Center for Drug Evaluation and Research
Food and Drug Administration
U.S. Department of Health and Human Services

Impact
Innovation
Predictability
Access

2012

NOVEL NEW DRUGS SUMMARY

JANUARY, 2013

CDER'S 2012 NMEs

39 novel new drugs in CY 2012:
In Calendar Year 2012, FDA's Center for Drug Evaluation and Research (CDER) approved 39 novel new medicines, known as new molecular entities (NMEs).* This includes applications for both New Drug Applications (NDAs) and Biologics License Applications (BLAs).

The blue bars in the chart to the right indicate the number of NMEs approved by CDER in each year of the past decade. CDER approved 39 NMEs in 2012, the highest total for this period. From 2003 through 2011 CDER has averaged about 24 NME approvals per year. The 2012 total is 63% higher than this previous nine year average.

In 2012 CDER approved 39 NME's

FDA is encouraged by this increase; however, it is too early to tell if it reflects a long-term trend toward increasing numbers of product approvals.

Applications for new approvals remain steady

Despite a higher number of NME approvals for the past two years, the number of applications CDER has been receiving for NMEs has not been consistently and significantly increasing.

The green portion of th graph to the right indicate the number of new NDA and BLA applications for NMEs CDER has filed over the last ten years. From 2003 through 2011, CDER filed an average of about 32 applications for NMEs per year. Although all applications submitted in 2012 were not accepted for filing as of 12/31/12, CDER projects about 41 for 2012, roughly 28% higher than the 2003-2011 average of 32.

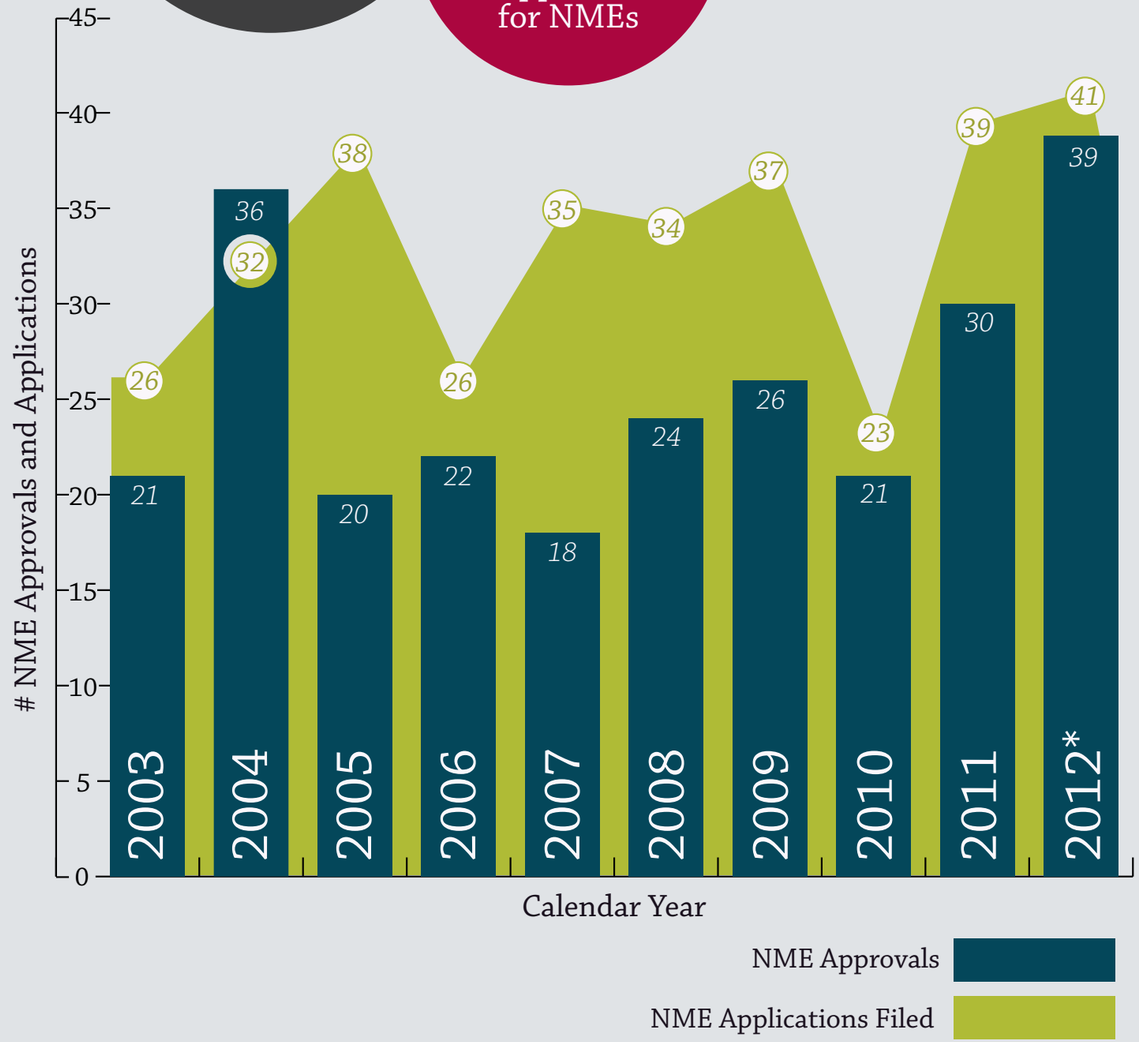
Forty-one filings of new NME applications in CY 2012 would be the most this decade, another positive sign. However, the recent increase in NME filings is not enough to predict a trend toward sustained growth. FDA cannot expect a continuing upward trend for NME approvals until a sustained increase in the number of applications for NMEs submitted for approval is also demonstrated.

