New Drug Update 2015

Inpatient/Specialty Focus

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Objectives

- Identify significant drugs that were approved by the FDA within the past year
- Describe indications, doses, formulations, adverse effects, drug interactions, and pertinent patient counseling points for recently approved drugs
- Discuss the clinical impact and potential role in therapy of recently approved drugs
# New Molecular Entities

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<td>Dalbavancin</td>
<td>ABSSSI</td>
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<td>Orbactiv</td>
<td>Oritavancin</td>
<td>ABSSSI</td>
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<td>Sivextro</td>
<td>Tedizolid</td>
<td>ABSSSI</td>
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<td>Ceftolozane/Tazobactam</td>
<td>cUTI and cIAI</td>
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<td>Harvoni</td>
<td>Ledipasvir/Sofosbuvir</td>
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<td>Hepatitis C</td>
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<td>Rapivab</td>
<td>Peramivir</td>
<td>Influenza</td>
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</table>
Significant **advantage** over existing therapies

No significant advantage or disadvantage

Significant **disadvantage**
Dalbavancin (Dalvance™)
Oritavancin (Orbactiv™)
Tedizolid (Sivextro®)

New Gram-Positive Antibacterial Agents
Dalbavancin (Dalvance™)

- **Drug Class**
  - Lipoglycopeptide antibiotic

- **Mechanism of Action**
  - Bacterial cell wall synthesis inhibitor

- **FDA Indication**
  - Acute bacterial skin and skin structure infections caused by susceptible strains of Gram-positive organisms

http://www.dalvance.com/
Dalbavancin

- **How Supplied**
  - Single-use vial
  - 500 mg powder for reconstitution

- **Dosage**
  - 1000 mg IV on Day 1 then 500 mg IV on Day 8
  - Decrease to 750 mg Day 1 and 375 mg Day 8 in CrCl < 30 mL/min
Dalbavancin

- **Precautions**
  - Hypersensitivity to glycopeptides
  - Infusion-related reactions

- **Contraindications**
  - Known hypersensitivity to dalbavancin

- **Drug Interactions**
  - None?
Dalbavancin

- Pregnancy Category C

- Adverse Effects
  - Nausea, headache, diarrhea
  - ALT elevations

- Patient Education
  - Importance of returning for second dose

## Dalbavancin Study Data

<table>
<thead>
<tr>
<th>Trial</th>
<th>Dalbavancin</th>
<th>Comparator</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISCOVER 1</td>
<td>83.3% (240/288)</td>
<td>81.8% (233/285)</td>
</tr>
<tr>
<td>DISCOVER 2</td>
<td>76.8% (285/371)</td>
<td>78.3% (288/368)</td>
</tr>
</tbody>
</table>
Dalbavancin

The Bottom Line…
- Once weekly dosing
- Similar spectrum to vancomycin
- ~$4500 for full course
Oritavancin (Orbactiv™)

- **Drug Class**
  - Lipoglycopeptide antibiotic

- **Mechanism of Action**
  - Bacterial cell wall synthesis inhibitor

- **FDA Indication**
  - Acute bacterial skin and skin structure infections caused by susceptible strains of Gram-positive organisms

[ORBACTIV™ (Oritavancin) for injection]

http://www.orbactiv.com/
Oritavancin

- **How Supplied**
  - Single-use vial
  - 400 mg powder for reconstitution

- **Dosage**
  - 1200 mg IV over 3 hours
  - No dose adjustment necessary in renal or hepatic impairment

Oritavancin

- Precautions
  - Hypersensitivity to glycopeptides
  - Infusion-related reactions

- Contraindications
  - Use of IV unfractionated heparin for 48 hours

- Drug Interactions
  - Narrow therapeutic range drugs (2C19, 2C9, 3A4, 2D6)
Oritavancin

- Pregnancy Category C

- Adverse Effects
  - Headache
  - Nausea
  - Vomiting
  - Diarrhea
Oritavancin Study Data

<table>
<thead>
<tr>
<th>Trial</th>
<th>Oritavancin</th>
<th>Comparator</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOLO I</td>
<td>82.3% (391/475)</td>
<td>78.9% (378/479)</td>
</tr>
<tr>
<td>SOLO II</td>
<td>80.1% (403/503)</td>
<td>82.9% (416/502)</td>
</tr>
</tbody>
</table>

