TRENDS-in-MEDICINE

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# Quick Takes

**…Highlights from this week's news relating to drugs and devices in development that are not covered in other *Trends-in-Medicine* reports…**

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## SHORT TAKES

- **AETERNA ZENTARIS' AEZS-130** – The company said it completed its Phase III study of this first oral diagnostic test for adult growth hormone deficiency (AGHD) and plans to file a new drug application (NDA) with the FDA in a few months.
- **Affitoxin** – A National Cancer Institute study published in ***Clinical Cancer Research*** found this newly developed protein may target human epidermal growth factor receptor 2 (HER2)-positive tumors that have stopped responding to **Roche/Genentech**'s anti-HER2 agent, **Herceptin** (trastuzumab).
- **Alpha-B-crystallin** – Administering this naturally occurring substance as many as 12 hours after a stroke reduced the size of the brain lesion, according to a mouse study published in the ***Proceedings of the National Academy of Sciences***. The study showed the protein reduced swelling after stroke and worked like a sponge to soak up inflammatory molecules in the brain.
- **ALPHATEC SPINE's PureGen** – The FDA sent the company a warning letter about this stem cell-based bone regeneration product, saying **Parcell** (Alphatec's partner) needs a biologics license to further develop it and that the product had been miscategorized.
- **BAYER's Xarelto (rivaroxaban)** – This blood thinner did ***not*** increase the risk of bleeding in non-valvular atrial fibrillation patients at risk of stroke when compared to warfarin, according to a Phase III Japanese study. Xarelto was non-inferior to warfarin in the composite of major and non-major clinically-relevant bleeding.
- **BERLIN HEART's Excor** – The FDA's Circulatory System Devices advisory panel recommended in favor of a humanitarian device exemption (HDE) for this ventricular assist device for use in children as a bridge to heart transplant.
- **BIONOR's Vacc-4x** – In a 135-patient Phase II trial, this peptide-based therapeutic vaccine, which aims to improve and sustain immune responses to the HIV-1 core protein p24, appeared to reduce the viral load in HIV patients who have maintained a viral response after discontinuing antiretroviral therapy (ART) in the previous six months, according to research presented at the International AIDS Society HIV conference in Rome.
- **BRISTOL-MYERS SQUIBB** plans to buy **Amira Pharmaceuticals**, including Amira's key experimental drug, AM-152, for pulmonary fibrosis. Amira also has a research program focused on autotaxin, an enzyme that could develop into treatments for nerve pain and cancer metastases.

- **CETERO RESEARCH** – The FDA told pharmaceutical companies this contract research organization (CRO) in Texas faked documents between April 2005 and June 2010, and studies may need to be repeated or confirmed. FDA inspections as well as the company's own investigation and third-party audit found "significant instances of misconduct and violations of federal regulations, including falsification of documents and manipulations of samples."

- **Computer-aided detection (CAD) technology** – A study in the ***Journal of the National Cancer Institute*** found CAD is ineffective in finding breast tumors and increases a woman's risk of being called back for more unnecessary testing. The analysis of 1.6 million mammograms found "breast cancers were detected at a similar stage and size regardless of whether or not radiologists used CADs."

- **DAVITA's dialysis clinics** – A former clinic nurse and a physician are suing the company, alleging it deliberately wasted medicine "in order to reap hundreds of millions of dollars" because Medicare pays for portions "deemed unavoidable waste." The U.S. government investigated the claims for more than two years and did not join the lawsuit, but the nurse and doctor recently filed an amended complaint.

- **ISTA PHARMACEUTICALS' Bromday (bromfenac ophthalmic solution)** – The FDA sent a warning letter to the company saying its promotional materials for this eye solution for cataract surgery patients were false and misleading and made it appear that the drops are safer than has been demonstrated, omitted possible adverse effects, and neglected to caution against using the product while wearing contact lenses.

- **JOHNSON & JOHNSON's Simponi (golimumab)** – The FDA rejected a new indication for this immune disorder drug, denying approval for limiting progression of structural damage in patients with moderate to severe rheumatoid arthritis.

- **LILLY and AMYLIN's Bydureon (exenatideXR)** – This once-weekly Type 2 diabetes drug was resubmitted to the FDA. The FDA rejected the drug in October 2010, asking for a QT study. The companies did the study and believe it satisfactorily answers the FDA's concerns. The companies also provided the Agency with the results of the DURATION-5 trial comparing Bydureon to BID Byetta (exenatide) and updated safety data from completed and ongoing trials. The FDA review is likely to take six months.