The NMEs of 2012: see pages 14 & 15 for what these drugs are used for.							
Amyvid	Aubagio	Belviq	Bosulif	choline C-11	Cometriq	Elelyso	Eliquis
Erivedge	Fulyzaq	Fycompa	Gattex	Iclusig	Inlyta	Jetrea	Juxtapid
Kalydeco	Kyprolis	Linzess	Myrbetriq	Neutroval	Omontys	Perjeta	Picato
Prepopik	raxibacumab	Signifor	Sirturo	Stendra	Stivarga	Stribild	Surfaxin
Synribo	Tudorza Pressair	Voraxaze	Xeljanz	Xtandi	Zaltrap	Zioptan	

*For more details about the individual NMEs, see pages 14 & 15.

39 NMEs approved in CY 2012 is the highest total approved by CDER in more than a decade

From 2003 through 2011 CDER filed an average of about 32 applications for NMEs



*The final number of NME Applications filed in 2012 is projected, pending final validation of the data and dependent on the outcome of applications submitted in late 2012.

IMPACT

Impact on Public Health

The 39 new molecular entities approved in CY 2012 represent the most approved by CDER in more than a decade, and many of these NMEs are notable for their potential positive impact and unique contributions to quality care and public health.

First-in-Class

More than half (51%) of the NMEs approved in CY 2012 (20 of 39) were identified by FDA as First-in-Class, meaning drugs which, for example, use a new and unique mechanism of action for treating a medical condition. First-in-Class is one indicator of the innovative nature of a drug and 51% First-in-Class approval rate suggests that the group of CY 2012 NMEs is a field of highly innovative new products.

Particularly noteworthy First-in-Class products include Amyvid, the first brain scan imaging agent to help rule out Alzheimer's disease as a cause of mental decline, Erivedge, the first FDA-approved drug for late-stage basal cell cancer, the most common form of skin cancer, Fulyzaq, the first drug approved for HIV-associated diarrhea, Kalydeco, the first cystic fibrosis drug to target the gene defect underlying the disease, Sirturo, the first of a new class of drugs to treat multi-drug-resistant pulmonary tuberculosis, and Voraxaze, an important new treatment option for cancer patients to help them avoid the toxic effects of the drug methotrexate.