Oritavancin

- The Bottom Line...
  - One-time dose
  - Similar spectrum to vancomycin
  - ~$4500 for one dose
Tedizolid (Sivextro®)

- **Drug Class**: Oxazolidinone antibiotic

- **Mechanism of Action**: Inhibits bacterial protein synthesis by binding to the 50S ribosomal subunit

- **FDA Indication**: Acute bacterial skin and skin structure infections caused by susceptible strains of Gram-positive organisms

http://www.sivextro.com/
Tedizolid

- **How Supplied**
  - 200 mg tablets
  - 200 mg powder for reconstitution

- **Dosage**
  - 200 mg PO or IV once daily
  - No dose adjustment necessary for renal or hepatic impairment

Tedizolid

- **Precautions**
  - Not evaluated in patients with neutropenia

- **Drug Interactions**
  - Reversible monoamine oxidase inhibitor *in vitro*
  - Serotonergic agents?

- **Pregnancy Category C**
Tedizolid

- **Adverse Effects**
  - Nausea, vomiting, diarrhea
  - Headache
  - Dizziness

- **Patient Education**
  - May be taken with or without food
## Tedizolid Study Data

<table>
<thead>
<tr>
<th>Trial</th>
<th>Tedizolid</th>
<th>Comparator</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESTABLISH 1</td>
<td>79.3% (256/323)</td>
<td>79.1% (258/326)</td>
</tr>
<tr>
<td>ESTABLISH 2</td>
<td>85.2% (283/332)</td>
<td>82.6% (276/334)</td>
</tr>
</tbody>
</table>
Tedizolid

- The Bottom Line...
  - Similar spectrum to linezolid
  - Available IV and PO
  - Fewer drug interactions?
  - $1700-$2200 for 6 day course

Ceftolozane/tazobactam (Zerbaxa™)  
*New Combination Antibacterial Agent*
Ceftolozane/tazobactam (Zerbaxa™)

- **Drug Class**
  - Cephalosporin + beta-lactamase inhibitor

- **Mechanism of Action**
  - Bacterial cell wall synthesis inhibitor

- **FDA Indications**
  - Complicated intra-abdominal infections (in combination with metronidazole)
  - Complicated urinary tract infections, including pyelonephritis

http://www.zerbaxa.com/
Ceftolozane/tazobactam

- **How Supplied**
  - Single-use vial
  - 1 g/0.5 g powder for reconstitution

- **Dosage**
  - 1.5 g IV every 8 hours
  - Dose adjustment required in renal impairment
Ceftolozane/tazobactam

- **Precautions**
  - Decreased efficacy in CrCl 30-50 mL/min

- **Contraindications**
  - Hypersensitivity

- **Drug Interactions**
  - None observed or anticipated
Ceftolozane/tazobactam

- Pregnancy Category B

- Adverse Effects
  - Nausea
  - Diarrhea
  - Headache
  - Pyrexia
## Ceftolozane/tazobactam Study Data

<table>
<thead>
<tr>
<th>Indication</th>
<th>Ceftolozane/tazobactam</th>
<th>Comparator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-abdominal Infections</td>
<td>83% (323/389)</td>
<td>87.3% (364/417)</td>
</tr>
<tr>
<td>Urinary Tract Infections</td>
<td>76.9% (306/398)</td>
<td>68.4% (275/402)</td>
</tr>
</tbody>
</table>
Ceftolozane/tazobactam

The Bottom Line…

- Broad gram negative coverage, including *Pseudomonas* and *Enterobacter*
- Limited anaerobic coverage as monotherapy
- No antistaphylococcal activity
- $250 per day
BREAKING NEWS!!!

- Ceftazidime/avibactam (Avycaz™)
  - Approved this week
  - Indicated for complicated intra-abdominal infections and urinary tract infections
Ledipasvir/Sofosbuvir (Harvoni™)
Ombitasvir/Paritaprevir/Ritonavir + Dasabuvir (Viekira Pak™)

New Antiviral Agents for Chronic Hepatitis C
## Previous Treatment Options for Hepatitis C

<table>
<thead>
<tr>
<th>First Line Options</th>
<th>Second Line Options</th>
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</thead>
<tbody>
<tr>
<td>Peginterferon alfa</td>
<td>Ribavirin</td>
</tr>
<tr>
<td>Telaprevir (Incivek®)</td>
<td>Boceprevir (Victrelis®)</td>
</tr>
<tr>
<td>Simeprevir (Olysio™)</td>
<td>Sofosbuvir (Sovaldi™)</td>
</tr>
</tbody>
</table>
Ledipasvir/Sofosbuvir (Harvoni™)

