



# **ARIZONA** **HEALTH CARE COST** **CONTAINMENT SYSTEM**

## **AHCCCS Pharmacy and Therapeutics Committee**

January 13, 2026

# Welcome and Introductions

- Suzi Berman, RPh, Pharmacy Director, AHCCCS
  - Minutes Review and Vote - P&T October 22, 2025
  - Review
  - Vote

# Prime Therapeutics Class Reviews

## *Classes for Review: Non-Supplemental Rebate Classes*

- Antidepressants, Other
- Antidepressants, SSRIs
- Antivirals, Topical
- Bladder Relaxant Preparations
- Bone Resorption Suppression and Related Agents
- Bronchodilators, Beta Agonists
- Enzyme Replacement, Gaucher Disease
- Hypoglycemics, Metformins
- Hypoglycemics, SGLT2s
- Immune Globulins
- NSAIDs
- Oncology, Oral - Hematologic
- Ophthalmics, Anti-inflammatory/Immunomodulators
- Otic Antibiotics
- Thrombopoiesis Stimulating Agents
- Ulcerative Colitis

# Prime Therapeutics Class Reviews

## *Classes for Review: Supplemental Rebate Classes*

- Hereditary Angioedema Treatments
- Pituitary Suppressive Agents, LHRH

# Non-Supplemental Rebate Drug Class Review

Hind Douiki, PharmD





# Antidepressants, Other

# Antidepressants, Other



Drug	Manufacturer	Major Depressive Disorder (MDD)	Generalized Anxiety Disorder (GAD)	Social Anxiety Disorder (SAD)	Panic Disorder	Other Indications
bupropion HBr ER (Aplenzin)	Bausch	X	--	--	--	prevention of seasonal major depressive episodes associated with seasonal affective disorder
bupropion HCl ER (Forfivo XL)	generic, Almatica	X	--	--	--	--
bupropion HCl ER (Wellbutrin XL)	generic, Bausch	X	--	--	--	prevention of seasonal major depressive episodes associated with seasonal affective disorder
bupropion HCl IR	generic	X	--	--	--	--
bupropion HCl SR (Wellbutrin SR)	generic, GlaxoSmithKline	X	--	--	--	--
desvenlafaxine ER base	Ranbaxy/Sun	X	--	--	--	--
desvenlafaxine succinate ER (Pristiq)	generic, Wyeth/Pfizer	X	--	--	--	--
dextromethorphan HBr/bupropion ER (Auvelity)	Axsome	X	-	-	-	-
duloxetine HCl DR (Cymbalta)	generic, Eli Lilly	X	X	--	--	diabetic peripheral neuropathic pain; fibromyalgia; chronic musculoskeletal pain
duloxetine HCl DR* (Drizalma Sprinkle)	Sun	X	X	--	--	diabetic peripheral neuropathic pain; fibromyalgia; chronic musculoskeletal pain

# Antidepressants, Other

Drug	Manufacturer	Major Depressive Disorder (MDD)	Generalized Anxiety Disorder (GAD)	Social Anxiety Disorder (SAD)	Panic Disorder	Other Indications
esketamine (Spravato)	Janssen	X treatment-resistant depression (TRD); depressive symptoms with acute suicidal ideation or behavior	--	--	--	--
isocarboxazid (Marplan)	Validus	X 2 <sup>nd</sup> line therapy	--	--	--	--
Levomilnacipran (Fetzima)	Allergan/Forest	X	--	--	--	--
mirtazapine tablet and ODT (Remeron; Remeron SolTab)	generic, Merck, Organon	X	--	--	--	--
nefazodone	Teva	X	--	--	--	--
phenelzine (Nardil)	Greenstone, Pfizer	X 2 <sup>nd</sup> line therapy	--	--	--	--
selegiline (Emsam)	Mylan Specialty	X	--	--	--	--
tranylcypromine (Parnate)	generic, Concordia	X 2 <sup>nd</sup> line therapy	--	--	--	--
trazodone	generic	X	--	--	--	--
esketamine (Spravato)	Janssen	X treatment-resistant depression (TRD); depressive symptoms with acute suicidal ideation or behavior	--	--	--	--

# Antidepressants, Other

Drug	Manufacturer	Major Depressive Disorder (MDD)	Generalized Anxiety Disorder (GAD)	Social Anxiety Disorder (SAD)	Panic Disorder	Other Indications
venlafaxine besylate ER (Venlafaxine Besylate ER)	Almatica	X	X	--	--	--
venlafaxine HCl IR	generic	X	--	--	--	--
venlafaxine HCl ER capsule (Effexor XR)	generic, Pfizer/Viatris	X	X	X	X	--
venlafaxine HCl ER tablet (Venlafaxine ER)	generic	X	--	X	--	--
vilazodone HCl (Viibryd)	generic, Allergan	X	--	--	--	--
vortioxetine (Trintellix)	Takeda	X	--	--	--	--
zuranolone (Zurzuvae)	Biogen	--	--	--	--	postpartum depression
venlafaxine besylate ER (Venlafaxine Besylate ER)	Almatica	X	X	--	--	--
venlafaxine HCl IR	generic	X	--	--	--	--
venlafaxine HCl ER capsule (Effexor XR)	generic, Pfizer/Viatris	X	X	X	X	--

# Antidepressants, Other

- In 2025, about 18.3% of the adult population in the US, which translates to about 48 million adults have reported experiencing depression
- The prevalence of depression among adolescents (ages 12 to 17 years) in 2025 was around 19%
- Generalized anxiety disorder (GAD) and social anxiety disorder (SAD) affect about 6.8 million and 15 million adults in the US, respectively
- It is estimated that panic disorder will affect 4.7% of adults in the US during their lifetime

# Antidepressants, Other

- American College of Physicians (ACP) published a 2023 guideline on nonpharmacologic and pharmacologic treatments of adults in the acute phase of Major Depressive Disorder (MDD)
- The guideline states that patients with acute mild MDD should initiate Cognitive behavioral Therapy (CBT) as initial treatment
- Patients with acute moderate or severe MDD undergo monotherapy with either CBT or a second-generation antidepressant (e.g., SSRI, SNRI, bupropion, mirtazapine, nefazodone, trazodone, vilazodone, vortioxetine)
- Combination therapy with CBT and a second-generation antidepressant can be considered as initial therapy for certain patients with moderate to severe MDD

# Antidepressants, Other

- The American Academy of Child and Adolescent Psychiatry (AACAP) published a 2023 guideline for the assessment and treatment of children and adolescents with MDD
- AACAP suggests the use of a SSRI, particularly fluoxetine and excluding paroxetine, as an option for children and adolescents with MDD
- Combination therapy with CBT and fluoxetine could also be offered to this patient population
- The 2023 World Federation of Societies of Biological Psychiatry (WFSBP) guidelines recommend SSRIs and SNRIs as first-line therapies for the treatment of anxiety, obsessive-compulsive, and post-traumatic stress disorders in primary care

# Antidepressants, Other

- Per the 2016 ACP guidelines, treatment with either CBT or second-generation antidepressants for major depressive disorder (MDD) is recommended
- The 2010 American Psychiatric Association (APA) treatment guideline recommend an SSRI, SNRI, mirtazapine, or bupropion as appropriate for initial treatment for MDD
- The 2009 APA treatment guidelines for panic disorder recommend SSRIs, SNRIs, TCAs, and benzodiazepines as first-line pharmacotherapy

# Antidepressants, Other

- SSRIs are used most often for the treatment of children with MDD
- Non-SSRI antidepressants are used as first-line therapy in children in the presence of comorbidities, such as attention-deficit/hyperactivity disorder (ADHD), where bupropion may be more effective than a SSRI
- All antidepressants, with the exception of zuranolone (Zurzuvae), have a boxed warning regarding suicidality in children, adolescents, and young adults
- Tranylcypromine (Parnate) carries a boxed warning informing that excessive consumption of foods or beverages that contain significant amounts of tyramine can precipitate hypertensive crisis

# Antidepressants, Other

- Esketamine (Spravato) carries a boxed warning for risk of dissociation and sedation after administration as well as abuse and misuse; it is a Schedule III controlled substance
- Use of esketamine (Spravato) requires enrollment in the Spravato REMS program
- Dextromethorphan/bupropion (Auvelity) has not been addressed in treatment guidelines
- Pharmacotherapy should be selected based on adverse event profiles, comorbidities, drug interactions, pharmacokinetics, patient preference, cost, and historical patient response
- For GAD, the International Consensus Group on Depression and Anxiety (ICGDA) recommends SSRIs, SNRIs, TCAs, and CBT as first-line treatments

# Antidepressants, Other

- The North American Menopause Society and National Network of Depression Centers published consensus guidelines for the treatment of perimenopausal depression in 2018
- They note that SSRIs and SNRIs, particularly desvenlafaxine, have been shown to improve menopause-associated symptoms
- The Endocrine Society (ES) recommends SSRIs, SNRIs, gabapentin, or pregabalin for moderate to severe vasomotor symptoms (VMS) in patients with contraindications to hormone therapy or who choose not to use hormone therapy
- The American College of Obstetricians and Gynecologists (ACOG) also states SSRIs, SNRIs, clonidine, and gabapentin are effective alternatives to hormone therapy for the treatment of VMS related to menopause

# Antidepressants, Other

- For the treatment perinatal depression, ACOG recommends SSRIs as first-line pharmacotherapy
- Zuranolone (Zurzuvae) carries a boxed warning for impaired ability to drive or engage in other potentially hazardous activities; it is a Schedule IV controlled substance
- Due to the date of publication, ACOG clinical practice guidelines do not address the role of zuranolone (Zurzuvae) in the management of postpartum depression
- Treatment-resistant depression occurs in approximately 20% to 30% of patients with MDD
- When response is inadequate with trial of a first-line therapy, strategies for treatment include maximizing the dose, switching to another class or another drug within the class, combination therapy, augmentation, or other nonpharmacologic therapy

# Antidepressants, Other

## *Clinical and Product Updates*

- REMS for esketamine (Spravato) was modified to add the risk of respiratory depression
- Healthcare settings are required to have a pulse oximeter to monitor patients onsite
- Indication for esketamine (Spravato) for adults for treatment-resistant depression has been expanded to include use as monotherapy



# Antidepressants, SSRIs

# Antidepressants, SSRIs

Drug	Mfr	MDD	GAD	SAD	Panic Disorder	PTSD	OCD	PMDD	Bulimia Nervosa	VMS
citalopram (Celexa)	generic, Allergan	X	--	--	--	--	--	--	--	--
escitalopram (Lexapro)	generic, Allergan	X (≥ 12 years)	X (≥ 7 years)	--	--	--	--	--	--	--
fluoxetine	generic, Alvogen	X (≥ 8 years)	--	--	X	--	X (≥ 7 years)	--	X	--
fluoxetine (Prozac)	generic, Dista	X (≥ 8 years)	--	--	X	--	X (≥ 7 years)	--	X	--
fluoxetine DR	Dr. Reddy's	X	--	--	--	--	--	--	--	--
fluvoxamine	generic	--	--	--	--	--	X (≥ 8 years)	--	--	--
fluvoxamine ER	generic	--	--	--	--	--	X	--	--	--

# Antidepressants, SSRIs

Drug	Mfr	MDD	GAD	SAD	Panic Disorder	PTSD	OCD	PMDD	Bulimia Nervosa	VMS
paroxetine HCl (Paxil)	generic, Apotex	X	X	X	X	X	X	--	--	--
paroxetine HCl controlled release (Paxil CR)	generic, Apotex	X	--	X	X	--	--	X	--	--
paroxetine mesylate	Solco, Padagis	--	--	--	--	--	--	--	--	X
paroxetine mesylate (Pexeva)	Sebela	X	X	--	X	--	X	--	--	--
sertraline	Almatica	X	--	--	--	--	X (≥ 6 years)	--	--	--
sertraline (Zoloft)	generic, Pfizer/ Viatris	X	--	X	X	X	X (≥ 6 years)	X	--	--

# Antidepressants, SSRIs

- SSRIs are generally considered first-line therapy for their FDA-approved indications
- SSRIs have comparable efficacy and adverse event profiles for their FDA-approved indications
- SSRIs are preferred as a first medication trial for OCD and are recommended first-line medications for the treatment of PTSD
- For SAD, the ICGDA expert panel guidelines recommend SSRIs as first-line therapy

# Antidepressants, SSRIs

- The 2020 AACAP recommend SSRIs are first-line agents for the treatment of anxiety disorders in children 6-18 years old
- Fluoxetine (Prozac) is the only SSRI medication approved by the FDA for the treatment of bulimia and has been shown to reduce the episodes of binge-eating and purging behavior, and their chance of relapse
- It is recommended first-line in the 2023 APA eating disorder guidelines
- The American Association of Clinical Endocrinologists (AACE) states that therapeutic trials of SSRIs and possibly other nonhormonal medications may be considered for the relief of menopausal symptoms in women with no specific contraindications
- Paroxetine mesylate (Brisdelle) is the only SSRI approved to treat VMS

# Antidepressants, SSRIs

## *Clinical and Product Updates*

- FDA approved escitalopram *capsule* 15 mg for treatment of MDD in pts 12 to < 65 yo and generalized anxiety disorder in adults < 65 yo
- Another escitalopram product should be used for dosage initiation, titration, dosages other than 15 mg once daily, and for discontinuation



# Antivirals, Topical

# Antivirals, Topical

Drug	Manufacturer	Indications
acyclovir cream (Zovirax)	generic, Bausch	Treatment of recurrent herpes labialis (cold sores) in immunocompetent adults and children 12 years of age and older
acyclovir ointment (Zovirax)	generic, Bausch	Management of initial genital herpes and in limited non-life-threatening mucocutaneous herpes simplex virus infections in immunocompromised adult patients
acyclovir/ hydrocortisone (Xerese)	Bausch	Early treatment of recurrent herpes labialis (cold sores) to reduce the likelihood of ulcerative cold sores and to shorten the lesion healing time in adults and children 6 years of age and older
docosanol (Abreva)	generic, <a href="#">Haleon</a>	Treatment of cold sores/fever blisters on the face or lips in adults and children 12 years of age and older to shorten healing time and duration of symptoms
penciclovir (Denavir)	generic, Mylan	Treatment of recurrent herpes labialis (cold sores) in adults and children 12 years of age and older

# Antivirals, Topical

- In the US, about 48% of people aged 14 to 49 years have serologic infection with HSV-1 and 12% are seropositive for HSV-2
- 30% to 40% of genital herpes in adolescent patients is caused by HSV-1
- The HSV-1 and HSV-2 viruses become reactivated secondary to certain stimuli
- Topical antiviral medications are used for the treatment of an active lesion and should be started during the prodrome phase, characterized by perioral tingling, itching, and redness, to be most beneficial
- Overall, acyclovir, penciclovir, and docosanol for herpes labialis treatment only provide modest benefit if used very early in the prodrome phase

# Antivirals, Topical

- Compared to placebo, treatment has reduced lesion healing time by approximately 0.75 to 1.5 days in clinical trials
- Left untreated, herpes labialis may take up to 10 days or more to heal
- According to studies, all products are effective in treating herpes labialis and provide symptom relief compared to placebo
- The 2021 Centers for Disease Control and Prevention (CDC) sexually-transmitted infections (STI) recommendations for genital herpes state oral antiviral therapy is preferred over topical antiviral therapy



# Bladder Relaxant Preparations

# Bladder Relaxant Preparations

Drug	Manufacturer	Indication(s)
darifenacin	generic	Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and frequency
fesoterodine extended-release (ER) (Toviaz®)	generic, Pfizer	Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and frequency in adults; Treatment of neurogenic detrusor overactivity (NDO) in pediatric patients $\geq$ 6 years old with a body weight $> 25$ kg
mirabegron ER (Myrbetriq®)	Astellas	Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and urinary frequency in adults; Treatment of overactive bladder with symptoms or urge urinary incontinence, urgency, and urinary frequency in combination solifenac in adults; Treatment of NDO in pediatric patients aged $\geq$ 3 years (tablets are only indicated in patients weighing $\geq$ 35 kg)
oxybutynin	generic	Relief of symptoms of bladder instability associated with voiding in patients with uninhibited neurogenic or reflex neurogenic bladder (e.g., urgency, frequency, urinary leakage, urge incontinence, dysuria)
oxybutynin ER	generic	Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and frequency; Treatment of pediatric patients aged $\geq$ 6 years with symptoms of detrusor overactivity associated with a neurological condition (e.g., spina bifida)
oxybutynin transdermal (Oxytrol® [Rx], Oxytrol® for Women [OTC])	Allergan (Rx); Allergan, Bayer, MSD Consumer (OTC)	Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and frequency Oxytrol for Women is only approved for women $\geq$ 18 years of age

# Bladder Relaxant Preparations

Drug	Manufacturer	Indication(s)
<u>solifenacina</u> ( <u>Vesicare®</u> )	generic, Astellas	Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and urinary frequency
solifenacina (Vesicare LS®)	Astellas	Treatment of NDO in pediatric patients aged $\geq$ 2 years
tolterodina ( <u>Detrol®</u> )	generic, Pfizer/Viatris	Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and frequency
tolterodina ER ( <u>Detrol® LA</u> )	generic, Pfizer/Viatris	Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and frequency
trospium	generic	Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and urinary frequency
trospium ER	generic	Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and urinary frequency
vibegron (Gemtesa®)	Urovant Science	Treatment of overactive bladder with symptoms of urge urinary incontinence, urgency, and urinary frequency in adults Treatment of overactive bladder (OAB) with symptoms of urge urinary incontinence, urgency, and urinary frequency in adult males on pharmacological therapy for benign prostatic hyperplasia