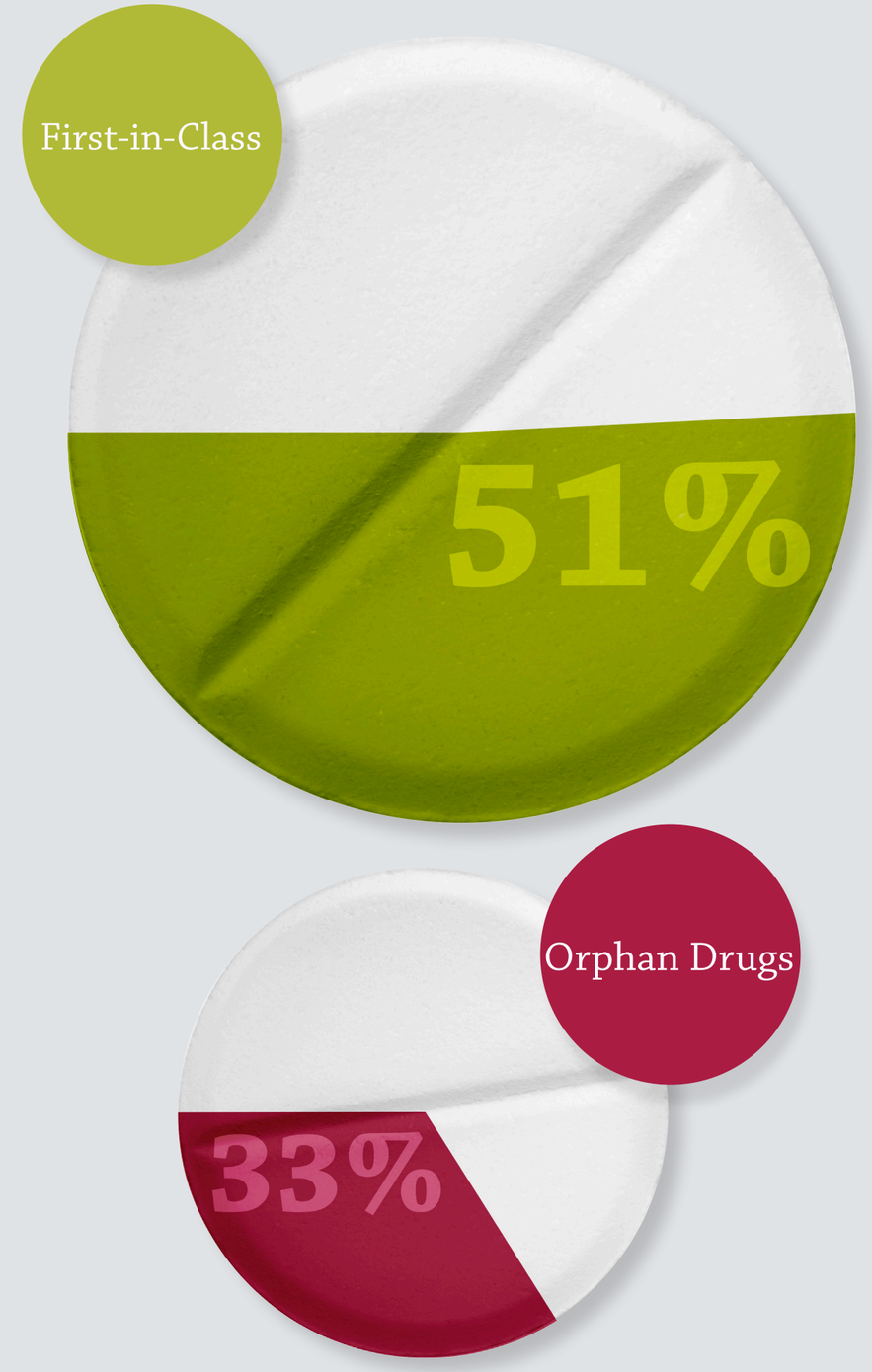
- Amyvid
- Aubagio
- Belviq
- choline C-11
- Cometriq
- Erivedge
- Fulyzaq
- Fycompa
- Gattex
- Jetrea
- Juxtapid
- Kalydeco
- Linzess
- Myrbetriq
- Picato
- raxibacumab
- Signifor
- Sirturo
- Synribo
- Voraxaze

Orphan Drugs

Thirteen of the 39 NMEs of CY 2012 (33%) were approved to treat rare or "orphan" diseases that affect 200,000 or fewer Americans. This is significant because patients with rare diseases often have few or no drug treatment options.

The rare disease chronic myelogenous leukemia now has three new treatment options (Bosulif, Iclusig, and Synribo). Other noteworthy examples of rare diseases that now have new effective treatment options include homozygous hypercholesterolemia (Juxtapid), short bowel syndrome (Gattex), and Cushing's disease (Signifor).

- Bosulif
- Cometriq
- Elelyso
- Gattex
- Iclusig
- Juxtapid
- Kalydeco
- Kyprolis
- raxibacumab
- Signifor
- Sirturo
- Synribo
- Voraxaze



For more details about the individual NMEs, see pages 14 & 15.

Notable NMEs of 2012: An exceptional year for quality

In addition to the noteworthy examples of innovative First-in-Class and "Orphan" new products mentioned on page 4 and highlighted on these pages, the 39 NMEs approved in CY 2012 also include the following notable new products: Elelyso, for Gaucher disease, Eliquis, an anticoagulant to help prevent a type of blood clot known as a venous thromboembolism, Jetrea, to treat an eye condition called symptomatic vitreomacular adhesion, raxibacumab, to treat inhalational anthrax, and Stribild, a once-a-day combination pill to treat HIV-1 infection in adults who have never been treated for HIV infection.

Kalydeco: to treat cystic fibrosis

Signifor: to treat Cushing's disease

Fulyzaq: to treat HIV-associated diarrhea

Erivedge: to treat late-stage basal cell cancer

Amyvid: to help rule out Alzheimer's disease as a cause of mental decline

Gattex: to treat short bowel syndrome

Juxtapid: to treat homozygous hypercholestertolemia

Voraxaze: to help avoid toxic effects of methotrexate

Sirturo: to treat multi-drug-resistant pulmonary tuberculosis

Bosulif, Iclusig, & Synribo: to treat chronic myelogenous leukemia

Other notable NME approvals of CY 2012 include innovative drugs to treat a variety of cancers, such as, Perjeta, to treat a specific form of late-stage breast cancer, Stivarga, to treat patients with colorectal cancer that has progressed after treatment and spread to other parts of the body and Xtandi for late-stage prostate cancer.

