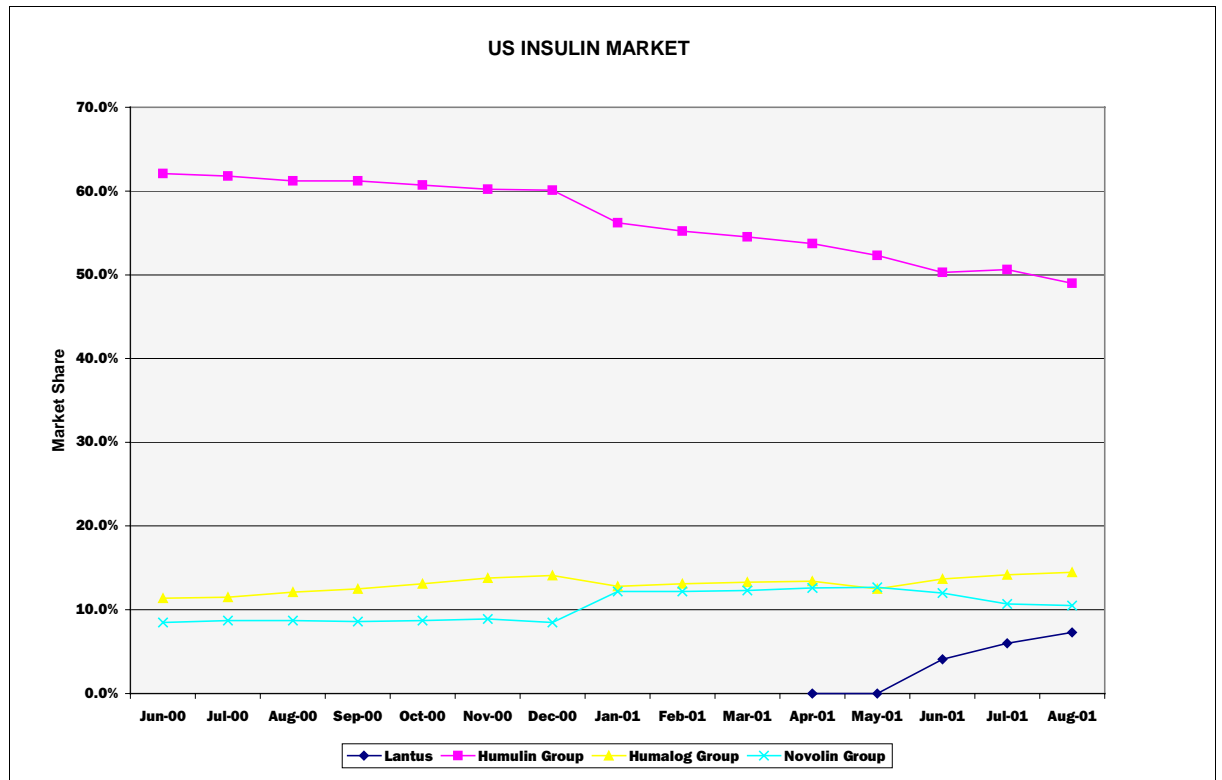
**DETAILED DISCUSSION**

**□ Insulin To Remain A Mainstay Therapy**

There are an estimated 11-12MM Type 1 diabetics in the world, and many are on regular insulin therapy. In addition, approximately 40-50% of patients with Type 2 diabetes in the U.S. require insulin at some point. When they do, they require higher doses of insulin than patients with Type 1 diabetes because of their resistance to its action. Given the enormous population of Type 2 diabetics worldwide (90MM+), the market for insulin is large and should continue to grow, even with the availability of new oral agents that may delay the need for or amount of insulin required. All told, the insulin market totaled \$3.2B in 2000 and is dominated by Eli Lilly and Novo Nordisk. We anticipate increased use of insulin in combination regimens and in inhaled formulations. Thus, we still forecast 16% sales growth in the insulin market over 2000-2005, driven by continued patient growth, the emergence of newer premium-priced formulations, and increased units as lower-bioavailability, inhaled formulations grow.