# Bladder Relaxant Preparations

- Overactive Bladder (OAB) affects up to 33 million adults in the US, with prevalence estimates varying and is higher in women than in men
- In their amended 2019 guidelines, the American Urological Association (AUA) recommends behavioral therapy first-line
- Pharmacological therapy may also be combined with behavioral therapy as first-line treatment
- Oral antimuscarinics or beta-3 adrenergic receptor agonists should be offered as second-line therapy

# Bladder Relaxant Preparations

- When both an immediate release (IR) and extended release (ER) formulation are available, the ER formulations are preferred rather than IR formulations
- There may be consideration of combining an anti-muscarinic and beta-3 adrenergic receptor agonist in patients refractory to monotherapy
- In 2013, oxybutynin transdermal patch (Oxytrol for Women) became available for over-the-counter (OTC) use to treat OAB in women
- In comparative trials, oral oxybutynin formulations were as effective as the comparators but have been associated with greater incidences of anticholinergic adverse effects

# Bladder Relaxant Preparations

- The transdermal oxybutynin medications (Oxytrol, Oxytrol for Women) appear to cause fewer anticholinergic adverse effects but are associated with cutaneous reactions
- There are no published trials comparing mirabegron with the antimuscarinic agents
- The agents in this class may be considered therapeutically interchangeable and product selection may depend on individual patient requirements, response, and tolerance



# Bone Resorption Suppression and Related Agents

# Bone Resorption Suppression and Related Agents

Drug	Manufacturer	Indications
<b>Bisphosphonates</b>		
alendronate (Binosto)	Ascend, Radius Health	Treatment of osteoporosis in postmenopausal women Treatment to increase bone mass in men with osteoporosis
alendronate (Fosamax)	generic, Organon	Treatment and prevention of osteoporosis in postmenopausal women Treatment to increase bone mass in men with osteoporosis Treatment of glucocorticoid-induced osteoporosis in men and women receiving glucocorticoids in a daily dosage equivalent of $\geq 7.5$ mg of prednisone and who have low bone mineral density Treatment of Paget's disease of bone in men and women
alendronate/vitamin D (Fosamax Plus D)	Organon	Treatment of osteoporosis in postmenopausal women Treatment to increase bone mass in men with osteoporosis
ibandronate	generic	Treatment and prevention of osteoporosis in postmenopausal women
risedronate (Actonel)	generic, Actavis/Allergan	Treatment and prevention of osteoporosis in postmenopausal women Treatment to increase bone mass in men with osteoporosis Prevention and treatment of glucocorticoid-induced osteoporosis in men and women who are either initiating or continuing systemic glucocorticoids in a daily dosage equivalent of $\geq 7.5$ mg of prednisone for chronic diseases Treatment of Paget's disease of bone in men and women
risedronate delayed-release (Atelvia)	generic, Actavis/Allergan	Treatment of osteoporosis in postmenopausal women

# Bone Resorption Suppression and Related Agents

Drug	Manufacturer	Indications
<b>Calcitonins</b>		
calcitonin-salmon	generic	Treatment of postmenopausal osteoporosis in females > 5 years post menopause when alternative treatments are not suitable. Fracture reduction efficacy has not been demonstrated.
<b>Others</b>		
abaloparatide (Tymlos)	Radius Health	Treatment of osteoporosis in postmenopausal women who are at high risk for fracture, defined as a history of osteoporotic fracture or multiple risk factors for fracture, or in patients who have failed or are intolerant to other available osteoporosis therapy  Treatment to increase bone density in men with osteoporosis at high risk for fracture, defined as a history of osteoporotic fracture or multiple risk factors for fracture, or in patients who have failed or are intolerant to other available osteoporosis therapy
denosumab (Prolia®)	Amgen	Treatment of osteoporosis in postmenopausal women at high risk for fracture, defined as a history of osteoporotic fracture, or multiple risk factors for fracture, or in patients who have failed or are intolerant to other available osteoporosis therapy
denosumab-bbdz (Jubroni®)	Sandoz	Treatment of osteoporosis associated with newly initiated or sustained systemic glucocorticoid therapy at a dose $\geq 7.5$ mg daily of prednisone to be continued for at least 6 months in men and women at high risk for fracture
denosumab-bmwo (Stoboclo®)	Celltrion	
denosumab-bnht (Conexxence®)	Fresenius Kabi	Treatment of bone loss in men with prostate cancer on androgen deprivation therapy
denosumab-nxxp (Bildyos®)	Organon	Treatment of bone loss in women undergoing breast cancer therapy with adjuvant aromatase inhibitor therapy  Treatment to increase bone mass in men diagnosed with osteoporosis and a high fracture risk or in patients who have failed or are intolerant to other osteoporosis therapies

# Bone Resorption Suppression and Related Agents

Drug	Manufacturer	Indications
<b>Others (Cont'd)</b>		
raloxifene (Evista)	generic, Eli Lilly	Treatment and prevention of osteoporosis in postmenopausal women Reduction in risk of invasive breast cancer in postmenopausal women who either have osteoporosis or are at high risk for invasive breast cancer
romosozumab-aqqg (Evenity)	Amgen	Treatment of osteoporosis in postmenopausal women at high risk for fracture, defined as a history of osteoporotic fracture, or multiple risk factors for fracture; or patients who have failed or are intolerant to other available osteoporosis therapy
teriparatide (Bonsity <sup>®</sup> )*	generic, Alvogen	Treatment of osteoporosis in postmenopausal women who are at high risk for fracture or who have failed or are intolerant to other available osteoporosis therapy
teriparatide (Forteo <sup>®</sup> )	generic, Eli Lilly	Increase of bone mass in men with primary or hypogonadal osteoporosis who are at high risk for fracture or who have failed or are intolerant to other available osteoporosis therapy Treatment of men and women with osteoporosis associated with sustained systemic glucocorticoid therapy (daily dosage equivalent to $\geq$ 5 mg of prednisone) at high risk for fracture or who have failed or are intolerant to other available osteoporosis therapy

# Bone Resorption Suppression and Related Agents

- Approximately 12 million people in the US have a diagnosis of osteoporosis, and an additional 43 million have low bone mass
- Approximately 1 in 2 women and 1 in 4 men in the US > 50 years of age will have an osteoporosis-related fracture in their remaining lifetime
- The AACE and American College of Endocrinology (ACE) clinical practice guidelines for the diagnosis and treatment of postmenopausal osteoporosis (2020 update) recommend alendronate, risedronate, zoledronic acid, and denosumab as initial therapy for most patients at high risk of fracture
- Per the AACE/ACE, teriparatide, abaloparatide, denosumab, romosozumab, or zoledronic acid should be considered for patients unable to use oral therapy and as initial therapy for patients at especially high fracture risk

# Bone Resorption Suppression and Related Agents

- The Bone Health & Osteoporosis Foundation (BHOF) Clinician's Guide to prevention and treatment of osteoporosis recommends a "treat-to-target" approach to therapy
- The guide states that a therapy proven to reduce the risk of both vertebral and non-vertebral fractures (e.g., alendronate, risedronate, zoledronic acid, denosumab, teriparatide, abaloparatide, romosozumab) should be considered preferentially over a therapy that has not demonstrated vertebral and non-vertebral fracture risk reduction (e.g., raloxifene, calcitonin, ibandronate)
- Combination therapy with an anabolic agent (e.g., teriparatide, abaloparatide) and an anti-resorptive agent (e.g., bisphosphonate, denosumab) may be warranted for a patient at very high risk for fracture
- Calcitonin salmon should be reserved as second-line treatment for postmenopausal women when other drug therapies are not suitable

# Bone Resorption Suppression and Related Agents

- In 2023, ACP published guidelines for the treatment of low bone mass and primary osteoporosis to prevent fractures in adults
- ACP recommends physicians offer bisphosphonates for initial treatment of postmenopausal women with primary osteoporosis to reduce the risk of fractures and men with primary osteoporosis
- Denosumab is suggested second-line as an option in postmenopausal women or men with primary osteoporosis for whom bisphosphonates are not appropriate or who experience adverse effects with bisphosphonates
- In postmenopausal women with a very high risk of fracture, ACP suggests romosozumab or teriparatide followed by a bisphosphonate

# Bone Resorption Suppression and Related Agents

- According to the American College of Rheumatology's (ACR) 2022 updated guidance on managing glucocorticoid-induced osteoporosis in adults and children, treatment should include optimal calcium and vitamin D intake, as well as lifestyle changes consistent with good bone health
- ACR's recommendations on antiresorptive treatment are based on individual patient characteristics, including fracture risk, age, and special populations
- In patients with moderate to high risk of fracture, oral bisphosphonates are generally recommended as first-line therapy, per ACR
- Subsequent treatments may include IV bisphosphonates, teriparatide, denosumab, and raloxifene

# Bone Resorption Suppression and Related Agents

- The ES 2020 guidelines on osteoporosis recommend pharmacologic therapy for postmenopausal women at high risk of fracture, especially those with recent fracture
- These patients should be treated initially with a bisphosphonate or denosumab to reduce fracture risk
- Ibandronate is not recommended to reduce the risk of nonvertebral or hip fracture
- Denosumab is an alternative initial agent for patients at high risk of fracture
- For postmenopausal women with a very high risk of fracture, these guidelines recommend starting with either teriparatide or abaloparatide for up to 2 years of treatment before switching to a bisphosphonate or denosumab to maintain bone density

# Bone Resorption Suppression and Related Agents

- These guidance also included Evenity, which was concluded to be a potential treatment option for select postmenopausal women at very high risk of fracture, but patients should be carefully evaluated due to the serious potential cardiovascular events
- After completing a course of Evenity, it is recommended that patients receive treatment with antiresorptive therapies to maintain gains in bone density and reductions in fracture risk
- Raloxifene may be considered in patients with a low risk of deep vein thrombosis (DVT) and a high risk of breast cancer
- Calcitonin is only recommended if patients cannot tolerate or are not appropriate candidates for treatment with other therapies

# Bone Resorption Suppression and Related Agents

- The North American Menopause Society (NAMS) 2021 statement on the management of osteoporosis endorses bisphosphonates, denosumab, teriparatide, abaloparatide, and romosozumab to treat postmenopausal women with osteoporosis
- In addition to nonpharmacologic treatments, supplements, and lifestyle modifications, the pharmacologic treatment should be based on the current Bone Mass Density () and fracture risk
- Raloxifene is recommended for the treatment of postmenopausal osteoporosis in women with a low risk of hip fracture, an elevated risk of breast cancer, and low risk of stroke and DVT

# Bone Resorption Suppression and Related Agents

- Calcitonin is not a first-line drug for postmenopausal osteoporosis treatment
- It is an option for women who cannot tolerate preferred therapies
- Bisphosphonates to reduce fracture risk in women with postmenopausal osteoporosis
- Denosumab for women with postmenopausal osteoporosis, including those at high risk of fracture
- Osteoanabolic therapies in women at very high risk of fracture, including those with prior/recent fractures, very low , and those who sustain fractures or lose while taking anti-remodeling therapy

# Bone Resorption Suppression and Related Agents

## Clinical and Product Updates

- The US Preventive Services Task Force (USPSTF) published final recommendations on screening for osteoporosis to prevent fractures
- The FDA has approved the following as interchangeable biosimilars to reference drug denosumab (Prolia):
  - denosumab-dssb (Ospomyyv)
  - denosumab-bmwo (Stoboclo)
  - denosumab-bnht (Conexxence)
  - denosumab-nxxp (Bildyos)
  - denosumab-qbde (Enoby)
  - denosumab-desu (Osvyrti)

# Bone Resorption Suppression and Related Agents

## Clinical and Product Updates

- The FDA has approved the following as interchangeable biosimilars to reference drug denosumab (Xgeva):
  - denosumab-dssb (Xbryk)
  - denosumab-bmwo (Osenvelt)
  - denosumab-bnht (Bomynta)
  - denosumab-nxxp (Bilprevda)
  - denosumab-gbde (Xtrenbo)
  - denosumab-desu (Jubereq)



# Bronchodilators, Beta Agonists

# Bronchodilators, Beta Agonists (Long Acting)

Drug	Manufacturer	Reversible Bronchospasm		Prevention of Exercise-Induced Bronchoconstriction	Chronic Obstructive Pulmonary Disease (COPD)	Age of Use (years)
		Prevention and Treatment	Relief			
arformoterol inhalation solution (Brovana)	generic, Sunovion, Lupin	--	--	--	X	≥ 18
formoterol inhalation solution (Perforomist)	generic, Mylan	--	--	--	X	≥ 18
olodaterol inhalation spray (Striverdi Respimat)	Boehringer Ingelheim	--	--	--	X	≥ 18
salmeterol DPI (Serevent Diskus)	GlaxoSmithKline	X	--	X	X	≥ 4

# Bronchodilators, Beta Agonists

Drug Name	Manufacturer	Reversible Bronchospasm		Prevention of Exercise-Induced Broncho-spasm	Chronic Obstructive Pulmonary Disease (COPD)	Age of Use (years)
		Prevention and Treatment	Relief			
<b>Short-Acting Inhalation Agents</b>						
albuterol DPI (ProAir RespiClick®, ProAir® Digihaler®)	Teva	X	X	X	—	≥ 4
albuterol HFA (ProAir® HFA Proventil® HFA Ventolin® HFA)	generic‡, GlaxoSmithKline	X	X	X	—	≥ 4
albuterol inhalation solution	generic	—	X	—	—	≥ 2
albuterol low-dose inhalation solution	generic	—	X	—	—	children 2 to 12 years and adolescents

# Bronchodilators, Beta Agonists

Drug Name	Manufacturer	Reversible Bronchospasm		Prevention of Exercise-Induced Bronchospasm	Chronic Obstructive Pulmonary Disease (COPD)	Age of Use (years)
		Prevention and Treatment	Relief			
<b>Short-Acting Inhalation Agents</b>						
levalbuterol HFA (Xopenex® HFA)	generic <sup>§</sup> , Lupin	X	–	–	–	≥ 4
levalbuterol inhalation solution (Xopenex)	generic	X	–	–	–	≥ 6
<b>Oral Agents</b>						
albuterol oral syrup	generic	–	X	–	–	≥ 2
albuterol oral tablets	generic, Mylan	–	X	–	–	≥ 6
terbutaline tablets	generic	–	X	–	X	≥ 12

# Bronchodilators, Beta Agonists

- Prevalence and incidence of asthma in the US is approximately 28 million individuals, 4.9 million of which are children
- It is estimated that the number of people with a Chronic Obstructive Lung Disease (COPD) diagnosis in the US is approximately 16 million
- Beta2-agonist bronchodilators are used for the treatment and prevention of bronchospasm associated with asthma, prophylaxis of exercise-induced bronchospasm (EIB), and in the treatment of COPD
- Mainstay of asthma therapy is the use of inhaled corticosteroids (ICS) alone or in combination with long-acting beta2-agonists (LABAs) as controller medications

# Bronchodilators, Beta Agonists

- These agents lead to improvements in symptoms, reducing the need for short-acting beta<sub>2</sub>-agonists (SABAs) for quick relief
- Due to the increased risk of severe exacerbations with regular or frequent use, short-acting beta agonist (SABA)-only treatment is no longer recommended
- For most asthma patients, treatment can be initiated with an as-needed low dose ICS-formoterol, daily low dose ICS, or low dose ICS taken whenever a SABA is taken

# Bronchodilators, Beta Agonists

- Delivery system selection as well as the patients' ability to properly use the device are important factors in the clinical success of bronchodilator therapy
- Metered dose inhalers (MDIs) are pressurized spray inhalers, available in suspension and solution
- Spacer chambers may be used with most MDIs to make them easier to use and help deliver a greater amount of medicine to the airway
- Dry-powder inhalers (DPIs) are breath-actuated devices that release the medicine in the form of a dry powder upon inhalation

# Bronchodilators, Beta Agonists

- Nebulizers may be the only viable alternative delivery system for certain children and for those unable to use inhalers
- Some delivery devices, (like Respimat devices), are not breath-activated, but still require coordination of actuation and inhalation
- Oral dosage forms of albuterol are less utilized than the inhaled forms due to systemic beta-adrenergic stimulation, especially in patients sensitive to these effects, such as those with cardiovascular disease
- Levalbuterol has similar efficacy to albuterol and there are no significant differences in adverse effects

# Bronchodilators, Beta Agonists

- In May 2019, the FDA removed the boxed warning from the labeling for indacaterol (Arcapta Neohaler), arformoterol (Brovana), formoterol (Perforomist), and olodaterol (Striverdi)
- The warning remains in the labeling of salmeterol (Serevent Diskus)  
- a boxed warning about a small, but significant, increased risk of life-threatening asthma episodes or asthma-related deaths when used as monotherapy

# Bronchodilators, Beta Agonists

- The American Academy of Allergy, Asthma, and Immunology (AAAAI) issued a practice parameter regarding EIB in 2016
- They state that SABAs should be prescribed to protect against EIB
- They state that a single dose of SABA, LABA, or both on an intermittent basis (e.g., < 4 times/week) may protect against or mitigate symptoms of EIB
- Prescribers should be cautious with daily use of inhaled beta-agonists, with or without an ICS, as this may lead to tolerance or decreased efficacy

# Bronchodilators, Beta Agonists

- In August 2020, Choosing Wisely, an initiative of the American Board of Internal Medicine (ABIM), released guidance for the management of pediatric asthma based on information from the American Academy of Pediatrics (AAP)
- They recommend a thorough evaluation of medication adherence, technique, and device appropriateness prior to stepping up asthma therapy in this patient population
- The guidance recommends against the use of LABA/ICS combination inhalers as initial therapy in pediatric patients with intermittent or mild persistent asthma
- They state that typically a single agent, such as a low-dose ICS or leukotriene modifier, is sufficient to maintain asthma control