For more details about the individual NMEs, see pages 14 & 15.

INNOVATION

Innovative methods for expediting NMEs to market

Many of the 39 NMEs of 2012 approved by CDER are notable for the regulatory methods CDER used to expedite the development and approval process. From time of submission to their approval dates, some drugs were under review for only a few months prior to approval. Particularly noteworthy examples of drugs approved rapidly are Iclusig, approved in 2.6 months, Xtandi, approved in 3.3 months, Kalydeco, 3.5 months, Erivedge, 4.7 months, and Stivarga, 5.0 months.

Fast Track

Fourteen of the 39 NMEs approved in 2012 (36%) were designated by CDER as Fast Track, meaning drugs with the potential to address unmet medical needs. Fast Track speeds new drug development and review; for instance, by increasing the level of communication FDA allocates to developers and by enabling developers to use a "rolling review" process such that CDER can review portions of an application ahead of the submission of the full application.

- Cometriq
- Elelyso
- Fulyzaq
- Iclusig
- Inlyta
- Kalydeco
- Kyprolis
- raxibacumab
- Sirturo
- Stivarga
- Stribild
- Surfaxin
- Voraxaze
- Xtandi

Priority Review

Sixteen of the 39 NMEs approved in 2012 (41%) were designated Priority Review, in which CDER determines the drug to potentially provide a significant advance in medical care and sets a target to review the drug within six months instead of the standard 10 months.

- Amyvid
- choline C-11
- Cometriq
- Eliquis
- Erivedge
- Fulyzaq
- Iclusig
- Jetrea
- Kalydeco
- Perjeta
- raxibacumab
- Sirturo
- Stivarga
- Voraxaze
- Xtandi
- Zaltrap

Accelerated Approval

Four of the 39 NMEs approved in 2012 (10%) were approved under FDA's Accelerated Approval program, which allows early approval of a drug for serious or life-threatening illness that offers a benefit over current treatments. This approval is based on a "surrogate endpoint" (e.g., a laboratory measure) or other clinical measure that FDA considers reasonably likely to predict clinical benefit. After this approval, the drug must undergo additional testing to confirm that benefit; this speeds the availability of the drug.

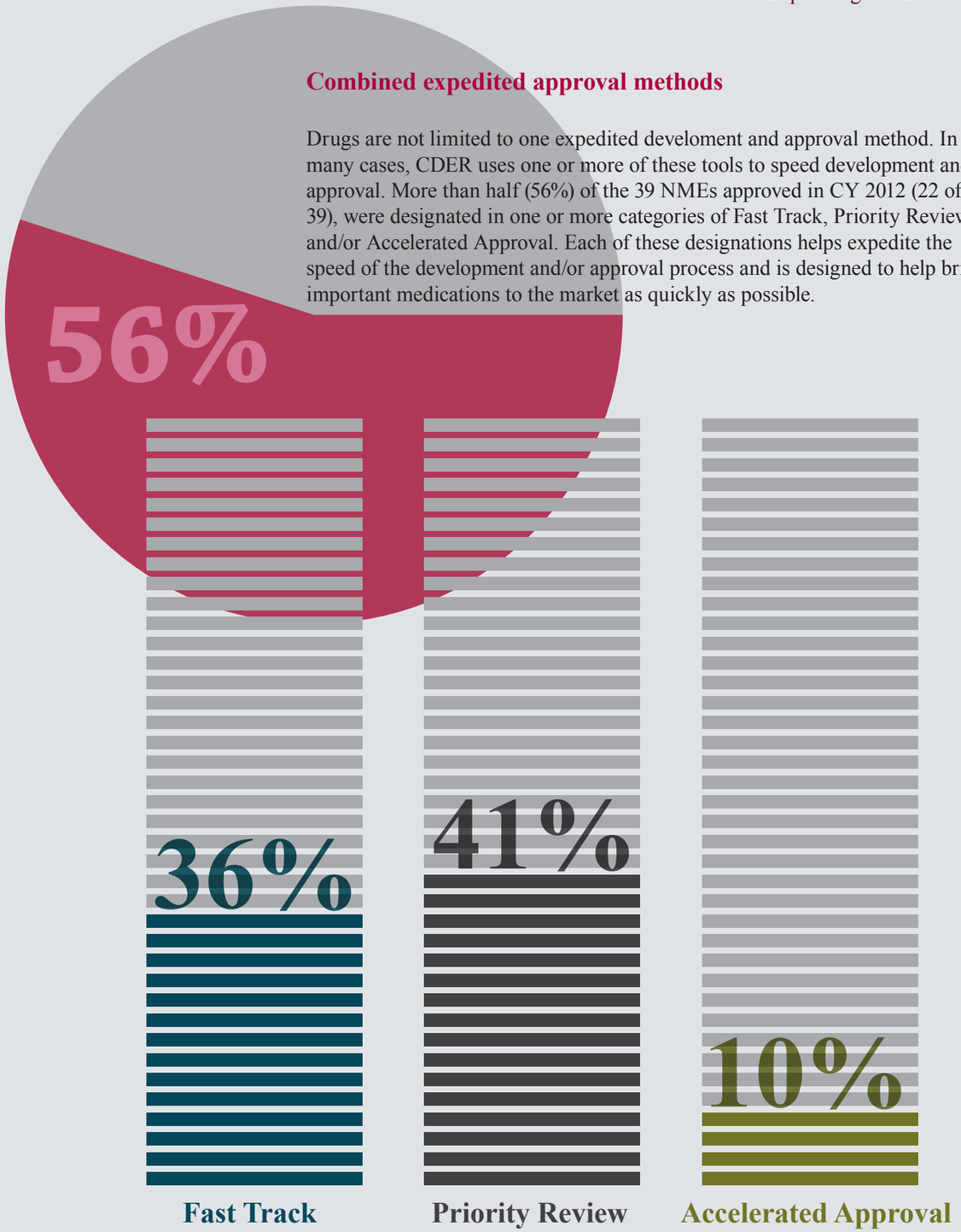
- Iclusig
- Kyprolis
- Sirturo
- Synribo