- **MERCK's vernakalant** – The company is buying from **Astellas** the exclusive North American rights to develop and market the intravenous formulation of this drug for patients with atrial fibrillation.

- **MYRIAD GENETICS** – In a 2-1 decision, the U.S. Court of Appeals for the Federal Circuit ruled that Myriad's BRCA1 and BRCA2 gene tests for breast and ovarian cancer risk are valid. The court said a company can patent genes when they are "markedly different" and have been cleaved so they have a "distinctive chemical identity and nature" that is different from molecules that exist in nature.

- **NOVARTIS/HEXAL's ibandronic acid** – Hexal, a generic unit of Novartis, withdrew its European marketing authorization application for a generic version of **Roche's Bondronat** for preventing skeletal events in breast cancer patients.

- **Ovarian and pancreatic cancer** – Massachusetts Institute of Technology (MIT) researchers identified a new way to shut off one of the proteins that spreads cancer growth – the HER3 protein receptor – according to a study in the ***Journal of Biological Chemistry***.

- **Pacemakers** – The FDA issued draft guidance that would classify implantable pacemaker pulse generators (including internal batteries) as Class III devices, which require premarket approval. The Agency said that the change would result in better safety and efficacy and help solve problems including failure to pace, improper pacing rate, arrhythmias, and tissue damage.

- **RAPTOR's RP-103 (cysteamine)** – This investigational drug for nephropathic cystinosis was found to be non-inferior to **Mylan's Cystagon** (cysteamine bitartrate) in a 38-patient Phase III trial.

- **SHIRE PHARMACEUTICALS' Tenex (guanfacine)** – A study in the journal ***Nature*** found this high blood pressure medication improved brain function in six older macaque monkeys. Researchers said the study may help determine what goes wrong in the prefrontal cortex during aging.

- **TU-025 (keishibukuryogan)** – This traditional Japanese herbal remedy made up of cinnamon bark, peach pits, and other organic ingredients does not reduce menopause-related hot flashes, according to a study in the journal ***Menopause***.

- **VALEANT PHARMACEUTICALS** – ***The Wall Street Journal*** reported the company wants to take over **Meda AB**, a Swedish specialty pharma that makes respiratory, cardiology, dermatology, and pain and inflammation drugs.

- **YAUPON THERAPEUTICS' gel-based topical mechlorethamine hydrochloride** was submitted to the FDA for approval to treat early-stage mycosis fungoides, a form of

cutaneous T-cell lymphoma. Mechlorethamine is approved as IV chemotherapy for the disorder, but this is a topical form.

## NEWS IN BRIEF

### ASTRAZENECA

- **Brilinta (ticagrelor).** The company reportedly plans to launch this antiplatelet drug at a premium price as soon as August 2011.
- **DOJ investigation.** The Department of Justice subpoenaed **Medco** for data on AstraZeneca's arrangements with Medco relating to four drugs: Nexium (esomeprazole), Prilosec (omeprazole), Plendil (felodipine), and Toprol XL (metoprolol succinate).

### AVI BIOPHARMA's VI-4658 – promising results in muscular dystrophy

This molecular patch for gene repair may safely stop muscle degeneration in patients with Duchenne muscular dystrophy, according to a study in ***The Lancet***. The researchers wrote that exon skipping resulted in biochemical responses in seven out of 19 patients. The three patients with the best response went from 5% of their muscle fibers staining positive for dystrophin to 15%, 21%, and 55% staining positive after treatment.

### BOEHRINGER INGELHEIM's Pradaxa (dabigatran) – less VTE but more bleeding

Treatment with this direct thrombin inhibitor following six to 18 months of conventional anticoagulation therapy in venous thromboembolism (VTE) patients reduced the risk of recurrent VTE but increased bleeding events compared to patients on placebo, according to a 1,343-patient study presented at the International Society on Thrombosis and Haemostasis (ISTH) meeting in Japan and published in the ***Journal of Thrombosis and Haemostasis***. The expected rate of recurrent VTE is 10% during the first year, and ~30% of VTE patients will likely have a new event within 10 years.