## Bronchodilators, Beta Agonists

- In 2020, the American Thoracic Society (ATS) released additional guidelines for the pharmacologic management of COPD
- The panel strongly recommends the use of dual LABA/LAMA therapy over LABA or LAMA monotherapy in COPD patients who complain of exercise intolerance or dyspnea
- In patients who complain of dyspnea or exercise intolerance despite dual therapy with LABA/LAMA, the ATS suggests triple therapy (ICS/LABA/LAMA) in patients with a history of  $\geq 1$  exacerbations requiring hospitalization, oral steroids, or antibiotics in the past year

# Bronchodilators, Beta Agonists

- The ATS recommends against maintenance oral corticosteroid therapy in patients with frequent and severe exacerbations while on optimal therapy
- For patients receiving triple combination therapy who experience no exacerbations over the course of 1 year, the ATS suggests that ICS therapy may be discontinued

# Bronchodilators, Beta Agonists

- The 2025 GOLD guidelines place a great focus on the assessment of inhaler technique and adherence to improve therapeutic outcomes
- The National Asthma Education and Prevention Program (NAEPP) Expert Panel Report-3 (EPR-3) report released in 2007 by the National Heart, Lung, and Blood Institute (NHLBI) also recommends a similar classification of asthma severity and control to guide therapy
- A focused update to these guidelines was released in 2020
- As needed ICS with formoterol is recommended instead for patients 5 to 11 years of age at steps 3 and 4 (as low-dose or medium-dose, respectively); a SABA is recommended as an alternative
- For combinations of an ICS and a LABA for patients  $\geq 5$  years of age, the group states a single inhaler is preferable

# Bronchodilators, Beta Agonists

## 2025 GOLD Guidelines

### Assessment of Airflow Limitation:

- GOLD 1: mild,  $FEV_1 \geq 80\%$  predicted
- GOLD 2: moderate,  $FEV_1 50\%$  to  $79\%$  predicted
- GOLD 3: severe,  $FEV_1 30\%$  to  $49\%$  predicted
- GOLD 4: very severe,  $FEV_1 < 30\%$  predicted

### Assessment of Exacerbation Risk and Symptoms:

		Symptoms	
Moderate or Severe Exacerbation History		$mMRC \text{ grade 0 to 1; } CAT < 10$	$mMRC \text{ grade } \geq 2; \text{ } CAT \geq 10$
	0 to 1 moderate exacerbations per year (not leading to hospitalization)	Group A	Group B
	$\geq 2$ moderate exacerbations per year or $\geq 1$ exacerbation leading to hospitalization		Group E

# Bronchodilators, Beta Agonists

- The 2024 Global Initiative for Asthma (GINA) guidelines offer a control-based management plan to adjust treatment in a continuous cycle of assessment, treatment, and review of the patient's response
- In patients whose asthma is inadequately controlled on the preferred controller despite good adherence and correct inhaler technique, a step up in treatment may be utilized until control is achieved
- If control is maintained for at least 3 months on the current regimen, treatment can be stepped down to the lowest step that maintains control
- The GINA 2024 guidelines describe 2 treatment tracks: Track 1 and Track 2, with Track 1 being the preferred treatment and Track 2 being alternative

# Bronchodilators, Beta Agonists

## 2024 GINA Guidelines – Controller and Reliever Therapy in Patients $\geq 12$ Years Old

Step	Track 1	Track 2	Other Controller Options
1	<ul style="list-style-type: none"> <li>▪ As-needed low dose ICS/formoterol</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low dose ICS (whenever SABA is taken)</li> <li>▪ With as-needed ICS-SABA or as-needed SABA</li> </ul>	Low dose ICS (whenever SABA is taken), or daily LTRA, or add HDM SLIT
2	<ul style="list-style-type: none"> <li>▪ As-needed low dose ICS/formoterol</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low dose maintenance ICS</li> <li>▪ With as-needed ICS-SABA or as needed SABA</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low dose ICS (whenever SABA is taken) or daily LTRA or add HDM SLIT</li> </ul>
3	<ul style="list-style-type: none"> <li>▪ Low dose maintenance ICS/formoterol</li> <li>▪ With as-needed low dose ICS/formoterol</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low dose maintenance ICS/LABA</li> <li>▪ With as-needed ICS-SABA or as needed SABA</li> </ul>	<ul style="list-style-type: none"> <li>▪ Medium dose ICS or add LTRA or add HDM SLIT</li> </ul>
4	<ul style="list-style-type: none"> <li>▪ Medium dose maintenance ICS/formoterol</li> <li>▪ With as-needed low dose ICS/formoterol</li> </ul>	<ul style="list-style-type: none"> <li>▪ Medium/high dose maintenance ICS/LABA</li> <li>▪ With as-needed ICS-SABA or as needed SABA</li> </ul>	<ul style="list-style-type: none"> <li>▪ Add LAMA or add LTRA or march HDM SLIT or switch to high dose ICS</li> </ul>
5	<ul style="list-style-type: none"> <li>▪ Add on LAMA; refer for phenotypic assessment <math>\pm</math> anti-IgE (omalizumab), anti-IL-5/5R (mepolizumab, reslizumab, benralizumab), anti-IL4R (dupilumab), anti-TSLP (tezepelumab)</li> <li>▪ Consider high dose ICS/formoterol</li> <li>▪ With as-needed low dose ICS/formoterol</li> </ul>	<ul style="list-style-type: none"> <li>▪ Add on LAMA; refer for phenotypic assessment <math>\pm</math> anti-IgE (omalizumab), anti-IL-5/5R (mepolizumab, reslizumab, benralizumab), anti-IL4R (dupilumab)</li> <li>▪ Consider high dose ICS/LABA <math>\pm</math> anti-IgE (omalizumab), anti-IL-5/5R (mepolizumab, reslizumab, benralizumab), anti-IL4R (dupilumab), anti-TSLP (tezepelumab)</li> <li>▪ With as-needed ICS-SABA or as-needed SABA</li> </ul>	<ul style="list-style-type: none"> <li>▪ Add azithromycin (adults) or add LTRA or add low dose oral corticosteroid (considering adverse effects)</li> </ul>

# Bronchodilators, Beta Agonists

## 2024 GINA Guidelines – Controller and Reliever Therapy in Patients 6 to 11 Years Old

Step	Preferred Controller	Other Controller Options	Reliever
1	<ul style="list-style-type: none"><li>▪ Low dose ICS whenever SABA is taken</li></ul>	<ul style="list-style-type: none"><li>▪ --</li></ul>	<ul style="list-style-type: none"><li>▪ As needed SABA</li></ul>
2	<ul style="list-style-type: none"><li>▪ Daily low dose ICS</li></ul>	<ul style="list-style-type: none"><li>▪ Daily LTRA or low dose ICS whenever SABA is taken</li></ul>	<ul style="list-style-type: none"><li>▪ As needed SABA</li></ul>
3	<ul style="list-style-type: none"><li>▪ Low dose ICS/LABA, or medium dose ICS, or very low dose ICS/formoterol MART</li></ul>	<ul style="list-style-type: none"><li>▪ Low dose ICS + LTRA</li></ul>	<ul style="list-style-type: none"><li>▪ As needed SABA (or ICS/formoterol for MART)</li></ul>
4	<ul style="list-style-type: none"><li>▪ Medium dose ICS/LABA, or low dose ICS/formoterol MART; refer for expert advice</li></ul>	<ul style="list-style-type: none"><li>▪ Add tiotropium or LTRA</li></ul>	<ul style="list-style-type: none"><li>▪ As needed SABA (or ICS/formoterol for MART)</li></ul>
5	<ul style="list-style-type: none"><li>▪ Refer for phenotypic assessment ± higher dose ICS/LABA or add-on therapy (e.g., anti-IgE [omalizumab], anti-IL-4R [dupilumab], anti-IL5 [mepolizumab])</li></ul>	<ul style="list-style-type: none"><li>▪ As a last resort, add low dose oral corticosteroid (considering adverse effects)</li></ul>	<ul style="list-style-type: none"><li>▪ As needed SABA</li></ul>



# Gaucher Disease

# Gaucher Disease

Drug	Manufacturer	Indication(s)	Dosage	Availability
<b>Enzyme Replacement Therapy (ERT)</b>				
<b>imiglucerase (Cerezyme®)</b>	Genzyme	<p>Long-term enzyme replacement therapy for pediatric patients (<math>\geq</math> 2 years of age) and adults with confirmed type 1 Gaucher disease that results in <math>\geq</math> 1 of the following conditions:</p> <ul style="list-style-type: none"> <li>▪ anemia</li> <li>▪ thrombocytopenia</li> <li>▪ bone disease</li> <li>▪ hepatomegaly or splenomegaly</li> </ul>	<p>Individualized dosing by intravenous (IV) infusion; 2.5 units/kg of body weight 3 times/week up to 60 units/kg every 2 weeks</p> <p>Initial dosages range from 2.5 units/kg of body weight 3 times a week to 60 units/kg once every 2 weeks; most data available with 60 units/kg every 2 weeks</p>	<p>Lyophilized powder for injection (single-use):</p> <ul style="list-style-type: none"> <li>▪ 400 units/vial</li> </ul>
<b>taliglucerase alfa (Elelyso®)</b>	Pfizer	Long-term enzyme replacement therapy for adults and pediatric patients ( $\geq$ 4 years of age) with confirmed type 1 Gaucher disease	<p>Treatment-naïve adult and pediatric patients <math>\geq</math> 4 years of age: 60 units/kg every other week as a 60-to-120-minute IV infusion</p> <p>For patients switching from imiglucerase, start taliglucerase at the same unit/kg dose as the patient's previous imiglucerase dose</p> <p>Dosage adjustments can be made based on patient achieving as well as maintaining individual therapeutic goals</p>	<p>Lyophilized powder for injection (single-use):</p> <ul style="list-style-type: none"> <li>▪ 200 units/vial</li> </ul>

# Gaucher Disease



Drug	Manufacturer	Indication(s)	Dosage	Availability
<b>Enzyme Replacement Therapy (ERT) (continued)</b>				
velaglucerase alfa (Vpriv®)	Shire Human Genetic Therapies	Long-term enzyme replacement therapy for pediatric patients ( $\geq$ 4 years of age) and adults with type 1 Gaucher disease	<p>Individualized dosing by 60-minute IV infusion; 60 units/kg administered every 2 weeks; trials have evaluated doses from 15 units/kg to 60 units/kg every other week</p> <p>Patients being treated with stable imiglucerase dosages for Gaucher disease can switch to velaglucerase at previous imiglucerase dose 2 weeks after last imiglucerase dose</p>	<p>Lyophilized powder for injection (single-use):</p> <ul style="list-style-type: none"> <li>▪ 400 units/vial</li> </ul>
<b>Substrate Reduction Therapy</b>				
eliglustat (Cerdelga®)	Genzyme	Treatment of adult patients with type 1 Gaucher disease who are CYP2D6 extensive metabolizers, intermediate metabolizers, or poor metabolizers as detected by an FDA-approved test*	<p>Extensive or intermediate CYP2D6 metabolizers: 84 mg twice daily</p> <p>Poor CYP2D6 metabolizers: 84 mg once daily</p>	Capsule: 84 mg
miglustat (Yargesa, Zavesca®)	generic, Edenbridge, Actelion	Treatment of adult patients with mild to moderate type 1 Gaucher disease for whom enzyme replacement therapy is not a therapeutic option (e.g., due to constraints such as allergy, hypersensitivity, or poor venous access)	100 mg three times daily; reduce frequency to once or twice daily if adverse effects (diarrhea or tremor) become problematic	Capsule: 100 mg

# Gaucher Disease

- Gaucher disease (GD) is an autosomal recessive condition caused by deficiency of glucocerebrosidase
- This results in abnormal accumulation of glycolipids in cell lysosomes, which can lead to skeletal disease , anemia, hemorrhage, thrombocytopenia, splenomegaly, hepatomegaly, and growth retardation
- All IV enzyme replacement therapy (ERT) agents, imiglucerase (Cerezyme), velaglucerase alfa (Vpriv), and taliglucerase alfa (Elelyso), are forms of the enzyme glucocerebrosidase
- Oral substrate reduction therapy (SRT) agents, eliglustat (Cerdela) and miglustat (Zavesca), function as competitive and reversible inhibitors of the enzyme glucosylceramide synthase

# Gaucher Disease

- The International Collaborative Gaucher Group (ICGG) Gaucher Registry guidelines developed from a consensus of international experts recommend ERT for symptomatic pediatric patients and for those with severe disease
- Treatment should be individualized as response may vary
- Treatment is life-long, and therapy interruptions are not recommended
- Anaphylaxis has been reported in patients treated with taliglucerase
- The use of miglustat has been limited due to toxicity
- Data demonstrate that Cerezyme use is not associated with an increased risk of major birth defects, miscarriage, or other adverse maternal or fetal outcomes



# Hypoglycemics, Metformins

# Hypoglycemics, Metformins

## FDA-Approved Indications

Drug	Manufacturer	Indications
glipizide/ metformin (Metaglip™) <sup>1</sup>	generic	<ul style="list-style-type: none"><li>Initial therapy to improve glycemic control in adults with type 2 diabetes as an adjunct to diet and exercise</li><li>Second-line therapy in type 2 diabetics who have not achieved adequate glycemic control with a sulfonylurea or metformin alone</li></ul>
glyburide/ metformin (Glucovance®) <sup>2</sup>	generic	<ul style="list-style-type: none"><li>Initial therapy to improve glycemic control in adults with type 2 diabetes as an adjunct to diet and exercise</li><li>Second-line therapy in type 2 diabetics who have not achieved adequate glycemic control with a sulfonylurea or metformin alone</li><li>In combination with a TZD in patients who do not have adequate glycemic control with Glucovance alone</li></ul>
metformin (Glucophage®) <sup>3</sup>	generic	<ul style="list-style-type: none"><li>Improvement of glycemic control in adults with type 2 diabetes as an adjunct to diet and exercise in patients 10 years of age and older (including in combination with a sulfonylurea or insulin)</li></ul>
metformin ER (Fortamet™) <sup>4</sup>	Shionogi Pharma	<ul style="list-style-type: none"><li>Improvement of glycemic control in adults with type 2 diabetes as an adjunct to diet and exercise</li></ul>
metformin ER (Glumetza™) <sup>5</sup>	Depomed	<ul style="list-style-type: none"><li>Improvement of glycemic control in adults with type 2 diabetes as an adjunct to diet and exercise (including in combination with a sulfonylurea or insulin)</li></ul>
metformin XR (Glucophage XR®) <sup>6</sup>	generic	<ul style="list-style-type: none"><li>Improvement of glycemic control in adults with type 2 diabetes as an adjunct to diet and exercise (including in combination with a sulfonylurea or insulin)</li></ul>
metformin oral solution (Riomet™) <sup>7</sup>	Sun	<ul style="list-style-type: none"><li>Improvement of glycemic control in patients 10 years of age and older with type 2 diabetes as an adjunct to diet and exercise (including in combination with a sulfonylurea or insulin for ages 17 and older)</li></ul>
metformin ER oral suspension (Riomet ER™) <sup>8</sup>	Sun	<ul style="list-style-type: none"><li>Improvement of glycemic control in patients 10 years of age and older with type 2 diabetes as an adjunct to diet and exercise</li></ul>

# Hypoglycemics, Metformins

- It is estimated that over 38.4 million people in the US have diabetes
- Type 2 diabetes (T2DM) accounts for over 95% of all diagnosed cases of diabetes
- Per the ADA 2024 Standards of Medical Care in Diabetes, metformin, if not contraindicated and if tolerated, is a first-line option, in addition to lifestyle management, in the treatment of T2DM
- Per the ADA, metformin is recommended first-line for asymptomatic children with an HbA1c < 8.5%
- Those with marked hyperglycemia and a HbA1c  $\geq 8.5\%$  should be initiated on metformin and long-acting insulin
- The 2022 AACE updated guidelines recommend metformin as preferred initial therapy, in general

# Hypoglycemics, Metformins

- Per the 2022 Kidney Disease Improving Global Outcomes (KDIGO) guidelines on managing patients with diabetes and CKD, metformin is first-line treatment in most patients with estimated glomerular filtration rate (eGFR)  $\geq 30$  mL/min/1.73 m<sup>2</sup>
- According to the 2022 ADA and the European Association for the Study of Diabetes (EASD) position statement on the management of T2DM, metformin remains a first-line option for most patients for treatment of hyperglycemia
- Per the 2020 AACE and the ACE updated algorithm for the management of T2DM, metformin is the preferred treatment of choice for monotherapy and a first-line agent for dual and triple therapy

# Hypoglycemics, Metformins

- Metformin-containing products should not be used in patients with:
  - Renal disease or severe renal dysfunction (eGFR below 30 mL/minute/1.73 m<sup>2</sup>)
  - Acute or chronic metabolic acidosis including diabetic ketoacidosis
  - Conditions that can lead to renal dysfunction, including acute myocardial infarction and septicemia

# Hypoglycemics, Metformins

## *Clinical and Product Updates*

- ES and European Society of Endocrinology have published a clinical practice guideline for management of preexisting diabetes and pregnancy