For more details about the individual NMEs, see pages 14 & 15.

Innovative Methods for Expediting NMEs to Market

Combined expedited approval methods

Drugs are not limited to one expedited develoment and approval method. In many cases, CDER uses one or more of these tools to speed development and approval. More than half (56%) of the 39 NMEs approved in CY 2012 (22 of 39), were designated in one or more categories of Fast Track, Priority Review, and/or Accelerated Approval. Each of these designations helps expedite the speed of the development and/or approval process and is designed to help bring important medications to the market as quickly as possible.



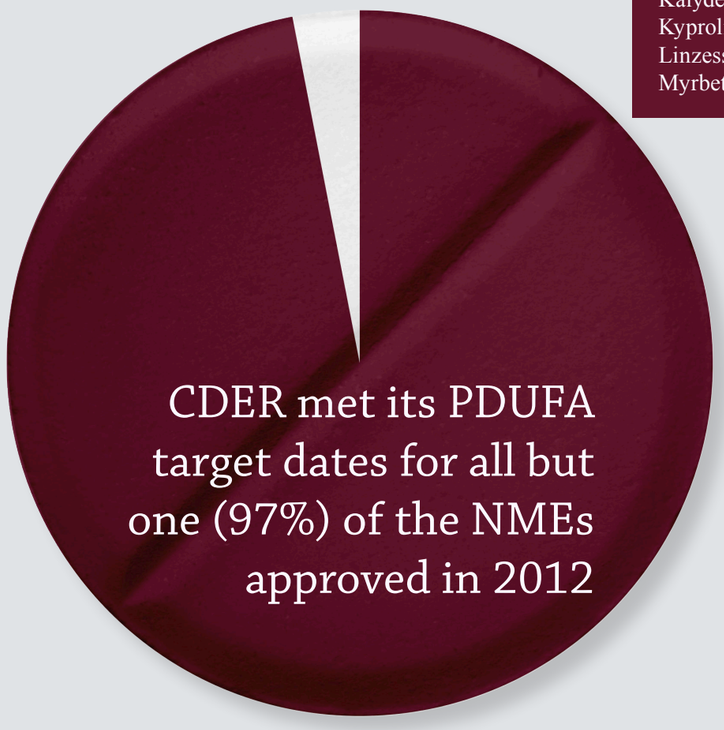
PREDICTABILITY

PDUFA Target Dates Met

Under the Prescription Drug User Fee Act (PDUFA), sponsors are assessed user fees that provide FDA with the additional resources needed to meet performance goals.

Throughout the year, CDER was able to meet or exceed PDUFA target dates for application review, agreed to with the pharmaceutical industry and approved by Congress. CDER met its PDUFA target dates for all but one (97%) of the NMEs approved in CY 2012.

- Amyvid
- Aubagio
- Belviq
- Bosulif
- choline C-11
- Cometriq
- Elelyso
- Eliquis
- Erivedge
- Fycompa
- Gattex
- Iclusig
- Inlyta
- Jetrea
- Juxtapid
- Kalydeco
- Kyprolis
- Linzess
- Myrbetriq
- Neutroval
- Omontys
- Perjeta
- Picato
- Prepopik
- raxibacumab
- Signifor
- Sirturo
- Stendra
- Stivarga
- Stribild
- Surfaxin
- Synribo
- Tudorza Pressair
- Voraxaze
- Xeljanz
- Xtandi
- Zaltrap
- Zioptan



For more details about the individual NMEs, see pages 14 & 15.