**Pradaxa or Placebo for 6 Months Following 6-18 Months of Warfarin**

| Measurement | Pradaxa | Placebo | p-value |
|---|---|---|---|
| Recurrent VTE | 0.4% | 5.6% | <0.0001 |
| Clinically relevant bleeding events | 5.3% | 1.8% | 0.001 |
| Major gastrointestinal bleeds requiring tranfusions | 0.39% | 0 | --- |

### DYNAVAX TECHNOLOGIES' Heplisav – moving forward

The company said the FDA's Center for Biologics Evaluation and Research (CBER) is satisfied this experimental hepatitis B vaccine demonstrated consistency in a recently completed trial. The company previously said the vaccine did not meet one of the "consistency" goals because one production lot had higher concentrations of antibodies than the others at 8 weeks. However, the FDA apparently decided the vaccine met consistency criteria at enough other time points. The company now hopes to file the vaccine by the end of 2011.

### EDWARDS LIFESCIENCES' Sapien XT – better than first generation device

XT is the newest generation of this transcatheter aortic heart valve, and the short-term performance is similar to the first generation device (THV), but it may do a better job of lowering the risk of major vascular complications according to a 120-patient study in the ***Journal of the American College of Cardiology: Cardiovascular Interventions***.

The Sapien XT is approved in Europe but not in the U.S.; an FDA panel recently recommended approval of the older Sapien THV.

In the 120-patient XT study, early death rates were low, with an overall 30-day mortality of 1.7%. Two patients died after XT implantation: one hours after the procedure due to right ventricular failure, and the other in the cath lab because of annular and aortic dissection resulting in cardiac tamponade. There was one transient ischemic attack and one major stroke in each group.

In further analyses, the researchers found the ratio of the sheath outer diameter size to the vessel minimal lumen diameter was a significant predictor of major vascular events (p=0.004).

**30-Day Results of Sapien XT vs. Sapien THV**

| Measurement | Sapien XT | Sapien THV | p-value |
|---|---|---|---|
| Major vascular events | 11.1% | 33.3% | 0.004 |
| Minimal lumen diameter of the iliofemoral artery | 7.27 mm | 7.94 mm | 0.002 |
| Device success | 96.3% | 92.4% | 0.004 |
| Cardiac tamponade | 7.4% | 1.5% | --- |
| Life-threatening events | 18.5% | 27.3% | --- |
| Major bleeding events | 35.2% | 40.9% | --- |
| Blood transfusions | 33.3% | 57.6% | --- |
| 30-day combined safety | 20.4% | 45.5% | 0.04 |
| Mean transaortic gradient at 30 days | 10 mmHg | 10 mmHg | ---- |
| Mild-to-moderate aortic regurgitation | 70.2% | 76.2% | --- |

A ***CRTonline.org*** survey found that the major concerns of cardiologists with respect to transcatheter aortic valve replacement (TAVR) are: 43% higher stroke rate, 25% access to the technology, 13% cost, 13% durability, and 8% higher vascular complication rate.

### Glucocorticosteroid drugs – side effect warning urged

Public Citizen said the FDA should require all manufacturers of synthetic steroids – such as prednisone, methylprednisolone, and dexamethasone – to revise their labels to warn about a rare but serious adverse side effect that could leave patients with conditions such as central serous chorioretinopathy, a rare disease in which fluid accumulates under the retina, causing it to detach from the inner lining of the eye. Public Citizen's review of the labels of steroid drugs found only 13% included a warning about this eye condition.

### JOHNSON & JOHNSON – reducing maximum acetaminophen OTC doses

The company (through its McNeil Consumer Healthcare Division) is reducing the maximum daily dose of its Extra Strength Tylenol pain reliever to lower risk of accidental acetaminophen overdose from 4,000 mg (8 pills daily) to 3,000 mg (6 pills daily). The FDA ordered a reduction in acetaminophen in prescription painkillers but hasn't ordered OTC reductions yet, so this appears to be a pre-emptive move.

### MERCK

- **Downsizing.** Plans to cut its workforce by 12%-13% by the end of 2015 as part of its Merger Restructuring Program.
- **Contamination.** Found tiny fragments of charred shrink-wrap in vaccine vials at its Pennsylvania plant, where most of its vaccines are manufactured. Affected vaccines include **Gardasil** for HPV; **MMR II** for measles, mumps, and rubella; **Pneumovax** for pneumococcal disease; **Varivax** for chickenpox; and **Zostavax** for shingles.

### PFIZER's Zyvox (linezolid) – combining with antidepressants can be fatal

The FDA said it received reports of serious central nervous system (CNS) reactions when this antibacterial drug was taken along with serotonin-specific reuptake inhibitors (SSRIs) and other serotonergic antidepressants. **Lilly's Cymbalta (duloxetine)** and **GlaxoSmithKline's Paxil (paroxetine)** are among the 29 psychiatric drugs patients should stop temporarily while taking Zyvox, which is given for infections such as vancomycin-resistant *Enterococcus faecium* (VRE) as well methicillin-resistant *Staphylococcus aureus* (MRSA) and nosocomial pneumonia.