# Hypoglycemics, SGLT2

# Hypoglycemics, SGLT2

Drug	Manufacturer	Indications
canagliflozin (Invokana®)	Janssen	<ul style="list-style-type: none"><li>Adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus (T2DM)</li><li>To reduce the risk of major adverse cardiovascular events (MACE) in adults with T2DM and established cardiovascular disease (CVD)</li><li>To reduce the risk of end-stage renal disease (ESRD), doubling of serum creatinine, cardiovascular (CV) death, and hospitalization for heart failure (HF) in adults with T2DM and diabetic nephropathy with albuminuria &gt; 300 mg/day</li></ul>
canagliflozin/ metformin (Invokamet®)	Janssen	<ul style="list-style-type: none"><li>Adjunct to diet and exercise to improve glycemic control in adults with T2DM</li><li>To reduce the risk of MACE in adults with T2DM and established CVD</li><li>Canagliflozin is indicated:<ul style="list-style-type: none"><li>To reduce the risk of MACE in adults with T2DM and established CVD</li><li>To reduce the risk of ESRD, doubling of serum creatinine, CV death, and hospitalization for HF in adults with T2DM and diabetic nephropathy with albuminuria</li></ul></li></ul>
canagliflozin/ metformin ER (Invokamet® XR)	Janssen	

# Hypoglycemics, SGLT2

Drug	Manufacturer	Indications
dapagliflozin (Farxiga®)	AstraZeneca; generic	<ul style="list-style-type: none"><li>▪ Adjunct to diet and exercise to improve glycemic control in adults with T2DM</li><li>▪ To reduce the risk of hospitalization for HF in adults with T2DM and established CVD or multiple CV risk factors</li><li>▪ To reduce the risk of CV death, hospitalization for HF, and urgent HF visit in adults with HF</li><li>▪ To reduce the risk of sustained estimated glomerular filtration rate (eGFR) decline, ESRD, CV death, and hospitalization for HF in adults with chronic kidney disease (CKD) at risk of progression</li></ul>
dapagliflozin/ metformin ER (Xigduo® XR)	AstraZeneca	<ul style="list-style-type: none"><li>▪ Adjunct to diet and exercise to improve glycemic control in adults with T2DM</li><li>▪ Dapagliflozin is indicated:<ul style="list-style-type: none"><li>– To reduce the risk of hospitalization for HF in adults with T2DM and established CVD or multiple CV risk factors</li><li>– To reduce the risk of CV death, hospitalization for HF in adults with heart failure with reduced ejection fraction (HFrEF), and urgent heart failure visits in patients with heart failure</li><li>– To reduce the risk of sustained eGFR decline, ESRD, CV death, and hospitalization for HF in adults with CKD at risk of progression</li></ul></li></ul>

# Hypoglycemics, SGLT2

Drug	Manufacturer	Indications
empagliflozin (Jardiance®)	Boehringer Ingelheim	<ul style="list-style-type: none"><li>▪ Adjunct to diet and exercise to improve glycemic control in adults and pediatric patients <math>\geq</math> 10 years of age with T2DM</li><li>▪ To reduce the risk of CV death in adults with T2DM and established CVD</li><li>▪ To reduce the risk of CV death plus hospitalizations for HF in adults with HFrEF</li></ul>
empagliflozin/metformin (Synjardy®)	Boehringer Ingelheim	<ul style="list-style-type: none"><li>▪ Adjunct to diet and exercise to improve glycemic control in adults and pediatric patients <math>\geq</math> 10 years of age with T2DM</li><li>▪ Empagliflozin is indicated:<ul style="list-style-type: none"><li>– To reduce the risk of CV death in adults with T2DM and established CVD</li><li>– To reduce the risk of CV death and hospitalization for HF in adults with HF</li></ul></li></ul>

# Hypoglycemics, SGLT2

Drug	Manufacturer	Indications
empagliflozin/ metformin ER (Synjardy® XR)	Boehringer Ingelheim	<ul style="list-style-type: none"><li>▪ Adjunct to diet and exercise to improve glycemic control in adults with T2DM</li><li>▪ Empagliflozin is indicated:<ul style="list-style-type: none"><li>– To reduce the risk of CV death in adults with T2DM and established CVD</li></ul></li><li>▪ To reduce the risk of CV death and hospitalization for HF in adults with HF</li></ul>
ertugliflozin (Steglatro®)	Merck, Sharp & Dohme	<ul style="list-style-type: none"><li>▪ Adjunct to diet and exercise to improve glycemic control in adults with T2DM</li></ul>
ertugliflozin/ metformin (Segluromet®)	Merck, Sharp & Dohme	<ul style="list-style-type: none"><li>▪ Adjunct to diet and exercise to improve glycemic control in adults with T2DM</li></ul>
sotagliflozin (Inpefa™)	Lexicon	<ul style="list-style-type: none"><li>▪ To reduce the risk of CV death, hospitalization for HF, and urgent HF visits in adults with HF or T2DM, CKD, and other CV risk factors</li></ul>

# Hypoglycemics, SGLT2

- SGLT2 inhibitors are effective in reducing HbA1c, postprandial glucose, and fasting plasma glucose, as well as reducing systolic blood pressure and weight
- The ADA prefers medications with proven CV and renal benefit in patients with CV and/or renal disease, respectively
- In patients with Atherosclerotic Cardiovascular Disease (ASCVD), a GLP-1RA or SGLT2 inhibitor with proven CVD benefit is preferred
- In patients with heart failure (HF) or chronic kidney disease (CKD), empagliflozin, canagliflozin, or dapagliflozin is preferred
- Sotagliflozin was not available at the time the guidelines were updated

# Hypoglycemics, SGLT2

- Per the ADA, GLP-1RAs and SGLT2 inhibitors are preferred when increased body weight is a concern, or tirzepatide (Mounjaro) can be considered
- The 2023 AACE guidelines include the use of SGLT2 inhibitors as an alternative to metformin for monotherapy and as an appropriate add-on to metformin in dual therapy and triple therapy
- They suggests that patients with ASCVD or who are at very high risk for ASCVD should be initiated on a GLP-1RA or SGLT2 inhibitor

# Hypoglycemics, SGLT2

- Patients with HF should be prescribed an SGLT2 inhibitor
- Patients with history of stroke or TIA should be initiated on a GLP-1RA or pioglitazone
- Patients with CKD should be prescribed an SGLT2 inhibitor or GLP-1RA
- For those who are overweight, obese, or at risk for hypoglycemia, a GLP-1RA, dual GLP-1/GIP receptor agonist, or SGLT2 inhibitor is preferred

# Hypoglycemics, SGLT2

- In 2022, the ADA and the EASD updated their 2018 position statement on the management of T2DM
- All patients with T2DM and CVD should be prescribed a GLP-1RA or SGLT2 inhibitor with proven benefit
- All patients with T2DM and CKD or HF should be prescribed a SGLT2 inhibitor with proven benefit
- When T2DM is not adequately controlled with lifestyle management and metformin, a SGLT2 inhibitor or GLP-1RA is recommended when weight loss is a priority
- A DPP-4 inhibitor, GLP-1RA, SGLT2 inhibitor, or TZD is recommended when there is a compelling need to minimize hypoglycemia

# Hypoglycemics, SGLT2

- The KDIGO 2022 guidelines on managing diabetes in CKD recommend first-line treatment with a SGLT2 inhibitor in most patients with an eGFR  $\geq 20$  mL/min/1.73 m<sup>2</sup> (until dialysis or transplant)
- The KDIGO 2025 updated recommendations for CKD in children & adults who are not receiving kidney replacement therapy recommend SGLT2 inhibitors for patients with CKD and eGFR  $>20$  mL/min/1.73 m<sup>2</sup> with or without diabetes
- In 2020, the American College of Cardiology (ACC) published an expert consensus decision pathway for CV risk reduction in patients with T2DM
- They identify opportunities to initiate a SGLT2 inhibitor or GLP-1RA with demonstrated CV or renal benefit in patients with T2DM

# Hypoglycemics, SGLT2

- A medication from either class may be initiated in any patient with T2DM and ASCVD at the time of diagnosis of T2DM or ASCVD any time after diagnosis
- An agent from either class can also be started in patients with T2DM without established ASCVD but who are at high risk of ASCVD
- In addition, initiation of a SGLT2 inhibitor with demonstrated CV or renal benefit is recommended in patients with HF and/or diabetic kidney disease
- A GLP-1RA is an alternative in patients with eGFR < 30 ml/min/1.73 m<sup>2</sup>

# Hypoglycemics, SGLT2

- In 2023, The American Heart Association (AHA)/ACC published guidelines for diagnosis and management for chronic coronary disease (CCD)
- They recommend SGLT2 inhibitors and GLP-1RAs in select patients with CCD, including groups without diabetes
- In September 2015, the FDA issued a safety communication regarding decreased BMD and increased risk of bone fracture associated with canagliflozin use

# Hypoglycemics, SGLT2

- In 2024, ACP published guidelines on newer pharmacologic treatments in adults with T2DM
- Key recommendations include:
  - Adding SGLT2 or GLP-1RA to metformin and lifestyle modifications in those with inadequate glycemic control
  - Using a SGLT-2 inhibitor to reduce the risk for all-cause mortality, Major Adverse Cardiovascular Event (MACE), progression of CKD, and hospitalization due to CHF
- They also state that sulfonylureas and long-acting insulins are inferior to SGLT-2 inhibitors and GLP-1 agonists in reducing all-cause mortality and morbidity



# Immune Globulins

# Immune Globulins

Drug	Manufacturer	Indications
Intravenous		
Alyglo®	GC Biopharma	<ul style="list-style-type: none"><li>Primary humoral immunodeficiency in adults</li></ul>
Asceniv™	ADMA Biologics	<ul style="list-style-type: none"><li>Primary humoral immunodeficiency in adults and adolescents 12 to 17 years of age</li></ul>
Bivigam®	ADMA Biologics	<ul style="list-style-type: none"><li>Primary humoral immunodeficiency in adults and pediatric patients 2 years of age and older</li></ul>
Flebogamma® DIF 5% and 10%	Grifols	<ul style="list-style-type: none"><li>Primary (inherited) immunodeficiency in patients 2 years of age and older</li><li>Chronic primary immune thrombocytopenia (10% only) in patients 2 years of age and older</li></ul>

# Immune Globulins

Drug	Manufacturer	Indications
Intravenous		
Gammaplex® 5% and 10%	Bio Products Laboratory	<ul style="list-style-type: none"><li>Primary humoral immunodeficiency in patients 2 years of age and older</li><li>Chronic immune thrombocytopenic purpura</li></ul>
Octagam® 5% and 10%	Octapharma	<ul style="list-style-type: none"><li>Primary humoral immunodeficiency (5% only)</li><li>Chronic immune thrombocytopenic purpura in adults (10% only)</li><li>Dermatomyositis (10% only)</li></ul>
Panzyga®	Octapharma/ Pfizer	<ul style="list-style-type: none"><li>Primary humoral immunodeficiency in patients 2 years of age and older</li><li>Chronic immune thrombocytopenia in adults</li><li>Chronic inflammatory demyelinating polyneuropathy in adults</li></ul>
Privigen®	CSL Behring	<ul style="list-style-type: none"><li>Primary humoral immunodeficiency</li><li>Chronic immune thrombocytopenic purpura in patients age 15 years and older</li><li>Chronic inflammatory demyelinating polyneuropathy in adults (Limitation of use: maintenance therapy has not been studied &gt; 6 months)</li></ul>
Yimmugo®	Bioteest AG	Primary humoral immunodeficiency in patients 2 years of age and older

# Immune Globulins

Drug	Manufacturer	Indications
Intravenous or Subcutaneous		
Gammagard® Liquid	Baxalta	<ul style="list-style-type: none"><li>Primary humoral immunodeficiency in patients 2 years of age and older</li><li>Multifocal motor neuropathy</li><li>Chronic inflammatory demyelinating polyneuropathy in adults</li></ul>
Gammagard® Liquid ERC	Baxalta	<ul style="list-style-type: none"><li>Primary humoral immunodeficiency in patients 2 years of age and older</li></ul>
Gammaked™	Kedrion Biopharma*	<ul style="list-style-type: none"><li>Primary humoral immunodeficiency in patients 2 years of age and older</li><li>Idiopathic thrombocytopenic purpura (IV use only)</li><li>Chronic inflammatory demyelinating polyneuropathy (IV use only)</li></ul>
Gamunex®-C	Grifols	<ul style="list-style-type: none"><li>Primary humoral immunodeficiency in patients 2 years of age and older</li><li>Idiopathic thrombocytopenic purpura (IV use only)</li><li>Chronic inflammatory demyelinating polyneuropathy (IV use only) in adults</li></ul>

# Immune Globulins

Drug	Manufacturer	Indications
Subcutaneous		
Cutaquig®	Octapharma/ Pfizer	<ul style="list-style-type: none"><li>▪ Primary humoral immunodeficiency in patients 2 years of age and older</li></ul>
Cuvitru®	Shire/Takeda	<ul style="list-style-type: none"><li>▪ Primary humoral immunodeficiency in patients 2 years of age and older</li></ul>
Hizentra®	CSL Behring	<ul style="list-style-type: none"><li>▪ Primary immune deficiency in patients 2 years of age and older</li><li>▪ Maintenance therapy in adults with chronic inflammatory demyelinating polyneuropathy</li></ul>
immune globulin 10%/recombinant human hyaluronidase (HyQvia®)	Baxalta	<ul style="list-style-type: none"><li>▪ Primary immunodeficiency in adults and pediatric patients two years of age and older</li><li>▪ Maintenance therapy for chronic inflammatory demyelinating polyneuropathy in adults</li></ul>
Xembify®	Grifols	<ul style="list-style-type: none"><li>▪ Primary humoral immunodeficiency in patients 2 years of age and older</li></ul>

# Immune Globulins

The following table outlines the various phenotypic categorizations of PIDD as offered by the American Academy of Allergy, Asthma, and Immunology (AAAAI)

		IgG			
		Quantity/Quality			
		Absent/Absent	Low/Low	Normal/Low	Low/Normal
B cell	Absent	<b>Category I</b> <ul style="list-style-type: none"><li>▪ Agamma-globulinemia</li><li>▪ SCID</li></ul>			
	Present		<b>Category II</b> <ul style="list-style-type: none"><li>▪ Hyper IgM</li><li>▪ CVID</li><li>▪ NEMO deficiency</li></ul>	<b>Category III</b> <ul style="list-style-type: none"><li>▪ Specific Ab Deficiency</li><li>▪ NEMO deficiency</li><li>▪ Subclass deficiency with specific antibody defect</li></ul>	<b>Category IV</b> <ul style="list-style-type: none"><li>▪ Transient hypogamma-globulinemia of infancy</li><li>▪ Primary hypogamma-globulinemia</li></ul>

# Immune Globulins

- Exogenous immune globulin has been FDA approved for use in multifocal motor neuropathy (MMN), chronic inflammatory demyelinating polyneuropathy (CIDP), idiopathic thrombocytopenic purpura (ITP), Kawasaki disease, and B-cell chronic lymphocytic leukemia
- Therapeutic immune globulin is prepared from pooled plasma obtained from healthy donors at plasma donation centers in the US
- These products are purified to contain 95% to 99% IgG with trace amounts of IgA and IgM
- Each product has validated their production methods to ensure low risk of transmission of viruses

# Immune Globulins

- Preparation for each product differs in purification, including production methods related to fractionation, exchange chromatography, and filtration
- The AAAAI and the Clinical Immunology Society both recommend product selection to be relied heavily on patient-specific characteristics
- The subcutaneous (SC) route is as efficacious as the intravenous (IV) route for the treatment of primary immunodeficiencies
- All of the products in the class have similar efficacy and safety profiles
- Due to limited supply, the use of immune globulin products should be reserved for approved indications or conditions where the benefit has been clearly established and is consistent with clinical guidelines

# Immune Globulins

## *Clinical and Product Update*

- FDA has approved a sBLA for Gammagard Liquid ERC for the indication of replacement therapy for primary humoral immunodeficiency in adults and pediatric patients  $\geq 2$  yo
- Qivigy (immune globulin intravenous, human-kthm) is approved for the treatment of adults with primary humoral immunodeficiency
- FDA Adverse Event Reporting System (FAERS) has received increased reporting of allergic/hypersensitivity type reactions following infusion of specific lots of Asceniv and Bivigam
- Reports included serious adverse events, some of which were considered severe



# NSAIDs

# NSAIDs (Single Oral Agents)

Drug	Mfg	OA	RA	JIA	AS	Pain	PD	Other
celecoxib (Celebrex®)0F0	generic, Pfizer/Viatri s	X	X	X	X	X	X	
diclofenac potassium (Lofena)	generic, Carwin	X	X			X	X	
diclofenac potassium (Zipsor®)2F2	generic, Assertio					X		
diclofenac sodium3	generic	X	X		X (IR)			
diclofenac submicronized (Zorvolex®)5F	generic**, Egalet/Zyla	X				X		
diflunisal (Dolobid)6F6F	generic, Ina	X	X			X		
etodolac	generic	X	X			X		

# NSAIDs (Single Oral Agents)

Drug	Mfg	OA	RA	JIA	AS	Pain	PD	Other
etodolac ER	generic	X	X	X				
fenoprofen (Nalfon®)	generic, Xspire	X	X			X		
flurbiprofen	Teva	X	X					
ibuprofen	generic	X	X			X	X	
indomethacin (Indocin®)	generic, Egalet/Zyla	X	X		X			Treatment of painful shoulder (tendonitis, bursitis) and acute gout
ketoprofen IR (Kiprofen)	generic, Trifluent	X	X			X	X	
ketoprofen ER1	Mylan	X	X					