ACCESS

First Cycle Approval

- Aubagio
- Bosulif
- choline C-11
- Cometriq
- Erivedge
- Fulyzaq
- Fycompa
- Gattex
- Iclusig
- Inlyta
- Jetrea
- Juxtapid
- Kalydeco
- Kyprolis
- Linzess
- Myrbetriq
- Omontys
- Perjeta
- Picato
- Prepopik
- Signifor
- Sirturo
- Stendra
- Stivarga
- Stribild
- Synribo
- Tudorza Pressair
- Voraxaze
- Xeljanz
- Xtandi
- Zaltrap

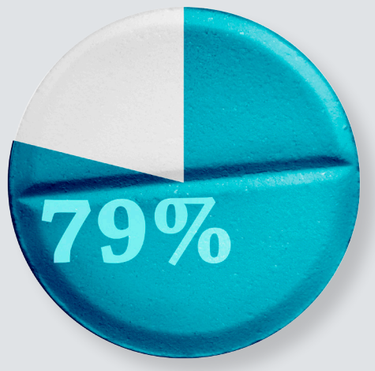
CDER approved most drugs (31 of 39) on the “first cycle” of review (79%), meaning without requests for additional information that would delay approval and lead to another cycle of review.

13 of the First Cycle Approvals are also designated as Priority Review drugs. This is particularly important because Priority Review drugs have the potential to serve as significant medical advances in health care.

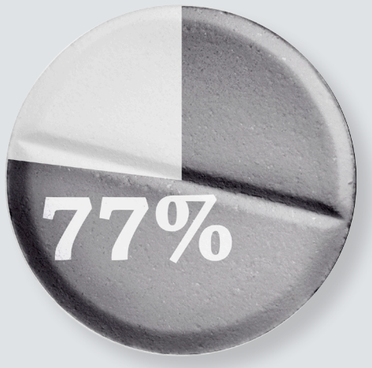
Approval in U.S. before Other Countries

- Amyvid
- Aubagio
- Belviq
- Bosulif
- choline C-11
- Cometriq
- Elelyso
- Erivedge
- Fulyzaq
- Iclusig
- Inlyta
- Jetrea
- Juxtapid
- Kalydeco
- Kyprolis
- Linzess
- Omontys
- Perjeta
- Picato
- raxibacumab
- Sirturo
- Stivarga
- Stribild
- Surfaxin
- Synribo
- Tudorza Pressair
- Voraxaze
- Xeljanz
- Xtandi
- Zaltrap

Comparing approval to other countries offers another measure of approval efficiency. Although regulatory processes differ widely between FDA and those of regulatory agencies in other countries, over three-quarters (77%) of the NMEs approved in CY 2012 (30 of 39) were approved first in the U.S. before any other country.



First Cycle Approval



First Approved in U.S.

OVERVIEW

This document represents a broad overview of CDER approvals of new molecular entities (NMEs) for calendar year 2012.

Although it is encouraging to see that the 39 NMEs approved in 2012 represent the highest total in more than a decade, the numbers have only substantially increased over the past two years, not long enough to establish a predictable trend. A continuing upward trend for the annual number of CDER's NME approvals necessarily relies upon a corresponding upward trend in the number of applications submitted for approval. Over the past decade, submissions for NMEs by the pharmaceutical and biotechnology industry have not been increasing. In other words, over time, CDER can only approve a number of NMEs proportional to the number of applications for NMEs it receives.