- **Drug Class**
  - *Fixed-dose combination of viral replication inhibitors*

- **Mechanism of Action**
  - Ledipasvir inhibits HCV NS5A protein
  - Sofosbuvir inhibits NS5B RNA-dependent polymerase

- **FDA Indication**
  - Treatment of chronic hepatitis C genotype 1 infection
Ledipasvir/Sofosbuvir

- **How Supplied**
  - 90 mg/400 mg tablets

- **Dosage**
  - 1 tablet PO once daily with or without food for 12 to 24 weeks
  - No dose recommendation in severe renal impairment or ESRD

http://www.marketwatch.com

HARVONI™ [prescribing information]. Foster City, CA: Gilead Sciences, Inc; 2014.
Ledipasvir/Sofosbuvir

- Precautions & Contraindications
  - None

- Drug Interactions
  - Potent intestinal P-gp inducers (rifampin, St. John’s wort)
  - Acid reducing agents

- Pregnancy Category B
Ledipasvir/Sofosbuvir

- **Adverse Effects**
  - Fatigue
  - Headache
  - Nausea
  - Diarrhea
  - Insomnia

- **Patient Education**
  - Take with or without food
  - Store in original container

HARVONI™ [prescribing information]. Foster City, CA: Gilead Sciences, Inc; 2014.
## Ledipasvir/Sofosbuvir Study Data

<table>
<thead>
<tr>
<th>Trial</th>
<th>SVR 12 Weeks</th>
<th>SVR 24 Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ION-1</td>
<td>99% (210/213)</td>
<td>--</td>
</tr>
<tr>
<td>ION-2 (without cirrhosis)</td>
<td>95% (83/87)</td>
<td>99% (85/86)</td>
</tr>
<tr>
<td>ION-2 (with cirrhosis)</td>
<td>86% (19/22)</td>
<td>100% (22/22)</td>
</tr>
</tbody>
</table>
Ledipasvir/Sofosbuvir

- **The Bottom Line...**
  - Once daily dosing
  - PO-only regimen
  - $94,500 for 12 week course
Ombitasvir/Paritaprevir/Ritonavir + Dasabuvir (Viekira Pak™)

- **Drug Class**
  - *Fixed-dose combination of viral replication inhibitors*

- **Mechanism of Action**
  - Ombitasvir inhibits HCV NS5A protein
  - Paritaprevir inhibits HCV NS3/4A protease
  - Ritonavir inhibits CYP3A
  - Dasabuvir inhibits NS5B RNA-dependent polymerase

- **FDA Indication**
  - Treatment of chronic hepatitis C genotype 1 infection with or without ribavirin

http://www.viekira.com/
Ombitasvir/Paritaprevir/Ritonavir + Dasabuvir

How Supplied
- Tablets
- Daily dose packs in weekly and monthly cartons

Dosage
- Two ombitasvir 12.5 mg/paritaprevir 75 mg/ritonavir 50 mg tablets PO once daily with food
- One dasabuvir 250 mg tablet PO twice daily with food
Ombitasvir/Paritaprevir/Ritonavir + Dasabuvir

- **Contraindications**:  
  - Severe decompensated liver disease  
  - Contraindications to ribavirin (if used in combination)

- **Drug Interactions**:  
  - Strong CYP3A inducers and CYP2C8 inducers/inhibitors  
  - CYP3A4 substrates  
  - Ethinyl estradiol

- **Pregnancy Category B (X if used with ribavirin)**

VIEKIRA PAK™ [prescribing information]. North Chicago, IL: AbbVie, Inc; 2014.
Ombitasvir/Paritaprevir/Ritonavir + Dasabuvir

- **Adverse Effects**
  - Fatigue
  - Nausea
  - Pruritus
  - Insomnia
  - Asthenia

- **Patient Education**
  - Take with food
  - Avoid pregnancy when used with ribavirin

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VIEKIRA PAK™ [prescribing information]. North Chicago, IL: AbbVie, Inc; 2014.
# Ombitasvir/Paritaprevir/Ritonavir + Dasabuvir Study Data