# NSAIDs (Single Oral Agents)

Drug	Mfg	OA	RA	JIA	AS	Pain	PD	Other
ketorolac tromethamine <sup>1</sup>	generic					X		Short-term ( $\leq$ 5 days) management of moderately severe acute pain that requires analgesia at the opioid level, usually in a postoperative setting. Therapy should always be initiated with ketorolac tromethamine injectable formulation (IM/IV) and ketorolac tromethamine tablets are to be used only as continuation treatment, if necessary
meclofenamate <sup>1</sup>	generic	X	X	X	X	X	X	Treatment of primary dysmenorrhea/excessive blood loss Treatment of acute painful shoulder and acute gouty arthritis
mefenamic acid <sup>17</sup>	generic					X < 1 week	X	
meloxicam	generic	X	X	X				
meloxicam submicronized (Vivlodex <sup>TM</sup> ) <sup>2</sup>	generic, Egalet/Zyla	X						

# NSAIDs (Single Oral Agents)

Drug	Mfg	OA	RA	JIA	AS	Pain	PD	Other
nabumetone* (Relafen DS™)	generic, Carwin	X	X					
naproxen (Anaprox® DS, Naprelan CR®, EC- / Naprosyn®)	generic, Canton, Almatica, Athena, Woodward	X	X	X	X	X	X	Treatment of tendonitis, bursitis, and acute gout
oxaprozin (Coxanto™, Daypro®)	generic, Solubiomix, Pharmacia/ Pfizer	X	X	X				
piroxicam (Feldene®)	generic, Pfizer	X	X					
sulindac <sup>2</sup>	generic	X	X		X			Treatment of acute painful shoulder and acute gouty arthritis
tolmetin (Tolectin)	generic, Poly	X	X	X				

# NSAIDs

Drug	Mfg	OA	RA	JIA	AS	Pain	PD	Other
<b>Oral Combination Agents</b>								
diclofenac sodium/misoprostol (Arthrotec®)	generic, Pfizer	X	X					Indicated for patients who are at high risk for NSAID-induced GI ulcers
ibuprofen/famotidine1	generic	X	X					Indicated for the relief of signs and symptoms of rheumatoid arthritis and osteoarthritis and to decrease the risk of developing upper gastrointestinal ulcers
naproxen/esomeprazole (Vimovo®)	generic, Horizon	X	X		X			Indicated for the relief of signs and symptoms of osteoarthritis, rheumatoid arthritis, and ankylosing spondylitis and to reduce the risk of naproxen-induced gastric ulcers  Indicated for the relief of signs and symptoms of juvenile idiopathic arthritis (JIA) and to reduce the risk of naproxen-induced gastric ulcers in adolescents $\geq$ 12 years of age weighing $\geq$ 38 kg

# NSAIDs

Drug	Mfg	OA	RA	JIA	AS	Pain	PD	Other
<b>Topical Agents</b>								
diclofenac epolamine (Flector®; Licart™)	generic*, IBSA					X		Topical treatment of acute pain due to minor strains, sprains, and contusions in patients $\geq$ 6 years old (Licart labeled for adult use only)
diclofenac sodium solution (Pennsaid®)F	generic, Horizon	X						Treatment of signs and symptoms of osteoarthritis of the knee(s)
diclofenac sodium gel (Voltaren® Arthritis Pain Gel†)F	generic, GSK	X						Relief of pain of osteoarthritis of joints amenable to topical treatment, such as of the knees and hands
<b>Nasal Agents</b>								
ketorolac tromethamine (Sprix®)	Egalet/Zyl a					X		Short-term (up to 5 days) management of moderate to moderately severe pain that requires analgesia at the opioid level

# NSAIDs

- NSAIDs are commonly used to treat rheumatoid arthritis (RA), osteoarthritis (OA), and pain from various etiologies
- In the US, approximately 70 million prescriptions are filled yearly for NSAIDs
- When OTC utilization is included, over 30 billion doses of NSAIDs are taken each year
- NSAIDs reduce swelling and ease inflammation that can cause pain
- In 2022, the American Academy of Orthopaedic Surgeons (AAOS) stated NSAIDs are appropriate for use in all knee OA populations regardless of age or level of functioning
- The 2023 AAOS clinical practice guidelines also note strong evidence to support NSAIDs to improve short-term pain, function, or both in patients with symptomatic OA of the hip

# NSAIDs

- A 2021 American College of Rheumatology (ACR) guideline conditionally recommends a brief trial of scheduled NSAIDs for active oligoarthritis and temporomandibular joint (TMJ) arthritis
- For systemic Juvenile Idiopathic Arthritis (JIA) without macrophage activation syndrome, NSAIDs are conditionally recommended as initial monotherapy
- The 2020 ACR guideline on the management of gout strongly recommends oral colchicine, NSAIDs, or glucocorticoids as first-line treatment for gout flares over other agents
- The 2019 ACR strongly recommends oral NSAIDs for hand, knee, and hip OA
- They also strongly recommended topical NSAIDs for knee OA and conditionally recommended them for hand OA

# NSAIDs

- The ACP and the American Academy of Family Physicians (AAFP) published a clinical practice guideline in 2020 on the management of acute pain in an outpatient setting associated from non-low back and musculoskeletal injuries in adults
- They recommend treatment with topical NSAIDs, with or without menthol gel, as first-line therapy to decrease or relieve symptoms, to improve physical functioning, and for patient treatment satisfaction
- They suggest oral NSAIDs to reduce/relieve symptoms and to improve physical function, and may be combined with oral acetaminophen to reduce pain

# NSAIDs

- The American Headache Society (AHS) recommends the use of NSAIDs and/or other non-opioid analgesics for the acute treatment of mild to moderate migraine
- AHS designates celecoxib oral solution, diclofenac, ibuprofen, and naproxen as options with established efficacy
- Oral ketoprofen and flurbiprofen are determined to be “probably effective” for acute migraine treatment
- ACOG considers NSAIDs first-line treatment for primary dysmenorrhea (PD) in adolescents
- If one NSAID does not provide adequate pain relief, an alternate should be tried

# NSAIDs

- NSAIDs are associated with adverse effects including gastrointestinal (GI) bleeding, peptic ulcer disease, hypertension, edema, and renal disease
- NSAIDs have also been linked to an increased risk of myocardial infarction (MI) which is reflected in the boxed warning for all NSAIDs
- GI adverse effects induced by NSAIDs lead to significant morbidity and mortality
- Data are available that support use of any proton pump inhibitor with concurrent NSAID administration
- Products designed to mitigate NSAID GI adverse reactions (Arthrotec and Vimovo) are available

# NSAIDs

- Celecoxib (Celebrex), which selectively inhibits the cyclooxygenase-2 (COX-2) enzyme, has equal efficacy to many of the other NSAIDs, but the issue of a better safety profile is unclear
- The available clinical data do not suggest that any one NSAID offers a clear advantage compared to the others in terms of safety or efficacy
- Ketorolac nasal spray (Sprix) offers an alternative method of drug delivery resulting in a quick onset of action
- For patients at risk for GI or CV events, topical administration of diclofenac (e.g., Flector/Licart, Pennsaid, Voltaren Arthritis Pain gel, and diclofenac-containing kits) provides significantly less adverse reactions compared to the oral route



# Oncology, Oral - Hematologic

# Oncology, Oral - Hematologic

Drug	Manufacturer	FDA-Approved Indications
acalabrutinib (Calquence®)	AstraZeneca	<ul style="list-style-type: none"> <li>Treatment of adults with mantle cell lymphoma (MCL) treated with <math>\geq 1</math> prior therapy*</li> <li>Treatment of adults with chronic lymphocytic leukemia (CLL) or small lymphocytic lymphoma (SLL)</li> </ul>
asciminib (Scemblix®)	Novartis	<ul style="list-style-type: none"> <li>Treatment of adult patients with chronic phase (CP) Philadelphia chromosome-positive (Ph+) chronic myeloid leukemia (CML) previously treated with <math>\geq 2</math> tyrosine kinase inhibitors*</li> <li>Treatment of adult patients with Ph+ CML in CP with the T315I mutation</li> </ul>
azacitidine (Onureg®)	Celgene/BMS	<ul style="list-style-type: none"> <li>Continued treatment of adult patients with acute myeloid leukemia who achieved first complete remission (CR) or complete remission with incomplete blood count recovery (CRi) following intensive induction chemotherapy and are not able to complete intensive curative therapy</li> </ul>
bosutinib (Bosulif®)	Pfizer	<ul style="list-style-type: none"> <li>Treatment of adults newly-diagnosed chronic phase (CP) Ph+ chronic myeloid leukemia (CML)</li> <li>Treatment of chronic, accelerated, or blast phase Ph+ CML with resistance or intolerance to prior therapy</li> </ul>
busulfan (Myleran®)	Aspen/Prasco LA	<ul style="list-style-type: none"> <li>Palliative treatment of chronic myelogenous (myeloid, myelocytic, granulocytic) leukemia†</li> </ul>

# Oncology, Oral - Hematologic



Drug	Manufacturer	FDA-Approved Indications
chlorambucil (Leukeran®)	Aspen/Prasco LA	<ul style="list-style-type: none"> <li>Treatment of chronic lymphatic (lymphocytic) leukemia, malignant lymphomas, including lymphosarcoma, giant follicular lymphoma, and Hodgkin's disease; chlorambucil is not curative in any of these disorders but may produce clinically useful palliation</li> </ul>
dasatinib (Sprycel®)	Bristol-Meyers Squibb	<ul style="list-style-type: none"> <li>Treatment of adults with chronic, accelerated, or myeloid or lymphoid blast phase Ph+ CML with resistance or intolerance to prior therapy including imatinib (Gleevec)</li> <li>Treatment of adults with Ph+ acute lymphoblastic leukemia (ALL) with resistance or intolerance to prior therapy</li> <li>Newly diagnosed adult patients with Ph+ CML in chronic phase</li> <li>Treatment of pediatric patients with Ph+ CML in chronic phase</li> <li>Treatment of pediatric patients with newly diagnosed Ph+ ALL in combination with chemotherapy</li> </ul>
decitabine/cedazuridine (Inqovi®)	Taiho Oncology	<ul style="list-style-type: none"> <li>Treatment of adults with myelodysplastic syndromes (MDS), including previously treated and untreated, de novo and secondary MDS with the following French-American-British subtypes (refractory anemia, refractory anemia with ringed sideroblasts, refractory anemia with excess blasts, and chronic myelomonocytic leukemia [CMML]) and intermediate-1, intermediate-2, and high-risk International Prognostic Scoring System group</li> </ul>
duvelisib (Copiktra®)	Verastem	<ul style="list-style-type: none"> <li>Relapsed or refractory chronic lymphocytic leukemia (CLL) or small lymphocytic lymphoma (SLL) after <math>\geq 2</math> prior therapies</li> </ul>
enasidenib (Idhifa®)	Celgene/BMS	<ul style="list-style-type: none"> <li>Relapsed or refractory acute myeloid leukemia (AML) with an isocitrate dehydrogenase-2 (IDH2) mutation, as determined with an FDA-approved test<sup>§</sup></li> </ul>

# Oncology, Oral - Hematologic

Drug	Manufacturer	FDA-Approved Indications
fedratinib (Inrebic®)	Celgene/BMS	<ul style="list-style-type: none"> <li>Intermediate-2 or high-risk primary or secondary post-polycythemia vera or post-essential thrombocythemia myelofibrosis (MF)</li> </ul>
gilteritinib (Xospata®)	Astellas	<ul style="list-style-type: none"> <li>Relapsed or refractory adults with AML with a FLT3 mutation, as detected by an FDA-approved test<sup>§</sup></li> </ul>
glasdegib (Daurismo™)	Pfizer	<ul style="list-style-type: none"> <li>In combination with low-dose cytarabine, for the treatment of newly diagnosed AML in adult patients who are <math>\geq</math> 75 years old or who have comorbidities that preclude use of intensive induction chemotherapy</li> </ul>
hydroxyurea (Hydrea®)	generic, Bristol-Myers Squibb	<ul style="list-style-type: none"> <li>Resistant CML</li> <li>Locally advanced squamous cell carcinomas of the head and neck (excluding lip), in combination with concurrent chemoradiation<sup>¶</sup></li> </ul>
ibrutinib (Imbruvica®)	Pharmacyclics	<ul style="list-style-type: none"> <li>Mantle cell lymphoma (MCL) in patients who have received <math>\geq</math> 1 prior therapy*</li> <li>CLL/ SLL</li> <li>CLL/ SLL with 17p deletion</li> <li>Waldenström's macroglobulinemia</li> <li>Marginal zone lymphoma (MZL) requiring systemic therapy and patient has had prior anti-CD20-based therapy*</li> <li>Chronic graft versus host disease (cGVHD) after failure of <math>\geq</math> 1 line of systemic therapy in adults and pediatric patients <math>\geq</math> 1 year of age</li> </ul>
idelalisib (Zydelig®)	Gilead	<ul style="list-style-type: none"> <li>Relapsed CLL, in combination with rituximab, in patients for whom rituximab alone would be considered appropriate therapy due to other comorbidities <sup>  , **</sup></li> </ul>

# Oncology, Oral - Hematologic

Drug	Manufacturer	FDA-Approved Indications
imatinib (Gleevec®)	generic, Novartis	<ul style="list-style-type: none"><li>▪ Newly diagnosed adult and pediatric patients with Ph+ CML in chronic phase</li><li>▪ Patients with Ph+ CML in blast crisis, accelerated phase, or chronic phase after failure of interferon-alpha therapy</li><li>▪ Adult patients with relapsed or refractory Ph+ ALL</li><li>▪ Pediatric patients with newly diagnosed Ph+ ALL in combination with chemotherapy</li><li>▪ Adult patients with myelodysplastic/myeloproliferative diseases associated with platelet-derived growth factor receptor (PDGFR) gene re-arrangements</li><li>▪ Adult patients with aggressive systemic mastocytosis without the D816V c-Kit mutation or with c-Kit mutational status unknown</li><li>▪ Adult patients with hypereosinophilic syndrome and/or chronic eosinophilic leukemia who have the FIP1L1-PDGFR<math>\alpha</math> fusion kinase (mutational analysis or FISH demonstration of CHIC2 allele deletion) and for patients with hypereosinophilic syndrome and/or chronic eosinophilic leukemia who are FIP1L1-PDGFR<math>\alpha</math> fusion kinase-negative or unknown</li><li>▪ Adult patients with unresectable, recurrent, and/or metastatic dermatofibrosarcoma protuberans (DFSP)</li><li>▪ Patients with Kit (CD117)-positive unresectable and/or metastatic malignant gastrointestinal stromal tumors (GIST)</li><li>▪ Adjuvant treatment of adult patients following resection of Kit (CD117)-positive GIST</li></ul>

# Oncology, Oral - Hematologic



Drug	Manufacturer	FDA-Approved Indications
ivosidenib (Tibsovo®)	Agios/Servier	<ul style="list-style-type: none"> <li>Adult patients with relapsed or refractory AML with a susceptible isocitrate dehydrogenase-1 (IDH1) mutation, as detected by an FDA-approved test<sup>†</sup></li> <li>In combination with azacitidine or as monotherapy in adult patients with newly diagnosed AML who are <math>\geq</math> 75 years old or who have comorbidities that preclude the use of intensive induction chemotherapy with a susceptible IDH1 mutation, as detected by an FDA-approved test<sup>†</sup></li> <li>Adult patients with previously treated locally advanced or metastatic cholangiocarcinoma with an IDH1 mutation as detected by an FDA-approved test<sup>†,††</sup></li> </ul>
ixazomib (Ninlaro®)	Millenium	<ul style="list-style-type: none"> <li>In combination with lenalidomide and dexamethasone for the treatment of multiple myeloma in patients who have received <math>\geq</math> 1 prior therapy<sup>§</sup></li> </ul>
lenalidomide (Revlimid®)	generic, Celgene/BMS	<ul style="list-style-type: none"> <li>In combination with dexamethasone for the treatment of multiple myeloma</li> <li>As maintenance therapy for multiple myeloma following autologous hematopoietic stem cell transplantation (auto-HSCT)</li> <li>Treatment of transfusion-dependent anemia due to low-or intermediate-1-risk myelodysplastic syndromes associated with a deletion of 5q cytogenetic abnormality with or without additional cytogenetic abnormalities</li> <li>Treatment of mantle cell lymphoma after relapse or disease progression after 2 prior therapies, 1 of which included bortezomib</li> <li>In combination with a rituximab product for the treatment of previously treated FL</li> <li>In combination with a rituximab product for the treatment of previously treated MZL</li> </ul>
melphalan (Alkeran®)	Alvogen, Apopharma	<ul style="list-style-type: none"> <li>Palliative treatment of multiple myeloma</li> <li>Palliation of non-resectable epithelial carcinoma of the ovary</li> </ul>

# Oncology, Oral - Hematologic



Drug	Manufacturer	FDA-Approved Indications
mercaptopurine (Purixan®)	generic (tablets); Nova (suspension)	<ul style="list-style-type: none"> <li>ALL as a component of a combination maintenance therapy regimen</li> </ul>
midostaurin (Rydapt®)	Novartis	<ul style="list-style-type: none"> <li>Newly diagnosed AML that is FLT3 mutation-positive as detected by an FDA-approved test§, in combination with standard cytarabine and daunorubicin induction and cytarabine consolidation†‡</li> <li>Aggressive systemic mastocytosis (ASM), systemic mastocytosis with associated hematological neoplasm (SM-AHN), or mast cell leukemia</li> </ul>
nilotinib (Tasigna®)	Novartis	<ul style="list-style-type: none"> <li>Accelerated phase and chronic phase Ph+ CML in adult patients resistant to or intolerant to prior therapy that included imatinib (Gleevec)</li> <li>Newly diagnosed adult and pediatric patients <math>\geq 1</math> year of age with Ph+ CML in chronic phase</li> <li>Treatment of chronic phase and accelerated phase Ph+ CML with resistance or intolerance to prior tyrosine kinase inhibitor (TKI) therapy in pediatric patients <math>\geq 1</math> year of age</li> </ul>
pacritinib (Vonjo™)	CTI BioPharma	<ul style="list-style-type: none"> <li>Treatment of adults with intermediate or high-risk primary or secondary (post-polycythemia vera or post-essential thrombocythemia) myelofibrosis with a platelet count below <math>50 \times 10^9/L^*</math></li> </ul>
pomalidomide (Pomalyst®)	Celgene/BMS	<ul style="list-style-type: none"> <li>For use in combination with dexamethasone for patients with multiple myeloma who have received <math>\geq 2</math> prior therapies including lenalidomide and a proteasome inhibitor and have demonstrated disease progression on or within 60 days of completion of the last therapy</li> <li>For the treatment of adults with acquired immunodeficiency syndrome (AIDS)-related Kaposi sarcoma (KS) after failure of highly active antiretroviral therapy (HAART), as well as for the treatment of KS in adults who are human immunodeficiency virus (HIV)-negative*</li> </ul>