### PFIZER and BRISTOL-MYERS SQUIBB's Eliquis (apixaban) – fails in ACS patients

This direct Factor Xa inhibitor was associated with an increase in the number of bleeding events in patients with acute coronary syndrome (ACS) but without a significant reduction in recurring ischemic events, according to a study published in the ***New England Journal of Medicine***. High-risk ACS patients were given antiplatelet therapy ± Eliquis 5 mg BID. Patients taking Eliquis had more intracranial and fatal bleeding events vs. placebo. The APPRAISE-2 trial was stopped in November 2010, and the final results were presented at ISTH.

**APPRAISE-2 Final Results**

| Measurement | Eliquis | Placebo | p-value |
|---|---|---|---|
| Major bleeding | 1.3% | 0.5% | 0.001 |
| Cardiovascular death, MI, or ischemic stroke | 7.5% | 7.9% | Nss, 0.51 |

### ROCHE/GENENTECH's Avastin (bevacizumab) – NCCN guidelines still support use in breast cancer

Although an FDA panel voted unanimously in June that the FDA should proceed with withdrawing approval for Avastin in metastatic breast cancer, the National Comprehensive Cancer Network's (NCCN) breast cancer guideline committee voted 24 to 0 (with one abstention) to stand by its recommendation that combining Avastin with **Bristol-Myers Squibb's Taxol (paclitaxel)** "is an appropriate therapeutic option for metastatic breast cancer." According to ***MedPage Today***, 10 of the panel's 33 members, including the chairman, have relationships with Roche/Genentech.

### SANOFI/GENZYME

- **Kynamro (mipomersen).** This weekly injectable cholesterol-lowering medication, being developed with **Isis Pharmaceuticals**, was submitted to European regulators for approval to treat familial hypercholesterolemia. The companies plan to submit the drug to the FDA later this year.
- **Fabrazyme (agalsidase beta).** This treatment for Fabry disease will remain in short supply until at least early 2012 because the company said it cannot increase production until a new plant is ready.

### SANTHERA PHARMACEUTICALS' Catena (idebenone) – positive early results

A small study published in the journal ***Brain*** found this antioxidant slowed vision loss in patients with Leber's hereditary optic neuropathy (LHON) vs. placebo. The U.K. researchers reported that after 24 weeks, 38% of idebenone patients vs. 24% of placebo patients had improved visual actuity.

### TAKEDA

- **Alogliptin.** The company resubmitted this Type 2 diabetes drug to the FDA both as a single agent and in a fixed-dose combination with **Actos (pioglitazone)**.
- **Takeda and Affymax's peginesatide (formerly Hematide).** The FDA said it will review this once-monthly drug for anemia in kidney patients on dialysis.

### VERTEX's VX-222 – may boost Incivek + traditional therapy in HCV

This oral hepatitis C virus (HCV) polymerase inhibitor worked in combination with traditional therapy and Vertex's newly-approved **Incivek (telaprevir)**, boosting 24-week complete virologic response rates to 90% in a Phase II study. Of 30 HCV-1 patients who received a high dose of VX-222 along with pegylated interferon/ribavirin (pIFR) and Incivek, 27 had undetectable viral load at 24 weeks. Complete virologic responses were seen in all 13 patients not eligible to stop treatment at 12 weeks and who took the combination for 24 weeks. However, the drug was not effective without pIFR.

## REGULATORY NEWS

### FDA's bioequivalency standards

The FDA's Pharmaceutical Science and Clinical Pharmacology Advisory Committee met to discuss the Agency's proposed new and stricter standards for deciding when generic drugs with a narrow therapeutic index (NTI) can be considered bioequivalent to brand name versions. Currently, a generic drug can be within 80%-125% of the brand, but that may not be a tight enough range for NTI drugs. In particular, the FDA is worried about seven generic drugs: **warfarin**, **levothyroxine** (a thyroid medication), **carbamazepine** (an antiepileptic), **lithium carbonate** (an antimanic), **digoxin** (a cardiac drug), **phenytoin** (an anticonvulsant), and **theophylline** (a respiratory drug).