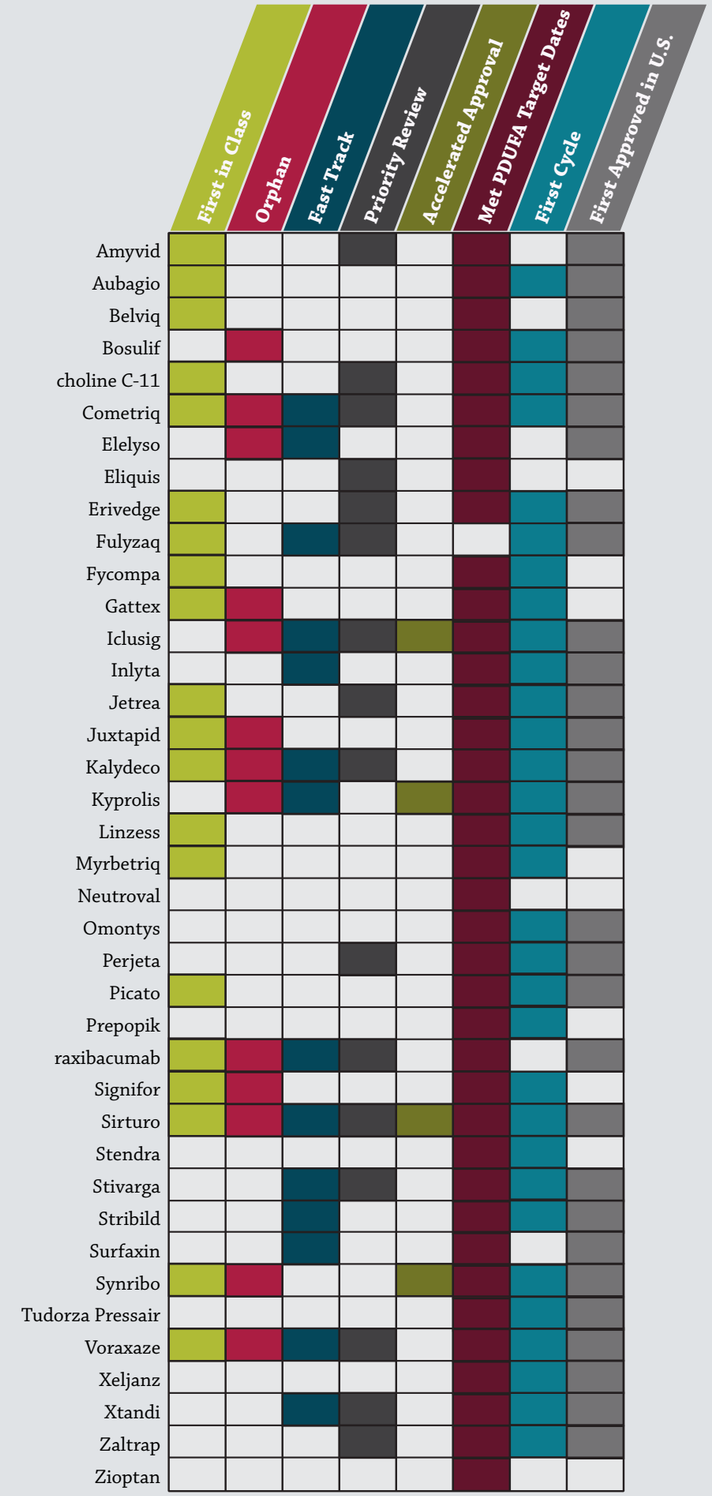
More important than the quantity of new drugs approved in 2012, is the quality of the new drugs the pharmaceutical industry has developed and the important new roles these drugs are serving to advance medical care.

More important than the quantity of new drugs approved by CDER in CY 2012, is the quality of the new drugs and the important new roles they are serving to advance medical care.

Also noteworthy is the efficiency with which most of these drugs were reviewed and approved. CDER used a variety of "expedited development and approval" regulatory tools to speed these drugs to market.

In all cases, while striving for efficiency of review and approval of applications for new drugs, CDER does not compromise its standards for demonstration of effectiveness and safety in the process.

For more details about the individual NMEs, see pages 14 & 15.



DRUG DESIGNATION SUMMARY

First-in-Class
Drugs with a new and unique mechanism for treating a medical condition

Orphan Drugs
Drugs approved for small populations of patients with rare diseases

Fast Track
Drugs that can treat unmet medical needs

Priority Review
Drugs with a target review of 6 months instead of 10 months

Accelerated Approval
Early approval based on markers that predict a reasonable benefit, with more testing to confirm clinical benefit after approval

PDUFA Target Dates
Drugs that met the Prescription Drug User Fee Act target dates for review

First Cycle
Drugs that were approved without request for additional information that would delay approval and lead to another cycle of review

First Approved in U.S.
Drugs that were approved first in the U.S. before any other country worldwide