# Oncology, Oral - Hematologic



Drug	Manufacturer	FDA-Approved Indications
ponatinib (Iclusig®)	Millennium	<ul style="list-style-type: none"> <li>Treatment of adult patients with chronic phase (CP) CML with resistance or intolerance to <math>\geq 2</math> prior kinase inhibitors</li> <li>Treatment of adult patients with T315I-positive CML (chronic phase, accelerated phase, or blast phase) or T315I-positive Ph+ ALL</li> <li>Treatment of adult patients with accelerated phase (AP) or blast phase (BP) CML or Ph+ ALL for whom no other kinase inhibitors are indicated §§</li> </ul>
procarbazine (Matulane®)	Leadiant	<ul style="list-style-type: none"> <li>For use in combination with other anticancer drugs for the treatment of stage 3 and stage 4 Hodgkin's disease; used as part of the MOPP regimen (nitrogen mustard, vinorelbine, procarbazine, prednisone)</li> </ul>
ruxolitinib (Jakafi®)	Incyte	<ul style="list-style-type: none"> <li>Treatment of intermediate or high-risk MF, including primary MF, post-polycythemia vera MF and post-essential thrombocythemia MF in adults</li> <li>Treatment of polycythemia vera in adults who have had an inadequate response to or are intolerant of hydroxyurea</li> <li>Treatment of steroid-refractory acute graft versus host disease (GVHD) in adult and pediatric patients <math>\geq 12</math> years of age</li> <li>Treatment of chronic GVHD (cGVHD) in adults and children <math>\geq 12</math> years old after failure of 1 or 2 lines of systemic therapy</li> </ul>
selinexor (Xpovio®)	Karyopharm	<ul style="list-style-type: none"> <li>In combination with bortezomib and dexamethasone for the treatment of adults with multiple myeloma who have received <math>\geq 1</math> prior therapy</li> <li>In combination with dexamethasone for the treatment of relapsed or refractory multiple myeloma (RRMM) who have received <math>\geq 4</math> prior therapies and whose disease is refractory to <math>\geq 2</math> proteasome inhibitors, <math>\geq 2</math> immunomodulatory agents, and an anti-CD38 monoclonal antibody</li> <li>Treatment of adults with relapsed or refractory diffuse large B-cell lymphoma (DLBCL), not otherwise specified, including DLBCL arising from follicular lymphoma, after <math>\geq 2</math> lines of systemic therapy*</li> </ul>

# Oncology, Oral - Hematologic



Drug	Manufacturer	FDA-Approved Indications
thalidomide (Thalomid®)	Celgene/BMS	<ul style="list-style-type: none"> <li>Treatment of newly diagnosed multiple myeloma in combination with dexamethasone</li> <li>Acute treatment of cutaneous manifestations of moderate to severe erythema nodosum leprosum (ENL)***</li> <li>Prevention and suppression of cutaneous manifestations of ENL recurrence as maintenance therapy</li> </ul>
thioguanine (Tabloid®)	Aspen/Prasco LA	<ul style="list-style-type: none"> <li>For remission induction and remission consolidation of acute nonlymphocytic leukemias†††</li> </ul>
tretinoin	generic	<ul style="list-style-type: none"> <li>For remission induction in patients with acute promyelocytic leukemia (APL), FAB classification M3 characterized by the presence of the t(15;17) translocation and/or presence of the PML/RAR<math>\alpha</math> gene who are refractory to, have relapsed from, or have a contraindication to anthracycline chemotherapy##</li> </ul>
venetoclax (Venclexta®)	AbbVie	<ul style="list-style-type: none"> <li>Treatment of CLL or SLL in adult patients</li> <li>In combination with azacitidine, decitabine, or low-dose cytarabine for the treatment of newly diagnosed AML in adults who are age 75 years or older or who have comorbidities that preclude use of intensive induction chemotherapy</li> </ul>
vorinostat (Zolinza®)	Merck, Sharp & Dohme	<ul style="list-style-type: none"> <li>Treatment of cutaneous manifestations of cutaneous T-cell lymphoma (CTCL) in patients who have progressive, persistent, or recurrent disease on or following 2 systemic therapies</li> </ul>
zanubrutinib (Brukinsa®)	Beigene	<ul style="list-style-type: none"> <li>Treatment of adult patients with mantle cell lymphoma (MCL) who have received <math>\geq 1</math> prior therapy*</li> <li>Treatment of adult patients with Waldenstrom's macroglobulinemia (WM)</li> <li>Treatment of adult patients with relapsed or refractory marginal zone lymphoma (MZL) who have received <math>\geq 1</math> anti-CD20-based regimen*</li> </ul>

# Oncology, Oral - Hematologic

## *Clinical and Product Updates*

- Revuforj (revumenib) was approved by the FDA for treatment of R/R acute leukemia with a lysine methyltransferase 2A gene (KMT2A) translocation in adults and pediatric patients  $\geq 1$  yo
- It has also been approved for treatment of R/R acute myeloid leukemia (AML) with a susceptible nucleophosmin 1 (NPM1) mutation in adults and pediatric patients  $\geq 1$  year of age who have no satisfactory alternative treatment options

# Oncology, Oral - Hematologic

## *Clinical and Product Updates*

- The FDA has granted Accelerated Approval to dordaviprone (Modeyso) for adult and pediatric patients  $\geq 1$  yo with diffuse midline glioma harboring an H3 K27M mutation with progressive disease following prior therapy
- Komzifti (ziftomenib) is approved for the treatment of adults with R/R AML with a susceptible NPM1 mutation who have no satisfactory alternative treatment options



# Ophthalmics, Anti-inflammatory/ Immunomodulators

# Ophthalmics, Anti-Inflammatory/Immunomodulators

Drug	Manufacturer	Indication
cyclosporine emulsion (Restasis®, Restasis Multidose™)	Allergan; generic (Restasis only)	Increase tear production in patients whose tear production is presumed to be suppressed due to ocular inflammation associated with keratoconjunctivitis sicca
cyclosporine emulsion (Verkazia®)	Eyevance/Harrow	Treatment of vernal keratoconjunctivitis (VKC) in adults and children $\geq$ 4 years of age
cyclosporine solution (Cequa®)	Sun	Increase tear production in patients with keratoconjunctivitis sicca (dry eye)
cyclosporine solution (Vevye®)	Harrow	Treatment of signs and symptoms of dry eye disease (DED)
lifitegrast (Xiidra®)	Novartis/ Bausch & Lomb	Treatment of signs and symptoms of DED in adults
loteprednol (Eysuvis®)	Kala/Alcon	Short-term (up to 14 days) treatment of DED signs and symptoms
perfluorohexyloctane solution (Miebo™)	Bausch & Lomb	Treatment of signs and symptoms of DED
varenicline nasal spray (Tyrvaya®)	Oyster Point	Treatment of the signs and symptoms of DED in adults

# Ophthalmics, Anti-Inflammatory/Immunomodulators

- Dry eye disease (DES)/ Keratoconjunctivitis sicca (KCS) affects approximately 5% to 50% of the US population
- It occurs more commonly in patients over 50 years of age and in postmenopausal women
- According to the 2023 Preferred Practice Parameter on dry eye syndrome and the 2024 Cornea/External Disease Summary Benchmark from the American Academy of Ophthalmology (AAO), artificial tear substitutes are recommended for mild DES

# Ophthalmics, Anti-Inflammatory/Immunomodulators

- Recommended measures for *moderate* dry eyes include use of anti-inflammatory agents, lifitegrast (Xiidra), topical corticosteroids, systemic omega-3 fatty acids supplements, varenicline nasal spray (Tyrvaya), or topical perfluorohexyloctane (Miebo)
- For severe dry eye, in addition to the above-mentioned treatments, systemic cholinergics, systemic anti-inflammatories, mucolytic agents, autologous serum tears, contact lenses, permanent punctal occlusion, and tarsorrhaphy are recommended
- No clinical trials have been published comparing any of the agents in this class, but all have demonstrated efficacy against vehicle

# Ophthalmics, Anti-Inflammatory/Immunomodulators

- Vernal keratoconjunctivitis (VKC) causes chronic bilateral conjunctivitis and is frequently associated with significant risk of progressive corneal damage, which can result in vision loss
- The 2023 AAO conjunctivitis Preferred Practice Pattern states that topical corticosteroids are usually needed to control signs and symptoms for acute exacerbations of VKC
- They also indicate that cyclosporine 0.05% has demonstrated effectiveness for severe VKC and for preventing seasonal recurrence



# Otic Antibiotics

# Otic Antibiotics

## FDA-Approved Indications

Drug Name	Manufacturer	Indication(s)
ciprofloxacin ( <i>Cetra</i> xal <sup>®</sup> ) <sup>1</sup>	generic, Wraser	<ul style="list-style-type: none"><li>Acute otitis externa due to susceptible isolates of <i>Pseudomonas aeruginosa</i> or <i>Staphylococcus aureus</i> in pediatrics (age 1 year and older) and adults</li></ul>
ciprofloxacin/dexamethasone ( <i>Cipro</i> dex <sup>®</sup> Otic) <sup>2</sup>	Alcon	<ul style="list-style-type: none"><li>Acute otitis media in pediatric patients (age 6 months and older) with tympanostomy tubes</li><li>Acute otitis externa in pediatric (age 6 months and older), adult, and elderly patients</li></ul>
ciprofloxacin/fluocinolone acetonide ( <i>Otovel</i> <sup>®</sup> ) <sup>3</sup>	Arbor	<ul style="list-style-type: none"><li>Acute otitis media in pediatric patients (age 6 months and older) with tympanostomy tubes due to <i>S. aureus</i>, <i>Streptococcus pneumoniae</i>, <i>Haemophilus influenzae</i>, <i>Moraxella catarrhalis</i>, and <i>P. aeruginosa</i></li></ul>
ciprofloxacin/hydrocortisone ( <i>Cipro</i> HC <sup>®</sup> Otic) <sup>4</sup>	Alcon	<ul style="list-style-type: none"><li>Acute otitis externa in adult and pediatric patients (1 year and older) due to <i>P. aeruginosa</i>, <i>S. aureus</i>, and <i>Proteus mirabilis</i></li></ul>
neomycin sulfate/colistin sulfate/ thonzonium bromide/ hydrocortisone ( <i>Coly-mycin</i> <sup>®</sup> S) <sup>5</sup>	Endo	<ul style="list-style-type: none"><li>Treatment of superficial bacterial infections of the external auditory canal in adult and pediatric patients (1 year and older)</li><li>Treatment of infections of mastoidectomy and fenestration cavities in adult and pediatric patients (1 year and older)</li></ul>
neomycin sulfate/polymyxin B/ hydrocortisone <sup>6</sup>	generic	<ul style="list-style-type: none"><li>Treatment of superficial bacterial infections of the external auditory canal in adults and pediatric patients (2 years and older)</li></ul>
ofloxacin <sup>7</sup>	generic	<ul style="list-style-type: none"><li>Otitis externa in adults and pediatric patients (6 months and older) due to <i>Escherichia coli</i>, <i>P. aeruginosa</i>, and <i>S. aureus</i></li><li>Chronic suppurative otitis media in patients 12 years and older with perforated tympanic membranes due to <i>P. mirabilis</i>, <i>P. aeruginosa</i>, and <i>S. aureus</i></li><li>Acute otitis media in pediatric patients (1 year and older) with tympanostomy tubes due to <i>H. influenzae</i>, <i>M. catarrhalis</i>, <i>P. aeruginosa</i>, <i>S. aureus</i>, and <i>S. pneumoniae</i></li></ul>

# Otic Antibiotics

- Over 80% of children experience acute otitis media by age three years
- The American Academy of Otolaryngology - Head and Neck Surgery Foundation (AAO-HNSF) guidelines for the management of acute otitis externa (AOE) in patients > 2 years of age recommend topical preparations for initial therapy of diffuse, uncomplicated AOE
- A topical aminoglycoside combined with a second antibiotic and a topical steroid is commonly prescribed to treat AOE
- While the addition of a corticosteroid may be of benefit in reducing inflammation, some consider its use unnecessary

# Otic Antibiotics

- For acute otitis media, consensus guidelines recommend systemic antibiotics as first line therapy
- Otic antibiotics provide an alternative to other topical antibiotics in the treatment of acute otitis media in children with tympanostomy tubes
- For chronic suppurative otitis media (CSOM), aminoglycosides or fluoroquinolones can be used
- Aminoglycosides are not recommended to be used if the tympanic membrane is perforated
- Fluoroquinolones are not associated with ototoxicity, and ofloxacin is considered safe in cases of a perforated tympanic membrane

# Otic Antibiotics

## *Clinical and Product Update*

- FDA approved first generic for Cipro HC otic suspension



# Oral and Inhaled Pulmonary Arterial Hypertension Agents

# Oral and Inhaled Pulmonary Arterial Hypertension Agents

Drug	Manufacturer	Indication(s)
<b>Oral Agents</b>		
ambrisentan (Letairis®)	generic, Gilead	<p>Treatment of pulmonary arterial hypertension (PAH) (World Health Organization [WHO] Group I) to improve exercise ability and delay clinical worsening</p> <p>In combination with tadalafil to reduce the risks of disease progression and hospitalization for worsening PAH, and to improve exercise ability</p>
bosentan (Tracleer®)	generic, Actelion	<p>Treatment of PAH (WHO Group I) in patients with WHO Class II to IV symptoms, to improve exercise ability and decrease clinical worsening</p> <p>Treatment of idiopathic or congenital PAH to improve pulmonary vascular resistance (PVR) in pediatric patients aged <math>\geq 3</math> years which is expected to result in an improvement in exercise ability</p>
macitentan (Opsumit®)	Actelion	Treatment of PAH (WHO Group I) to reduce the risks of disease progression and hospitalization for PAH
macitentan/tadalafil (Opsyntvi®)	Actelion	Treatment of PAH (WHO Group I) in adult patients of WHO functional class (FC) II-III
riociguat (Adempas®)	Bayer	<p>Persistent/recurrent chronic thromboembolic pulmonary hypertension (CTEPH) (WHO Group IV) after surgical treatment or inoperable CTEPH to improve exercise capacity and WHO functional class</p> <p>PAH (WHO Group I) to improve exercise capacity, improve WHO functional class, and to delay clinical worsening</p>
selexipag (Uptravi®)	Actelion	Treatment of PAH (WHO Group I) to delay disease progression and reduce the risk of hospitalization for PAH
sildenafil (Liqrev®)	CMP	Treatment of PAH (WHO Group I) to improve exercise ability and delay clinical worsening in adults

# Oral and Inhaled Pulmonary Arterial Hypertension Agents

Drug	Manufacturer	Indication(s)
<b>Oral Agents</b>		
sildenafil (Revatio®)	generic, Pfizer/Viatris	Treatment of PAH (WHO Group I) to improve exercise ability and delay clinical worsening in adults  Treatment of PAH (WHO Group I) to improve exercise ability in patients 1 to 17 years of age, and to improve pulmonary hemodynamics thought to underly improvements in exercise in pediatric patients too young to perform standard exercise testing
tadalafil (Adcirca®)	generic, Eli Lilly	Treatment of PAH (WHO Group I) to improve exercise ability
tadalafil (Tadliq®)	CMP	Treatment of PAH (WHO Group I) to improve exercise ability
treprostинil (Orenitram®)	United Therapeutics	Treatment of PAH (WHO Group I) to delay disease progression and to improve exercise capacity
<b>Inhalation Agents</b>		
iloprost (Ventavis®)	Actelion	Treatment of PAH (WHO Group I) to improve a composite endpoint consisting of exercise tolerance, symptoms (New York Heart Association [NYHA] Class), and lack of deterioration
treprostинil (Tyvaso®, Tyvaso DPI®)	United Therapeutics	Treatment of PAH (WHO Group I) to increase exercise ability  Treatment of pulmonary hypertension associated with interstitial lung disease (PH-ILD; WHO Group 3) to improve exercise ability

# Oral and Inhaled Pulmonary Arterial Hypertension Agents

- Pulmonary Arterial Hypertension (PAH) affects 15 to 50 people per million, with fewer than 50,000 total cases in the US
- Pulmonary hypertension (PH) is characterized by an increase in pulmonary arterial pressure and secondary right ventricular failure
- This is defined as a resting mean pulmonary arterial pressure (mPAP)  $\geq 20$  mm Hg
- Although the number of approved therapies for PAH has grown in the past years, the prognosis is still poor, with a 3-year mortality rate estimated at 21%