<table>
<thead>
<tr>
<th>Trial</th>
<th>SVR 12 Weeks</th>
<th>SVR 24 Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAPPHIRE-I</td>
<td>96% (308/322)</td>
<td>--</td>
</tr>
<tr>
<td>SAPPHIRE-II</td>
<td>96% (166/173)</td>
<td>--</td>
</tr>
<tr>
<td>TURQUOISE-II (1a)</td>
<td>89% (124/140)</td>
<td>95% (115/121)</td>
</tr>
<tr>
<td>TURQUOISE-II (1b)</td>
<td>99% (67/68)</td>
<td>--</td>
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</tbody>
</table>

**SAPPHIRE-1**: A 96% SVR rate was observed at 12 weeks post-treatment, with 308 out of 322 patients achieving SVR.

**SAPPHIRE-II**: Similar results were observed in SAPPHIRE-II with a 96% SVR rate at 12 weeks, with 166 out of 173 patients achieving SVR.

**TURQUOISE-II (1a)**: A 89% SVR rate was observed at 12 weeks, with 124 out of 140 patients achieving SVR. Further, a 95% SVR rate at 24 weeks was observed for 115 out of 121 patients.

**TURQUOISE-II (1b)**: The highest SVR rate was observed in TURQUOISE-II (1b), with 99% of 67 patients achieving SVR.

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*VIEKIRA PAK™ [prescribing information]. North Chicago, IL: AbbVie, Inc; 2014.*
Ombitasvir/Paritaprevir/Ritonavir + Dasabuvir

- **The Bottom Line...**
  - Twice daily dosing with high pill burden
  - Concomitant ribavirin required in high risk patients
  - Use in HIV co-infected patients?
  - MANY drug interactions
  - $100,000 for 12 week course
Peramivir (Rapivab™)

*New Antiviral for Influenza*
Peramivir (Rapivab™)

- **Drug Class**
  - Neuraminidase inhibitor

- **Mechanism of Action**
  - Inhibits influenza virus replication by blocking neuraminidase enzyme

- **FDA Indication**
  - Treatment of acute uncomplicated influenza in adult patients who have been symptomatic for no more than 2 days

http://www.rapivab.com/
Peramivir

- **How Supplied**
  - Single-use vial
  - 200 mg in 20 mL

- **Dosage**
  - 600 mg IV x 1 dose
  - 200 mg IV x 1 dose if CrCl 30-49 mL/min
  - 100mg IV x 1 dose if CrCl 10-29 mL/min

http://www.biocryst.com/
Peramivir

- **Precautions**
  - Serious skin/hypersensitivity reactions
  - Neuropsychiatric events

- **Contraindications**
  - None

- **Drug Interactions**
  - Live attenuated influenza vaccine
Peramivir

- Pregnancy Category C

- Adverse Effects
  - Skin hypersensitivity reactions
  - Diarrhea
  - Neutropenia
  - Elevated serum glucose
Peramivir Study Data

- **Acute uncomplicated influenza**
  - Peramivir 300 mg vs 600 mg vs placebo (n=297)
  - Alleviation of symptoms a median of 21 hours sooner in peramivir 600 mg group versus placebo

- **Serious influenza requiring hospitalization**
  - Peramivir 600 mg daily x 5 days vs standard care
  - No improvement in time to clinical resolution

Peramivir

**The Bottom Line…**
- Single IV dose
- Not shown to provide benefit in patients with serious influenza requiring hospitalization
- ~$1000 per dose
<table>
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<tr>
<th>BRAND</th>
<th>GENERIC</th>
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<tr>
<td>Entyvio</td>
<td>Vedolizumab</td>
<td>Crohn’s and UC</td>
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<tr>
<td>Plegridy</td>
<td>Peginterferon Beta-1A</td>
<td>Relapsing MS</td>
</tr>
<tr>
<td>Esbriet</td>
<td>Pirfenidone</td>
<td>Idiopathic Pulmonary Fibrosis</td>
</tr>
<tr>
<td>Ofev</td>
<td>Nintedanib</td>
<td>Idiopathic Pulmonary Fibrosis</td>
</tr>
</tbody>
</table>
Vedolizumab (Entyvio®)
New Biologic for Ulcerative Colitis & Crohn’s Disease
Vedolizumab (Entyvio®)

- **Drug Class**
  - Integrin receptor antagonist

- **Mechanism of Action**
  - Inhibits T-lymphocyte migration by binding α4β7 integrin