### FDA Commissioner defends the Agency

FDA Commissioner Margaret Hamburg, MD, told a small crowd at a Public Citizen-sponsored discussion that the Agency is often the first regulatory body to award approval, despite the notion that Europe approves drugs and devices much more quickly. She added speed is not the most important factor, "The No. 1 issue for the American people is that they can have trust and confidence that the products we reviewed are in accordance with science and efficacy and that our Agency has a commitment to that regulatory process that is unwavering."

*Asked about the high turnover rate at the Center for Devices and Radiological Health (CDRH)*, Dr. Hamburg suggested user fees from pharmaceutical companies have improved things.

### FDA issues new PMA submission rules

The FDA issued draft guidance on when changes or modifications to a previously cleared 510(k) device would require a new premarket submission (PMA), including changes to the technology or materials used in the device, manufacturing changes that could significantly affect safety or effectiveness, or a major change in or modification to the device's intended use.

### FDA reauthorization threatened

Sen. Richard Burr (R-NC) warned he will delay the passage of a major FDA reauthorization (user fees) unless the Agency speeds up its approval of medical devices. Sen. Burr wants the FDA to agree to "stop the clock" on its performance goals while it waits for more information from manufacturers. However, Senate Health Committee Chair Sen. Tom Harkin (D-IA) defended the FDA against Sen. Burr's threat.

### HHS plans human study rule change

Because the current research climate includes genomics studies using patient DNA, the Department of Health and Human Services (HHS) said proposed changes in rules in research involving humans include requiring researchers to get a study participant's consent to having biospecimens, such as blood, used in studies other than the one in which the patient originally enrolled. Another major change would require that all institutions receiving federal money follow the federal guidelines for human research.

Public Citizen's Health Research Group complained the comment period on the proposed changes is "grossly inadequate" and sent a letter to HHS Secretary Kathleen Sebelius asking her to extend the deadline from 60 days to 120 days.

### IOM recommends the FDA totally revamp the 510(k) device approval program

The Institute of Medicine (IOM) issued a report commissioned by the FDA in 2009 on the 510(k) device approval program, but the FDA may not like the findings. The report – "Medical Devices and the Public's Health: The FDA 510(k) Clearance Process at 35 Years" – concluded that thousands of medical devices are cleared every year for sale without being assessed for safety and effectiveness and that the clearance process [the 510(k) program] should be abandoned.

The IOM said the 510(k) program is "fundamentally flawed" because medical device clearance is based on substantial equivalence to devices already on the market, without looking at safety and efficacy data. The IOM recommended the FDA design a totally new regulatory framework for Class II [moderate-risk] devices. And the IOM said the FDA should "move away from the 510(k) clearance process…as soon as reasonably possible."

In January the FDA announced some changes of its own to the 510(k) program and said more changes are planned, but those steps fall far short of what the IOM recommends – a new system that focuses on safety and efficacy evaluations before and after products come to market.

The FDA responded to the report by opening a docket to receive public comments and by announcing plans to hold a public meeting to discuss the IOM recommendations in "the weeks to come."

### EU to review pharma/patient communications

The European Commission told the European Medicines Agency (EMA) it will review its policy on how pharmaceutical companies may communicate with patients, saying "It is uncertain whether restrictions will be lifted." Currently, pharmas cannot do direct-to-consumer advertising in Europe as in the U.S. The new rules are expected by September or October 2011.

### FDA approvals/clearances

- **ARTHROCARE's SpeedFix** – This suture system is for repairing tears in the shoulder joint using double-loaded proprietary MagnumWire sutures.
- **PHARMALUCENCE's Sulfur Colloid Injection (SCI)** – The FDA approved an additional indication for this test in which an injected radioactive tracer labels lymph nodes with a radioactive signal, thereby helping doctors discern whether cancer has spread to the lymph nodes.
- **REFLEXONIC's Viberect** – This device for mild-to-moderate erectile dysfunction delivers targeted nerve stimulation to both dorsal and ventral surfaces of the penis.

### FDA warnings

**ELECTRO-CAP INTERNATIONAL** – for problems with its documentation processes and design changes related to its products.

### European, Canadian, and Australian approvals

- **BIOGEN IDEC's Fampyra (fampridine)** – Conditional European approval was granted for this multiple sclerosis drug for the indication of improved walking, but the company must complete a long-term follow-up study of the drug's benefits. The drug is marketed in the U.S. as **Ampyra**.
- **GI DYNAMICS' EndoBarrier Gastrointestinal Liner** – The Australian Therapeutic Goods Administration gave approval to market this implant, which forms a barrier between food and the intestine for the treatment of obesity and Type 2 diabetes.
- **HANSEN MEDICAL's Magellan** – The European Union cleared this robotic system designed to help doctors navigate to anatomical targets in the peripheral vasculature.
- **VALEANT's Sublinox (zolpidem)** – This tablet for short-term treatment and symptomatic relief of insomnia was approved in Canada.