# Oral and Inhaled Pulmonary Arterial Hypertension Agents

- The World Health Organization (WHO) classifies PH patients into 5 groups based on etiology
  - Group I refers to pulmonary arterial hypertension (PAH)
  - Group II refers to PH due to left heart disease
  - Group III refers to PH due to lung disease
  - Group IV refers to PH due to blood clots in the lungs
  - Group V refers to PH due to blood and other rare disorders
- In 2019, the American College of Chest Physicians (CHEST) updated their 2014 guidelines on therapy for PAH in adults

# Oral and Inhaled Pulmonary Arterial Hypertension Agents

- In treatment-naïve patients with WHO Functional Classification (FC) II or WHO FC III without rapid disease progression or poor prognosis, initial combination therapy with ambrisentan and tadalafil is suggested
- Monotherapy with ambrisentan, sildenafil, bosentan, macitentan, tadalafil, or riociguat is considered as an alternative in patients who are unwilling to take or cannot tolerate combination therapy
- For treatment-naïve patients with WHO FC IV, initial therapy with a parenteral prostanoid agent is recommended
- If the patient cannot comply with parenteral administration, an inhaled prostanoid in combination with an oral endothelin receptor antagonist (ERA) or an oral phosphodiesterase type-5 (PDE-5) inhibitor are alternatives

# Oral and Inhaled Pulmonary Arterial Hypertension Agents

- If symptoms persist despite treatment with an oral ERA or PDE-5 inhibitor, addition of an inhaled prostanoid is suggested
- In patients with WHO FC III and continued disease progression while on oral mono- or combination therapy, addition of a parenteral or inhaled prostanoid may be considered
- In patients with WHO FC III or IV and an inadequate response to initial therapy with mono- or combination therapy, a second or third class of PAH agents should be added

# Oral and Inhaled Pulmonary Arterial Hypertension Agents

- Per the 2022 European Society of Cardiology (ESC) and the European Respiratory Society (ERS), selexipag may be added to ERA and PDE-5 inhibitor therapy in select patients
- Sequential drug combination therapy includes the addition of selexipag to ERAs and/or PDE-5 inhibitors and the addition of oral treprostинil to ERA, PDE-5 inhibitor, or riociguat monotherapy
- The same guidelines advise inhaled treprostинil may be considered in patients with PH-interstitial lung disease (ILD)

# Oral and Inhaled Pulmonary Arterial Hypertension Agents

## *Clinical and Product Updates*

- REMS updated Letairis (ambrisentan) to include embryofetal toxicity risk in the Administrative Information section of REMS document



# Thrombopoiesis Stimulating Agents

# Thrombopoiesis Stimulating Agents

Drug	Manufacturer	Indication(s)
avatrombopag (Doptelet®)	Akarx	<p>Treatment of thrombocytopenia in adults <b>and pediatric patients ≥ 1 year of age</b> with chronic immune thrombocytopenia (ITP) who have had an insufficient response to a previous treatment</p> <p>Treatment of thrombocytopenia in adult patients with chronic liver disease (CLD) who are scheduled to undergo a procedure</p> <ul style="list-style-type: none"><li>▪ Avatrombopag should not be used in an attempt to normalize platelet counts in patients with CLD</li></ul>
eltrombopag choline (Alvaiz™)	Teva	<p>Treatment of thrombocytopenia in adult and pediatric patients ≥ 6 years of age with persistent or chronic ITP who have had an insufficient response to corticosteroids, immunoglobulins, or splenectomy</p> <ul style="list-style-type: none"><li>▪ Eltrombopag should only be used in patients with ITP whose degree of thrombocytopenia and clinical condition increase the risk for bleeding</li></ul> <p>Treatment of thrombocytopenia in adults with chronic hepatitis C virus (HCV) to allow the initiation and maintenance of interferon-based therapy</p> <ul style="list-style-type: none"><li>▪ Eltrombopag should be used only in patients with chronic HCV whose degree of thrombocytopenia prevents the initiation of interferon-based therapy or limits the ability to maintain interferon-based therapy</li><li>▪ Safety and efficacy have not been established in combination with direct acting antiviral agents used without interferon for treatment of chronic HCV infection</li></ul> <p>Treatment of adults with severe aplastic anemia who have had an insufficient response to immunosuppressive therapy</p> <p>Eltrombopag is not indicated for the treatment of myelodysplastic syndrome (MDS)</p>

# Thrombopoiesis Stimulating Agents

Drug	Manufacturer	Indication(s)
eltrombopag olamine (Promacta®)	Novartis	<p>Treatment of thrombocytopenia in adult and pediatric patients <math>\geq</math> 1 year of age with persistent or chronic ITP who have had an insufficient response to corticosteroids, immunoglobulins, or splenectomy</p> <ul style="list-style-type: none"><li>▪ Eltrombopag should only be used in patients with ITP whose degree of thrombocytopenia and clinical condition increase the risk for bleeding</li><li>▪ Eltrombopag should not be used in an attempt to normalize platelet counts</li></ul> <p>Treatment of thrombocytopenia in patients with chronic HCV to allow the initiation and maintenance of interferon-based therapy</p> <ul style="list-style-type: none"><li>▪ Eltrombopag should be used only in patients with chronic HCV whose degree of thrombocytopenia prevents the initiation of interferon-based therapy or limits the ability to maintain interferon-based therapy</li><li>▪ Safety and efficacy have not been established in combination with direct acting antiviral agents approved for treatment of chronic HCV infection</li><li>▪ Eltrombopag should not be used in an attempt to normalize platelet counts</li></ul> <p>In combination with standard immunosuppressive therapy for first-line treatment of adult and pediatric patients <math>\geq</math> 2 years of age with severe aplastic anemia</p> <p>Treatment of patients with severe aplastic anemia who have had an insufficient response to immunosuppressive therapy</p> <p>Eltrombopag is not indicated for the treatment of MDS</p>

# Thrombopoiesis Stimulating Agents



Drug	Manufacturer	Indication(s)
fostamatinib disodium hexahydrate (Tavalisse®)	Rigel	Treatment of thrombocytopenia in adult patients with chronic ITP who have had an insufficient response to a previous treatment
lusutrombopag (Mulgleta®)	Shionogi	Treatment of thrombocytopenia in adult patients with CLD who are scheduled to undergo a procedure Lusutrombopag should not be used in attempt to normalize platelet counts in patients with CLD
Rilzabrutinib (Wayrilz®)	Genzyme /Sanofi	Treatment of adults with persistent or chronic ITP who have had an insufficient response to a previous treatment
romiplostim (Nplate®)	Amgen	Treatment of pediatric patients $\geq$ 1 year of age with ITP for $\geq$ 6 months who have had an insufficient response to corticosteroids, immune globulins, or splenectomy Treatment of adults with ITP who have had an insufficient response to corticosteroids, immunoglobulins, or splenectomy To increase survival in adults and in pediatric patients (including term neonates) acutely exposed to myelosuppressive doses of radiation (Hematopoietic Syndrome of Acute Radiation Syndrome [HSARS]) <ul style="list-style-type: none"> <li>▪ Romiplostim is not indicated to treat thrombocytopenia due to MDS or any cause of thrombocytopenia other than ITP</li> <li>▪ Romiplostim should only be used in patients with ITP whose degree of thrombocytopenia and clinical condition increases their risk for bleeding</li> <li>▪ Romiplostim should not be used in an attempt to normalize platelet counts</li> </ul>

# Thrombopoiesis Stimulating Agents

- Thrombocytopenia occurs in 78% of patients with chronic liver disease (CLD) with cirrhosis or fibrosis, and approximately 6% of CLD patients without cirrhosis
- Per the 2019 international consensus report on primary immune thrombocytopenia (ITP), treatment decisions should be individualized depending on the extent of bleeding, platelet count, patient age, presence of fatigue, assessment of risk factors for bleeding, patient preference, and access to care

# Thrombopoiesis Stimulating Agents

- Corticosteroids continue to be first-line therapy for the treatment of ITP in adults
- Subsequent treatments with strong evidence include rituximab, eltrombopag (Promacta), avatrombopag (Doptelet), and romiplostim (Nplate), as well as fostamatinib (Tavalisse)
- Subsequent therapies with less robust evidence include azathioprine, cyclophosphamide, cyclosporine, danazol, dapsone, mycophenolate mofetil, and vinca alkaloids

# Thrombopoiesis Stimulating Agents

- The 2019 American Society of Hematology (ASH) evidence-based practice guidelines for the management of ITP recommend observation or corticosteroids based on platelet count
- Treatment decisions should consider the severity of thrombocytopenia, comorbid conditions, use of antiplatelet or anticoagulant drugs, upcoming procedures, and patient age
- For adults with ITP for  $\geq 3$  months who are corticosteroid-dependent or unresponsive to steroids, treatment with eltrombopag or romiplostim is suggested
- Either IVIG or anti-D may be used as a first-line therapy if corticosteroids are contraindicated

# Thrombopoiesis Stimulating Agents

- Thrombopoietin receptor agonists (TPO-RAs) may be considered for patients at risk for bleeding who have failed at least 1 other therapy and who relapse after splenectomy or have a contraindication to splenectomy
- TPO-RAs may also be considered in patients at risk for bleeding who have not had a splenectomy and who have failed corticosteroids or IVIG
- In newly diagnosed children with non-life-threatening mucosal bleeding and/or decreased health-related quality of life, prednisone is suggested rather than IVIG or anti-D
- If these patients are unresponsive to first-line treatment, TPO-RAs are suggested

# Thrombopoiesis Stimulating Agents

- Pharmacotherapy for aplastic anemia includes immunosuppressive agents, hematopoietic growth factors, and fludarabine
- Promacta is also indicated to treat first-line and refractory severe aplastic anemia, including in pediatric patients
- Monotherapy with hematopoietic growth factors is not recommended for newly diagnosed patients

# Thrombopoiesis Stimulating Agents

## *Clinical and Product Updates*

- Nplate (romiplostim) PI was updated with addition of DVT, pulmonary embolism, and MI as adverse drug reactions in the ITP patient population
- Language regarding testing for suspected neutralizing antibodies was removed



# Ulcerative Colitis

# Ulcerative Colitis

Drug	Manufacturer	Indication(s)	
		Treatment	Maintenance
<b>Oral Prodrug Forms</b>			
balsalazide (Colazal®)	generic, Salix	Mildly to moderately active ulcerative colitis (UC) in patients $\geq$ 5 years	--
olsalazine (Dipentum®)	Meda/Mylan	--	Maintenance of remission of UC in patients intolerant of sulfasalazine
sulfasalazine (Azulfidine®, Azulfidine EN-tabs®)	generic*, Pharmacia/ Pfizer	<p>Mildly to moderately active UC Adjunctive therapy in severe UC</p> <p>Other: Enteric-coated tablets are indicated in patients with UC who cannot take uncoated sulfasalazine tablets because of gastrointestinal (GI) intolerance</p> <p>Treatment of rheumatoid arthritis that has not responded adequately to salicylates or other nonsteroidal anti-inflammatory agents (NSAIDs)</p> <p>Treatment of pediatric patients with polyarticular juvenile rheumatoid arthritis who have not responded adequately to salicylates or other NSAIDs</p>	Maintenance of remission of UC

# Ulcerative Colitis

Drug	Manufacturer	Indication(s)	
		Treatment	Maintenance
<b>Oral Delayed-Release Forms</b>			
mesalamine delayed-release tablets (Asacol® HD)	Zydus, Allergan	Moderately active UC	--
mesalamine delayed-release capsules (Delzicol®)	generic, Allergan	Mildly to moderately active UC in patients $\geq$ 5 years	Maintenance of remission of UC in adults
mesalamine MMX delayed-release tablets (Lialda®)	generic, Shire US	Mildly to moderately active UC in pediatric patients $\geq$ 24 kg and adults	Maintenance of remission of mildly to moderately active UC in adults
mesalamine extended-release capsules (Pentasa®)	Sun, Shire US	Mildly to moderately active UC	--
mesalamine extended-release capsules (Apriso®)	generic, Salix	--	Maintenance of remission of UC in adults

# Ulcerative Colitis

Drug	Manufacturer	Indication(s)	
		Treatment	Maintenance
<b>Rectal Forms</b>			
budesonide rectal foam (Uceris®)	generic, Salix	Mildly to moderately active UC extending up to 40 cm from the anal verge	--
mesalamine enemas (Rowasa®)	generic, Meda/Mylan	Mildly to moderately active distal UC, proctosigmoiditis, or proctitis	--
mesalamine enemas sulfite-free (sfRowasa®)	generic, Meda/Mylan	Mildly to moderately active distal UC, proctosigmoiditis, or proctitis	--
mesalamine suppositories (Canasa®)	generic, Allergan	Mildly to moderately active ulcerative proctitis	--
<b>Oral Corticosteroids</b>			
budesonide extended-release tablets (Uceris®)	generic, Santarus	Mildly to moderately active UC	--

# Ulcerative Colitis

- Around 1 to 1.5 million people in the US have Ulcerative Colitis (UC)
- UC is a chronic inflammatory disease primarily affecting the colon and rectum
- It is characterized by superficial infiltration of the bowel wall by inflammatory white cells, resulting in multiple mucosal ulcerations and crypt abscesses
- Aminosalicylates remain first-line treatment options for mild to moderate active UC
- The rectal mesalamine products achieve high luminal concentrations of the active component, 5-aminosalicylic acid (5-ASA, mesalamine), while minimizing adverse events from systemic absorption

# Ulcerative Colitis

- Second-line therapy with a course of oral or rectal steroids is indicated for induction therapy in patients with mild to moderate disease who do not respond to oral and rectal mesalamine agents or in patients with moderate to severe disease
- In patients with severe or refractory UC symptoms, oral corticosteroids are indicated
- The 2013 AAFP guidelines for the diagnosis and treatment of UC recommend 5-ASA (mesalamine) via suppository or enema as first-line for patients with proctitis or proctosigmoiditis, respectively

# Ulcerative Colitis

- Patients unable to tolerate rectally administered 5-ASA therapy may try oral preparations
- Oral 5-ASA is effective in patients with active mild to moderate UC extending from the proximal to the sigmoid colon
- A 2022 Rapid Evidence Review from AAFP states mesalamine being considered more potent than sulfasalazine
- Budesonide (Uceris), adalimumab, golimumab, vedolizumab, ustekinumab, and tofacitinib were not FDA-approved to treat UC at the time these guidelines were developed

# Ulcerative Colitis

- The 2019 American College of Gastroenterology (ACG) clinical guidelines state treatment selection for UC should be based not only on inflammatory activity but also on disease prognosis
- In general, mildly active proctitis and distal UC are treated with rectal 5-ASA
- Oral 5-ASA agents are used, if needed, as add-on for distal UC or to treat extensive disease
- In patients with mildly to moderately active UC who are intolerant or non-responsive to 5-ASA, oral budesonide is recommended to induce remission
- Moderately active UC should be treated with budesonide
- With the exception of corticosteroids, the medication used to induce remission should be continued as maintenance therapy

# Ulcerative Colitis

- The American Gastroenterological Association (AGA) developed 2019 practice guidelines for the treatment of mild to moderate UC
- They recommend standard-dose mesalamine, balsalazide, or olsalazine for induction and maintenance treatment in patients with extensive mild to moderate UC
- High-dose oral mesalamine combined with rectal 5-ASA may be required for patients with suboptimal response to standard-dose therapy, or in those with moderate or extensive disease
- Oral prednisone or budesonide may be added in those refractory to optimized oral and rectal 5-ASA

# Ulcerative Colitis

- The AGA developed 2020 practice guidelines for moderate to severe UC
- First line treatments include infliximab (Remicade®, biosimilars), adalimumab (Humira®, biosimilars), golimumab (Simponi®), vedolizumab (Entyvio®), tofacitinib (Xeljanz®, Xeljanz® XR), or ustekinumab (Stelara®, biosimilars)
- Long-term management of patients with moderate to severe disease can include biologic agents, tofacitinib, or immunomodulators
- With the exception of corticosteroids or cyclosporine, if the agent selected for inducing remission is effective, it is usually continued as maintenance therapy

# Ulcerative Colitis

- In 2024, the AGA published guidelines on pouchitis and inflammatory pouch disorders
- In patients with UC who have undergone ileal pouch-anal anastomosis (IPAA) and experience recurrent pouchitis with inadequate response to antibiotics, the AGA does not make a recommendation in favor of or against use of mesalamine for treatment of pouchitis

# Supplemental Rebate Drug Class Review

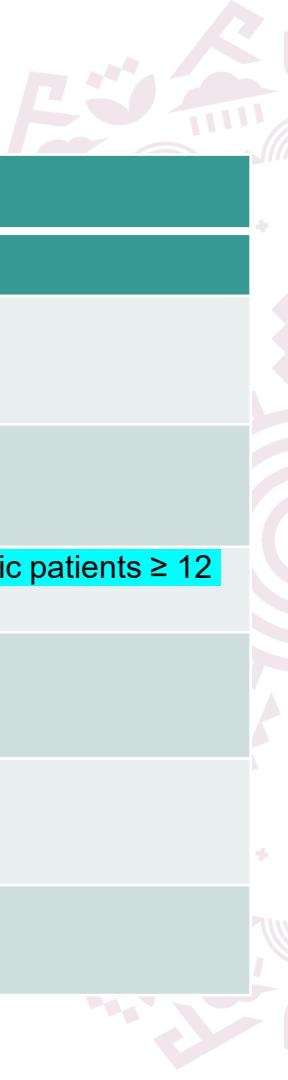
Hind Douiki, PharmD





# Hereditary Angioedema Agents

# Hereditary Angioedema Agents



Drug	Manufacturer	Indication(s)
<b>Prophylaxis</b>		
berotralstat (Orladeyo®)	BioCryst	Routine prophylaxis to prevent HAE attacks in ages $\geq 12$ years
C1-esterase INH [Human] (Cinryze®)	Takeda	Routine prophylaxis to prevent HAE attacks in ages $\geq 6$ years
garadacimab-gxii (Andembry®)	CSL Behring	Routine prophylaxis to prevent HAE attacks in adults and pediatric patients $\geq 12$ years
C1-esterase INH [Human] (Haegarda®)	CSL Behring	Routine prophylaxis to prevent HAE attacks in ages $\geq 6$ years
donidalorsen (Dawnzera®)	Ionis	Routine prophylaxis to prevent HAE attacks in ages $\geq 12$ years
lanadelumab-flyo (Takhzyro®)	Takeda	Routine prophylaxis to prevent HAE attacks in ages $\geq 2$ years