- **FDA Indications**
  - Moderately to severely active ulcerative colitis
  - Moderately to severely active Crohn’s disease

http://www.entyvio.com/
Vedolizumab

- **Dosage**
  - 300 mg IV at 0, 2, and 6 weeks, then every 8 weeks thereafter

- **Pregnancy Category B**

- **Adverse Effects**
  - Hypersensitivity reactions
  - Nasopharyngitis
  - Headache
  - Arthralgias
  - Nausea
  - Pyrexia
  - Upper respiratory tract infections
  - Fatigue
  - Cough

Vedolizumab Study Data

- **GEMINI 1**
  - Patients with unsuccessful treatment of UC
  - 47% response at Week 6 vs 26% with placebo
  - 42% remission at Week 52 vs 16% with placebo

- **GEMINI 2**
  - Patients with unsuccessful treatment of CD
  - 15% remission at Week 6 vs 7% with placebo
  - 39% remission at Week 52 vs 22% with placebo
Peginterferon Beta-1A (Plegridy™)

New Agent for Multiple Sclerosis
Peginterferon Beta-1A (Plegridy™)

- **Drug Class**
  - Pegylated interferon beta

- **Mechanism of Action**
  - Unknown

- **FDA Indication**
  - Relapsing multiple sclerosis

http://www.plegridy.com/
Peginterferon Beta-1A

- **How Supplied**
  - 63, 94, and 125 mCg/0.5 mL single-dose prefilled syringes and pens

- **Dosage**
  - 63 mCg SubQ on Day 1
  - 94 mCg SubQ on Day 15
  - 125 mCg SubQ on Day 29 and every 14 days thereafter
Peginterferon Beta-1A

- **Precautions**
  - Hepatic injury
  - Depression and suicide
  - Seizure
  - Anaphylactic reactions
  - Worsening of CHF
  - Decreased peripheral blood counts

- **Pregnancy Category C**
Peginterferon Beta-1A

- **Adverse Effects**
  - Headache
  - Myalgia and arthralgia
  - Injection site reactions
  - Pyrexia, chills, and influenza-like illness

- **Patient Education**
  - Proper SubQ injection technique
  - Analgesics and antipyretics on treatment days may help ameliorate flu-like symptoms
Peginterferon Beta-1A Study Data

- **ADVANCE**
  - 1012 patients with relapsing multiple sclerosis
    - At least 1 relapse in the previous year
    - At least 2 relapses in the previous 3 years
  - Outcomes at 48 weeks
    - 36% relative reduction in annualized relapse rate (0.26 vs 0.40)
    - 67% relative reduction in new or newly enlarging lesions on MRI (3.6 vs 10.9)
Pirfenidone (Esbriet®)
Nintedanib (Ofev®)

New Idiopathic Pulmonary Fibrosis Agents
Pirfenidone (Esbriet®)

- **Drug Class**: *Pyridone*
- **Mechanism of Action**: Not established
- **FDA Indications**: Idiopathic pulmonary fibrosis

Pirfenidone

- **How Supplied**
  - 267 mg capsules

- **Dosage**
  - 1 capsule PO three times daily with food x 7 days
  - 2 capsules PO three times daily with food x 7 days
  - 3 capsules PO three times daily with food

  Use with caution in renal impairment
  Not recommended in ESRD
Pirfenidone

- **Precautions**
  - Elevated liver enzymes
  - Photosensitivity and rash
  - Gastrointestinal disorders

- **Drug Interactions**
  - CYP1A2 inhibitors and inducers
  - Smoking

- **Pregnancy Category C**
Pirfenidone

- **Adverse Effects**
  - Nausea
  - Abdominal pain
  - Diarrhea
  - Rash
  - Fatigue
  - Headache

- **Patient Education**
  - Avoid or minimize exposure to sunlight
  - Report persistent GI effects
  - Take with food
  - Stop smoking

ESBRIET®[prescribing information]. Brisbane, CA: InterMune, Inc; 2014.
Pirfenidone Study Data

- **ASCEND and CAPACITY 1 & 2**
  - 1247 patients with IPF
  - Statistically significant treatment effect on change in %FVC from baseline to study end in ASCEND and CAPACITY 2
  - No significant impact on mortality
Nintedanib (Ofev®)

- **Drug Class**
  - Kinase inhibitor

- **Mechanism of Action**
  - Inhibits multiple tyrosine kinases, blocking proliferation, migration, and transformation of fibroblasts