### U.K.'s National Institute for Health and Clinical Excellence (NICE)

- **ALLERGAN's Ozurdex (dexamethasone implant)** was approved for the treatment of macular edema.
- **CELGENE's Thalomid (thalidomide)** was approved to treat multiple myeloma in patients who can't receive high-dose chemotherapy with stem-cell transplants.

| Upcoming FDA Advisory Committees and Other Regulatory Meetings of Interest (*items in RED are new since last week*) | | |
|---|---|---|
| **Date** | **Topic** | **Committee/Event** |
| | **August 2011** | |
| August 12 | **Physician-owned distributorships (PODs)** | Inspector General initial report due to Senate Finance Committee |
| August 19 | FDA's draft **Strategic Plan for Regulatory Science**, including an update on the Nanotechnology Program | FDA's independent Science Board |
| August 20 | **Regeneron's aflibercept** (VEGF Trap-Eye) for wet AMD | PDUFA date |
| August 25 | **Shire's Firazyr** (icatibant injection) for hereditary angioedema | PDUFA date |
| August 30 | **Seattle Genetics and Takeda's Adcetris** (brentuximab vedotin) for two orphan indications – refractory Hodgkin's lymphoma and anaplastic large cell lymphoma (ALCL) | PDUFA date |
| | **September 2011** | |
| September 7 | Design of clinical trials for systemic antibacterial agents for the **treatment of acute otitis media** | FDA public workshop |
| September 8 | **Johnson & Johnson's Xarelto** (rivaroxaban) for the prevention of stroke and systemic embolism in patients with non-valvular atrial fibrillation | FDA's Cardiovascular and Renal Drugs Advisory Committee |
| September 8-9 | Safety of **transvaginal mesh** for pelvic organ prolapse | FDA's Obstetrics and Gynecology Devices Advisory Committee |
| September 9 | Safety of **bisphosphonates** in osteoporosis | Joint meeting of the FDA's Reproductive Health Drugs Advisory Committee and Drug Safety and Risk Management Advisory Committee |
| September 13 | **Anti-nerve growth factor (NGF)** drug class safety review | FDA's Arthritis Advisory Committee |
| **September 14** | **Apotex's Ferriprox** (deferiprone) for transfusional iron overload | FDA's Oncologic Drugs Advisory Committee |
| | **Other 2011 meetings/events** | |
| 2H11 | **Abbott's RX Acculink** carotid stent | FDA final decision expected |
| 4Q11 | **Ophthotech's ARC-1905** primary endpoint results in Phase I trial in dry AMD | Company announcement or medical conference presentation |
| 4Q11 | **Roche/Genentech's Lucentis** (ranibizumab) – Phase III HARBOR trial one-year data on the 2 mg dose in wet AMD | Company announcement or medical conference presentation |
| **October 28** | **Bristol-Myers Squibb and AstraZeneca's dapagliflozin,** the first SGLT-2 for Type 2 diabetes | PDUFA date |
| October 28 | **Pacira Pharmaceuticals' Exparel** (bupivacaine extended-release liposome injection), a painkiller | PDUFA date |
| December | **Allergan's brimonidine tartrate intravitreal implant** – Phase II trial in dry AMD to complete | Company announcement or medical conference presentation |
| December 8 | **Antares Pharma's Anturol** (transdermal oxybutynin ATD gel), a treatment for overactive bladder | PDUFA date |
| December 13 | **Endo Pharmaceuticals' Opana** (extended-release oxymorphone), a painkiller | PDUFA date |
| | **2012 meetings/events** | |
| February | **Alcon's tandospirone** for dry AMD – Phase III final data expected | Company announcement or medical conference presentation |
| February 17 | **Corcept Therapeutics' Corlux** (mifepristone) for Cushing's syndrome | PDUFA date |
| February 28 | **Pfizer's axitinib** for advanced renal cell carcinoma | PDUFA date (*approximate*) |
| April 30 | **Vivus' avanafil** for erectile dysfunction | PDUFA date (*approximate*) |
| April 30 | **Baxter and Halozyme's HyQ** for immunodeficiency | PDUFA date |