THE NMES OF 2012

Drug Name	Active Ingredient	Date	What it's used for
Voraxaze	glucarpidase	1/17	To treat patients with toxic levels of methotrexate in their blood due to kidney failure.
Picato	ingenol mebutate	1/23	For the topical treatment of actinic keratosis.
Inlyta	axitinib	1/27	To treat patients with advanced kidney cancer (renal cell carcinoma) who have not responded to another drug for this type of cancer.
Erivedge	vismodegib	1/30	To treat adult patients with basal cell carcinoma, the most common type of skin cancer.
Kalydeco	ivacaftor	1/31	For the treatment of a rare form of cystic fibrosis (CF) in patients ages 6 years and older who have the specific G551D mutation in the Cystic Fibrosis Transmembrane Regulator (CFTR) gene.
Zioptan	tafluprost	2/10	For reducing elevated intraocular pressure in patients with open-angle glaucoma or ocular hypertension.
Surfaxin	lucinactant	3/6	For the prevention of respiratory distress syndrome (RDS), a breathing disorder that affects premature infants.
Omontys	peginesatide	3/27	To treat anemia, a condition in which the body does not have enough healthy red blood cells, in adult dialysis patients who have chronic kidney disease (CKD).
Amyvid	Florbetapir F 18	4/6	Used as a radioactive diagnostic agent for Positron Emission Tomography (PET) imaging of the brain to estimate β-amyloid neuritic plaque density in adult patients with cognitive impairment who are being evaluated for Alzheimer's Disease (AD) and other causes of cognitive decline.
Stendra	avanafil	4/27	To treat erectile dysfunction.
Elelyso	taliglucerase alfa	5/1	For long-term enzyme replacement therapy to treat a form of Gaucher disease, a rare genetic disorder
Perjeta	pertuzumab	6/8	To treat patients with HER2-positive late-stage (metastatic) breast cancer.
Belviq	lorcaserin hydrochloride	6/27	For chronic weight management.
Myrbetriq	mirabegron	6/28	To treat adults with overactive bladder.
Prepopik	sodium picosulfate, magnesium oxide and citric acid	7/16	To help cleanse the colon in adults preparing for colonoscopy.
Kyprolis	carfilzomib	7/20	To treat patients with multiple myeloma who have received at least two prior therapies, including treatment with Velcade (bortezomib) and an immunomodulatory.
Tudorza Pressair	aclidinium bromide	7/23	For the long-term maintenance treatment of bronchospasm associated with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and emphysema.
Zaltrap	ziv-aflibercept	8/3	For use in combination with a FOLFIRI (folinic acid, fluorouracil and irinotecan) chemotherapy regimen to treat adults with colorectal cancer.
Stribild	elvitegravir, cobicistat, emtricitabine, tenofovir disoproxil fumarate	8/27	A once-a-day combination pill to treat HIV-1 infection in adults who have never been treated for HIV infection.
Neutroval	tbo-filgrastim	8/29	To reduce the time certain patients receiving cancer chemotherapy experience severe neutropenia, a decrease in infection-fighting white blood cells called neutrophils.
Linzess	linaclotide	8/30	To treat chronic idiopathic constipation and to treat irritable bowel syndrome with constipation (IBS-C) in adults.
Xtandi	enzalutamide	8/31	To treat men with late-stage (metastatic) castration-resistant prostate cancer that has spread or recurred, even with medical or surgical therapy to minimize testosterone.
Bosulif	bosutinib	9/4	To treat chronic myelogenous leukemia (CML), a blood and bone marrow disease that usually affects older adults.
Aubagio	teriflunomide	9/12	For the treatment of adults with relapsing forms of multiple sclerosis.
Choline C 11 Injection	Choline C 11 Injection	9/12	A Positron Emission Tomography (PET) imaging agent used to help detect recurrent prostate cancer.
Stivarga	regorafenib	9/27	To treat patients with colorectal cancer that has progressed after treatment and spread to other parts of the body (metastatic).
Jetrea	ocriplasmin	10/17	To treat an eye condition called symptomatic vitreomacular adhesion (VMA).
Fycompa	perampanel	10/22	To treat partial onset seizures in patients with epilepsy ages 12 years and older.
Synribo	omacetaxine mepesuccinate	10/26	To treat adults with chronic myelogenous leukemia (CML), a blood and bone marrow disease.
Xeljanz	tofacitinib	11/6	To treat adults with moderately to severely active rheumatoid arthritis (RA) who have had an inadequate response to, or who are intolerant of, methotrexate.
Cometriq	cabozantinib	11/29	To treat medullary thyroid cancer that has spread to other parts of the body (metastasized).
Iclusig	ponatinib	12/14	To treat adults with chronic myeloid leukemia (CML) and Philadelphia chromosome positive acute lymphoblastic leukemia (Ph+ ALL), two rare blood and bone marrow diseases.
raxibacumab	raxibacumab	12/14	To treat inhalational anthrax, a form of the infectious disease caused by breathing in the spores of the bacterium Bacillus anthracis.
Signifor	pasireotide	12/14	To treat Cushing's disease patients who cannot be helped through surgery
Gattex	teduglutide	12/21	To treat adults with short bowel syndrome (SBS) who need additional nutrition from intravenous feeding (parenteral nutrition).
Juxtapid	lomitapide	12/21	To reduce low-density lipoprotein (LDL) cholesterol, total cholesterol, apolipoprotein B, and non-high-density lipoprotein (non-HDL) cholesterol in patients with homozygous familial hypercholesterolemia (HoFH).
Sirturo	bedaquiline	12/28	As part of combination therapy to treat adults with multi-drug resistant pulmonary tuberculosis (TB) when other alternatives are not available.
Eliquis	apixaban	12/28	To reduce the risk of stroke and dangerous blood clots (systemic embolism) in patients with atrial fibrillation that is not caused by a heart valve problem.
Fulyzaq	crofelemer	12/31	To treat HIV/AIDS patients whose diarrhea is not caused by an infection from a virus, bacteria, or parasite.