- **FDA Indication**
  - Idiopathic pulmonary fibrosis

OFEV® [prescribing information]. Ridgefield, CT: Boehringer Ingelheim Pharmaceuticals, Inc; 2014.
Nintedanib

- **How Supplied**
  - 100 mg and 150 mg capsules

- **Dosage**
  - 150 mg PO twice daily
  - Temporary dose reduction to 100 mg may be considered for management of ADRs
Nintedanib

**Precautions**
- Elevated liver enzymes
- Gastrointestinal disorders
- Embryofetal toxicity
- Arterial thromboembolic events
- Bleeding risk

**Drug Interactions**
- CYP3A4 and P-gp inhibitors
- Smoking

**Pregnancy Category D**
Nintedanib

- **Adverse Effects**
  - Diarrhea
  - Nausea/vomiting
  - Abdominal pain
  - Decreased appetite
  - Liver enzyme elevation

- **Patient Education**
  - Swallow whole
  - Report persistent GI effects
  - Adequate contraception
  - Stop smoking

OFEV® [prescribing information]. Ridgefield, CT: Boehringer Ingelheim Pharmaceuticals, Inc; 2014.
Nintedanib Study Data

- **INPULSIS 1 & 2**
  - 1066 patients with IPF
  - ~ 50% reduction in the annual rate of decline in FVC
  - Significant decrease in time to first acuter IPF exacerbation in INPULSIS 2
  - No significant impact on mortality
<table>
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<tr>
<th>BRAND</th>
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<th>INDICATION</th>
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<tr>
<td>Cyramza</td>
<td>Ramucirumab</td>
<td>Stomach cancer</td>
</tr>
<tr>
<td>Zykadia</td>
<td>Ceritinib</td>
<td>Metastatic NSCLC</td>
</tr>
<tr>
<td>Beleodaq</td>
<td>Belinostat</td>
<td>Peripheral T-cell Lymphoma</td>
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<tr>
<td>Zydelig</td>
<td>Idelalisib</td>
<td>Blood cancers</td>
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<tr>
<td>Keytruda</td>
<td>Pembrolizumab</td>
<td>Melanoma</td>
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<tr>
<td>Blincyto</td>
<td>Blinatumomab</td>
<td>ALL</td>
</tr>
<tr>
<td>Lynparza</td>
<td>Olaparib</td>
<td>Ovarian cancer</td>
</tr>
<tr>
<td>Opdivo</td>
<td>Nivolumab</td>
<td>Melanoma</td>
</tr>
</tbody>
</table>
Ramucirumab (Cyramza™)

- **Drug Class/Mechanism**
  - Human VEGF Receptor 2 antagonist

- **Indications**
  - Advanced gastric or gastro-esophageal junction adenocarcinoma (+/- paclitaxel)
  - Metastatic NSCLC (+ docetaxel)

- **Dosing**
  - Gastric Cancer: 8 mg/kg IV every 2 weeks
  - NSCLC: 10 mg/kg on day 1 of a 21 day cycle

- **Adverse Effects**
  - Hypertension, diarrhea
  - Arterial thromboembolic events

**BLACKBOX WARNING**

Hemorrhage

CYRAMZA™[prescribing information]. Indianapolis, IN: Eli Lilly and Company; 2014.
Ceritinib (Zykadia™)

- **Drug Class/Mechanism**
  - Kinase inhibitor

- **Indication**
  - ALK-positive metastatic NSCLC in patients who have progressed on or are intolerant to crizotinib

- **Dosing**
  - 750 mg PO once daily on an empty stomach

- **Adverse Effects**
  - Diarrhea, nausea, elevated transaminases, fatigue
  - QTc prolongation, bradycardia, hyperglycemia

http://www.us.zykadia.com/
Belinostat (Beleodaq®)

- **Drug Class/Mechanism**
  - Histone deacetylase inhibitor

- **Indication**
  - Relapsed or refractory peripheral T-cell lymphoma

- **Dosing**
  - 1000 mg/m² IV once daily on days 1-5
  - 21-day cycle; repeat until progression or toxicity

- **Adverse Effects**
  - Nausea, fatigue, pyrexia, anemia, vomiting

http://www.beleodaq.com/
Idelalisib (Zydelig™)

- **Drug Class/Mechanism**
  - Kinase inhibitor

- **Indications**
  - Relapsed chronic lymphocytic leukemia (+ rituximab)
  - Relapsed follicular B-cell non-Hodgkin lymphoma
  - Relapsed small lymphocytic lymphoma