- **Short-Acting Insulin Analogues Offer Important Benefits** – Short-acting insulin analogues are very important and useful because, when used properly, they produce less hypoglycemia during the nighttime hours, can be used conveniently immediately before meals, and assist treatment of children, but adoption likely will remain slow. This is due to the fact that most diabetics are treated by general practitioners and not endocrinologists and diabetologists. General practitioners are less likely to prescribe short-acting insulin analogues given that they are difficult to use to achieve tight glucose control. Nonetheless, they offer substantial quality of life enhancement. Eli Lilly's Humalog sales are estimated at \$620MM in 2001 and \$1,300MM in 2005. Novo Nordisk's rapidly-acting insulin has been launched in Europe, and U.S. launch of Novolog is expected in Q4:01. Aventis is believed to have a short-acting insulin in Phase II. Premixed insulins are viewed cautiously by doctors because they eliminate flexibility and are easy to prescribe inappropriately. Despite this concern, Eli Lilly's premixed insulin, which utilizes Humalog, has enjoyed a spectacular launch. Premixed insulins are more likely to be used in Type 2 than in Type 1 diabetes.
- **Aventis' Lantus Widely Accepted In The U.S. And Europe** - Our physician consultants have enthusiastically embraced Aventis' Lantus (insulin glargine), a new long-acting insulin differentiated by its steady 24-hour pharmacokinetic profile. The efficacy benefits provided by Lantus (dosed via a once-daily subcutaneous injection) in combination with mealtime fast-acting insulin injections have raised the benchmark for glucose control in Type 1 diabetics. Our consultants believe that, as Lantus use expands, more patients will achieve

HbA<sub>1c</sub> targets of 7.0% or less. We peg Lantus sales at \$230MM in 2001 and \$635MM in 2005.



Source: IMS America

## □ Oral Drugs Are Changing Landscape Of Diabetes

Oral agents have enhanced the ability to control the symptoms of diabetes and to improve patients' quality of life. Bristol-Myers Squibb's Glucophage, which currently dominates the oral antihyperglycemic market, works by reducing the amount of glucose the liver excretes. Glucophage sales are estimated at \$1,575MM (-9%) in 2001, declining to \$25MM in 2005, due to generic competition. Exclusivity for Glucophage expired in 9/2000, and we expect generics to be approved imminently. New formulations of Glucophage (e.g., Glucovance and Glucophage XR) should support the franchise; switching from Glucophage to the new formulations has gone well. Glucovance sales are projected at \$435MM in 2001 and \$1.5B in 2005, and Glucophage XR sales are forecast at \$350MM in 2001 and \$1,050MM in 2005. All told, Glucophage franchise sales are pegged at \$2,360MM (+25%) in 2001 and \$2,575MM in 2005. GlaxoSmithKline's Avandia is highly potent, and produces substantial reductions in fasting blood glucose at lower doses. Avandia's sales are estimated at \$1,225MM in 2001, rising to \$2,375MM in 2005. Eli Lilly's Actos, licensed from Takeda for the U.S. and certain other world markets, is similar to Avandia in terms of effectiveness in lowering HbA<sub>1c</sub>. We peg worldwide sales of Actos at \$1,400MM in 2001 and \$3,115MM in 2005. Novo co-markets Actos in Japan, and Takeda will market Actos alone in major European markets. GlaxoSmithKline, J&J, Merck, Novo Nordisk, and Pharmacia have follow-on insulin sensitizers in development.

- **Newer Glitazones Leave Room For Improvement** - Our physician consultants note that Actos and Avandia have not met initial expectations, possibly due to less robust efficacy compared with Rezulin and side effects, most notably edema and LDL cholesterol elevations. In August, Actos and Avandia had 8.3% and 9.4% new prescription share of the

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