- **Dosing**
  - 150 mg PO twice daily

- **Adverse Effects**
  - Diarrhea, pyrexia, fatigue
  - Neutropenia, hyperglycemia

ZYDELIG™ [prescribing information]. Foster City, CA: Gilead Sciences, Inc; 2014.
Pembrolizumab (Keytruda®)

- **Drug Class/Mechanism**
  - *Human programmed death receptor-1-blocking antibody*

- **Indication**
  - Unresectable or metastatic melanoma

- **Dosing**
  - 2 mg/kg IV every 3 weeks

- **Adverse Effects**
  - Fatigue, cough, nausea, pruritis, rash, arthralgias
  - Immune-mediated pneumonitis, colitis, nephritis

http://www.keytruda.com/
Nivolumab (Opdivo™)

- **Drug Class/Mechanism**
  - Human programmed death receptor-1 blocking antibody

- **Indication**
  - Unresectable or metastatic melanoma

- **Dosing**
  - 3 mg/kg IV every 2 weeks

- **Adverse Effects**
  - Rash
  - Immune-mediated pneumonitis, colitis, nephritis

http://www.opdivo.bmscustomerconnect.com/
Blinatumomab (Blincyto™)

- **Drug Class/Mechanism**
  - *Bispecific CD19-directed CD3 T-cell engager*

- **Indication**
  - PHL-negative relapsed or refractory B-cell precursor acute lymphoblastic leukemia

- **Dosing**
  - 4 week continuous infusion
  - 9 mCg/day on days 1-7
  - 28 mCg/day on days 8-28

- **Adverse Effects**
  - Pyrexia, headache, tremor, rash
  - Infection risk

http://www.blincyto.com/
Olaparib (Lynparza™)

- **Drug Class/Mechanism**
  - *Poly (ADP-ribose) polymerase inhibitor*

- **Indication**
  - Advanced ovarian cancer

- **Dosing**
  - 400 mg PO twice daily

- **Adverse Effects**
  - Anemia, nausea, fatigue, vomiting, diarrhea, headache, cough, myalgia, rash

[LYNPARZA™ prescribing information]. Wilmington, DE: AstraZeneca Pharmaceuticals LP; 2014.
New Drugs for Rare Diseases
- **Elosulfase alfa (Vimizim®)**
  - *Hydrolytic lysosomal enzyme* for treatment of Morquio A Syndrome

- **Metreleptin (Myalept®)**
  - *Leptin analog* for treatment of generalized lipodystrophy due to leptin deficiency

- **Miltefosine (Impavido®)**
  - *Antileishmanial agent* for treatment of visceral, cutaneous, and mucosal leishmaniasis
- **Siltuximab (Sylvant™)**
  - *Interleukin-6 antagonist* for treatment of multicentric Castleman’s disease

- **Eliglustat (Cerdelga™)**
  - *Glucosylceramide synthase inhibitor* for treatment of Gaucher Disease
New Formulations & Combinations
- **Posaconazole (Noxafil®)**
  - Intravenous formulation for prophylaxis against invasive *Aspergillus* and *Candida* infections in immunocompromised patients

- **Mercaptopurine (Purixan™)**
  - Oral suspension for treatment of acute lymphoblastic leukemia

- **Dantrolene sodium (Ryanodex®)**
  - Injectable suspension for prevention and treatment of malignant hyperthermia
- **Elvitegrevir (Vitekta™)**
  - Single ingredient formulation of the integrase strand transfer inhibitor for HIV

- **Cobicistat (Tybost®)**
  - Single ingredient formulation of the CYP3A4 inhibitor used to increase systemic exposure to certain HIV medications

- **Dolutegravir + Abacavir + Lamivudine (Triumeq®)**
  - Integrase strand inhibitor/NRTI combination for HIV
Amino acids, electrolytes, dextrose, and lipid emulsion (Kabiven® and Perikabiven®)

Three-chamber bag formulation for total parenteral nutrition

The Kabiven three-chamber bag has the components clinicians have relied on for years

- **DEXTROSE**
  Provides a moderate dose of carbohydrates

- **AMINO ACIDS AND ELECTROLYTES**
  A source of essential and nonessential amino acids and balanced electrolytes

- **LIPIDS (INTRALIPID®)**
  A reliable source of lipids used worldwide for 50 years; registered in the US since 1975
Questions?