# Hereditary Angioedema Agents

Drug	Manufacturer	Indication(s)
<b>Treatment</b>		
ecallantide (Kalbitor®)	Takeda	Treatment of acute HAE attacks in ages $\geq$ 12 years
icatibant (Firazyr®)	generic, Shire	Treatment of acute HAE attacks in ages $\geq$ 18 years
C1-esterase INH [Human] (Berinert®)	CSL Behring	Treatment of acute HAE facial, laryngeal, or abdominal attacks in adult and pediatric patients Safety and efficacy for prophylactic therapy have not been established
rhC1-INH [recombinant] (Ruconest®)	Pharming Healthcare	Treatment of acute attacks in adult and adolescent patients with HAE Effectiveness has not been established in HAE patients with laryngeal attacks
sebetalstat (Ekterly®)	KalVista	Treatment of acute HAE attacks in ages $\geq$ 12 years

# Hereditary Angioedema Agents

- Hereditary angioedema (HAE) is a rare, dominant autosomal genetic disorder that affects approximately 6,000 to 9,000 individuals in the US
- Patients with HAE have low levels of endogenous or functional C1 esterase inhibitor (C1-INH)
- HAE is characterized by recurrent episodes of nonpruritic, nonpitting, SC or submucosal edema involving the skin or mucosal tissues of the upper respiratory and GI tracts
- Although swelling can resolve spontaneously in several days, without treatment laryngeal edema may be fatal and the pain of GI attacks can be incapacitating

# Hereditary Angioedema Agents

- Symptoms can begin as early as 2 years of age and persist throughout life with unpredictable severity and frequency of attacks
- It is thought that minor trauma and stress can lead to an attack; however, many attacks occur without any apparent trigger
- There are 2 types of C1-INH deficient HAE. The most common type (Type I), in which the body does not produce enough C1-INH, occurs in about 85% of patients with the condition
- Type II HAE is characterized by the presence of normal or high levels of a dysfunctional C1-INH

# Hereditary Angioedema Agents

- HAE prophylaxis is needed to reduce potential edema caused by a stressor or procedure likely to precipitate an attack (short-term prophylaxis) or to decrease the number and severity of angioedema attacks (long-term prophylaxis)
- The 2020 US Hereditary Angioedema Association (HAEA) guidelines for the management of HAE recommends short-term prophylaxis prior to medical, dental, or surgical procedures
- As disease severity may change over time, the need for continued long-term prophylaxis should be assessed periodically
- In addition, patients receiving prophylactic therapy should also have access to on-demand treatment for acute attacks
- The need for long-term prophylaxis should be made based on attack frequency, attack severity, comorbid conditions, access to treatment, and patient experience and preference

# Hereditary Angioedema Agents

- The 2021 World Allergy Organization (WAO) and European Academy of Allergy and Clinical Immunology (EAACI) issued an update to the 2017 guidelines on the management of HAE
- The revised guidelines recommend Cinryze, Haegarda, Takhzyro, or Orladeyo as first line agents for long-term prophylaxis
- Androgens are suggested as second-line long-term prophylaxis
- HAE attacks should be treated with Berinert, Ruconest, Kalbitor, or Firazyr
- No one agent is recommended over another

# Hereditary Angioedema Agents

- No head-to-head studies have been performed for the agents in this class
- Per current clinical guidelines, one agent is not preferred over another among first-line therapies for the treatment of HAE attacks



# Pituitary Suppressive Agents, LHRH

# Pituitary Suppressive Agents, LHRH

Drug	Manufacturer	Indication(s)			
		Endometriosis	Central Precocious Puberty	Prostate Cancer	Uterine Leiomyomata (Fibroids)
elagolix <sup>†</sup> (Orilissa <sup>®</sup> )	Abbvie	X			
elagolix, estradiol and norethindrone acetate; elagolix <sup>‡</sup> (Oriahnn <sup>®</sup> )	Abbvie				X <sup>‡</sup>
goserelin <sup>§</sup> (Zoladex <sup>®</sup> 1-month implant)	Tersera	X		X*	
goserelin (Zoladex <sup>®</sup> 3-month implant)	Tersera			X*	
histrelin subcutaneous implant (Supprelin LA <sup>®</sup> )	Endo		X		
histrelin subcutaneous implant (Vantas <sup>®</sup> )	Endo			X*	

# Pituitary Suppressive Agents, LHRH

Drug	Manufacturer	Indication(s)			
		Endometriosis	Central Precocious Puberty	Prostate Cancer	Uterine Leiomyomata (Fibroids)
leuprolide emulsion (Camcevi®)	Accord			X	
leuprolide acetate solution	generic			X	
leuprolide acetate suspension (Eligard®)	Tolmar			X	
leuprolide acetate suspension (Fensolvi®)	Tolmar		X		
leuprolide acetate suspension (Lupron Depot® 1-month and 3-month)	Abbvie	X			X
leuprolide acetate suspension (Lupron Depot® 1-month, 3-month, 4-month, and 6-month)	Abbvie			X	
leuprolide acetate suspension	Cipla††			X**	

# Pituitary Suppressive Agents, LHRH



Drug	Manufacturer	Indication(s)			
		Endometriosis	Central Precocious Puberty	Prostate Cancer	Uterine Leiomyomata (Fibroids)
leuprolide acetate suspension (Lupron Depot-Ped® 1-month and 3-month, 6-month)	Abbvie		X		
leuprolide acetate suspension and norethindrone tablets (Lupaneta Pack®)	Abbvie	X			
nafarelin nasal solution (Synarel®)	Pfizer	X	X		
relugolix (Orgovyx®)	Myovant Sciences			X**	
relugolix, estradiol hemihydrate and norethindrone acetate (Myfembree®)	Myovant Sciences	X†			X‡
triptorelin (Trelstar®)	Verity			X*	
triptorelin (Triptodur®)	Arbor		X		



# Pituitary Suppressive Agents, LHRH

- The pituitary suppressive, luteinizing hormone-releasing hormone (LHRH; also known as gonadotropin-releasing hormone [GnRH]) products included in this class are similar in their mechanism of action
- GnRH agonists appear to be comparably effective in suppressing the gonadotropic axis
- Central precocious puberty (CPP) or true precocious puberty is the premature activation of the hypothalamic-pituitary gonadal (HPG) axis
- CPP occurs in 1 out of 5,000 to 10,000 children and is much more common in girls than in boys

# Pituitary Suppressive Agents, LHRH

- Endometriosis is a condition characterized by the abnormal growth of endometrial cells similar to those that form inside of the uterus, but in a location outside of the uterus
- 10 to 15% of females of reproductive age in the US are affected
- The ACOG 2010 Management of Endometriosis guidelines (reaffirmed in 2020) recommend medical treatment
- This includes NSAIDs, oral contraceptives, GnRH agonists, and progestins
- According to a 2018 ACOG committee opinion on dysmenorrhea and endometriosis in adolescents (reaffirmed in 2021), endometriosis is the leading cause of secondary dysmenorrhea in this population
- Most patients will respond to NSAID and/or hormonal suppression therapy

# Pituitary Suppressive Agents, LHRH

- About 80% to 90% of CPP cases are idiopathic in females compared to < 50% in males
- GnRH agents approved for use in CPP include leuprolide acetate (Lupron Depot, Fensolvi), nafarelin (Synarel), histrelin (Supprelin LA), and triptorelin (Triptodur)
- Per the 2016 AAP, GnRH analog injections or histrelin implant are recommended for children with signs of early puberty
- Therapy should be discontinued once an acceptable age for puberty has been reached

# Pituitary Suppressive Agents, LHRH

- Up to 13% of men in the US are diagnosed with prostate cancer in their lifetime
- The estimated number of new cases of prostate cancer in the US is 313,780 in 2025
- LHRH agonists suppress luteinizing hormone production, thereby preventing signaling to the testicles to make testosterone and decreasing circulating testosterone levels
- This class of drugs includes leuprolide (Camcevi), leuprolide acetate (Eligard, Lupron Depot), goserelin (Zoladex), triptorelin (Trelstar), degarelix (Firmagon), and relugolix (Orgovyx)

# Pituitary Suppressive Agents, LHRH

- Uterine leiomyomata (fibroids) are benign tumors that develop in the smooth muscle of the uterus
- According to ACOG, treatment includes oral contraceptives and progestin-releasing intrauterine devices (IUDs), NSAIDs, mifepristone, and GnRH agonists
- GnRH agonist use, with or without hormonal “add-back”, is recommended for up to 2 years as a bridge to other treatment strategies
- FDA approved GnRH antagonist-containing products for the management of heavy menstrual bleeding associated with uterine fibroids include elagolix or relugolix and “add-back” therapy in premenopausal women



# New Drug Reviews

# New Drug Reviews

1. Anzupgo - delgocitini
2. Blujepa- gepotidacin
3. Jascayd - nerandomilast
4. Palsonify - paltusotine
5. Tryptyr - acoltremon
6. Wayrilz - rilzabrutinib



# Anzupgo (delgocitinib)

- Indicated for the topical treatment of moderate to severe chronic hand eczema (CHE) in adults who have had an inadequate response to, or for whom topical corticosteroids are not advisable
- Limitations of Use: use of Anzupgo in combination with other JAK inhibitors or potent immunosuppressants is not recommended
- Available as a cream (each gram contains 20 mg of delgocitinib)
- Apply twice daily to skin of the affected areas (only on the hands and wrists)
- Warnings
  - Serious Infections
  - Non-Melanoma Skin Cancers
  - Immunizations
  - Potential Risks Related to JAK Inhibition

# Anzupgo (delgocitinib)

- Adverse reactions include application site pain, paresthesia, pruritus, erythema, and bacterial skin infections including finger cellulitis, paronychia, other skin infections, leukopenia, and neutropenia
- There are no comparative trials for Anzupgo
- DELTA 1 and Delta 2 trials were phase 3, parallel, randomized, double-blind, and vehicle-controlled lasting 16 weeks
- Delta 3 was a 36-week, open-label, multi-site extension study
- DELTA 1 and DELTA 2 enrolled a total of 960 adults with moderate to severe CHE who had a history of inadequate response to, or for whom topical corticosteroids were not advisable

## Anzupgo (delgocitinib)

- Participants were randomly assigned 2:1 to twice-daily delgocitinib cream 20 mg/g or cream vehicle
- The primary endpoint was Investigator's Global Assessment for Chronic Hand Eczema (IGA-CHE) treatment success at week 16, defined as IGA-CHE score of 0 (clear) or 1 (almost clear, defined as only barely perceptible erythema)
- At week 16, a greater proportion of delgocitinib-treated patients versus cream vehicle patients had IGA-CHE treatment success (20% vs 10% in DELTA 1; 29% vs 7% in DELTA 2)
- The proportion of patients who reported adverse events was similar with delgocitinib (45% in DELTA 1 and 46% in DELTA 2) and the cream vehicle (51% in DELTA 1 and 45% in DELTA 2)

# Blujepa (gepotidacin)

- Indicated for the treatment of the following infections caused by susceptible microorganisms:
  - Uncomplicated urinary tract infections (uUTI) in females  $\geq$ 12 years weighing at least 40 kilograms (kg)
  - Uncomplicated urogenital gonorrhea in patients  $\geq$  12 years weighing at least 45 kg who have limited or no alternative treatment options
- Usage to Reduce Development of Drug-Resistant Bacteria
- For uUTI, the recommended dosage is 1,500 mg taken orally, twice daily for 5 days
- For Uncomplicated Urogenital Gonorrhea, the recommended dosage is 3,000 mg taken orally, followed by a second dose of 3,000 mg approximately 12 hours later

# Blujepa (gepotidacin)

- Available as 750 mg tablets
- Contraindicated in patients with a history of severe hypersensitivity to Blujepa
- Warnings:
  - QTc Prolongation
  - Acetylcholinesterase Inhibition
  - Hypersensitivity Reactions
  - Clostridioides difficile Infection
  - Development of Drug-Resistant Bacteria

# Blujepa (gepotidacin)

- Adverse reactions for uUTI use include diarrhea, nausea, abdominal pain, flatulence, headache, soft feces, dizziness, vomiting, and vulvovaginal candidiasis
- Adverse reactions for Uncomplicated Urogenital Gonorrhea use include diarrhea, nausea, abdominal pain, vomiting, flatulence, dizziness, soft feces, headache, fatigue, and hyperhidrosis
- The approval of Blujepa is based on results from the phase 3 EAGLE-2 and EAGLE-3 trials
- These were randomised, multicentre, double-blind, double-dummy, non-inferiority (10% margin) trials
- 3136 female adults ( $\geq 40$  kg) and pediatric patients ( $\geq 12$  years,  $\geq 40$  kg) with a confirmed uUTI were enrolled in the studies

# Blujepa (gepotidacin)

- Patients were randomly assigned (1:1) to receive oral gepotidacin (1500 mg twice daily for 5 days) or oral nitrofurantoin (100 mg twice daily for 5 days)
- In EAGLE-2, Blujepa demonstrated non-inferiority in therapeutic success which occurred in 50.6% of participants compared to 47.0% for nitrofurantoin
- In EAGLE-3, Blujepa demonstrated statistically significant superiority versus nitrofurantoin
- Therapeutic success occurred in 58.5% of participants compared to 43.6% for nitrofurantoin

# Blujepa (gepotidacin)

- EAGLE-1 was a phase 3, open-label, sponsor-blinded, multicentre, non-inferiority study
- 628 adults and pediatric patients ( $\geq 12$  years,  $\geq 45$  kg) with uncomplicated urogenital gonorrhoea were enrolled in the studies
- Participants were randomly allocated in a 1:1 ratio to receive either oral gepotidacin (two 3000 mg doses administered 10-12 h apart) or 500 mg intramuscular ceftriaxone plus 1 g oral azithromycin
- Microbiological success rates were 92.6% in the gepotidacin group and 91.2% in the ceftriaxone plus azithromycin group
- The gepotidacin group had higher rates of adverse events and drug-related adverse events

# Jascayd (nerandomilast)

- Indicated for the treatment of idiopathic pulmonary fibrosis (IPF) in adults and for the treatment of progressive pulmonary fibrosis (PPF) in adults
- Recommended dosage is 18 mg orally twice daily
- Available as 9 mg and 18 mg tablets
- Adverse reactions include diarrhea, COVID-19, upper respiratory tract infection, depression, weight decreased, decreased appetite, nausea, fatigue, headache, vomiting, back pain, and dizziness

# Jascayd (nerandomilast)

- There are no comparative trials for Jascayd
- The approval of Jascayd for IPF was based on 2 randomized, double-blind, placebo-controlled trials (FIBRONEER-IPF and Trial 2)
- Both trials evaluated nerandomilast in adults aged  $\geq 40$  years with IPF with or without background antifibrotic treatments (nintedanib or pirfenidone)
- Participants were required to have a forced vital capacity (FVC)  $\geq 45\%$  of predicted normal and a carbon monoxide diffusing capacity  $\geq 25\%$  of predicted normal, corrected for hemoglobin
- In FIBRONEER-IPF, study participants (n=1177) were randomly assigned 1:1:1 to receive nerandomilast 18 mg, nerandomilast 9 mg, or placebo twice daily for 52 weeks

## Jascayd (nerandomilast)

- Nerandomilast led to a slower decline in absolute change from baseline in FVC compared with placebo
- The adjusted mean decline was 106 mL and 122 mL in the nerandomilast 18 mg and 9 mg arms, respectively, compared with 170 mL with placebo arm
- In the nerandomilast 18 mg arm, across all background antifibrotic treatment subgroups (nintedanib, pirfenidone, or none), efficacy was found to be consistent with the overall population
- Among patients who received nerandomilast 9 mg twice daily with pirfenidone as the background antifibrotic treatment, efficacy was not achieved

# Jascayd (nerandomilast)

- Composite endpoint of time to first occurrence of acute interstitial lung disease exacerbation, first hospitalization for respiratory cause, or death was a key secondary outcome
- There was no statistically significant treatment difference in hazard ratio (HR) for nerandomilast 18 mg or 9 mg vs placebo
- In Trial 2, study participants (n=147) were randomly assigned 2:1 to receive nerandomilast 18 mg or placebo twice daily for 12 weeks
- Nerandomilast 18 mg with or without background antifibrotic treatment resulted in a reduction in FVC decline of 91 mL at week 12 compared with placebo

# Jascayd (nerandomilast)

- The approval for Jascayd for treatment of PPF in adults was based on data from the phase 3 FIBRONEER-ILD trial
- The randomized, double-blind, placebo-controlled study included 1178 adults with PPF with or without background treatment with nintedanib
- Enrolled patients were required to have a FVC  $\geq 45\%$  of predicted normal and a carbon monoxide diffusing capacity  $\geq 25\%$  of predicted normal, corrected for hemoglobin
- Participants were randomly assigned 1:1 to receive nerandomilast 18 mg, nerandomilast 9 mg, or placebo twice daily for 52 weeks

# Jascayd (nerandomilast)

- Findings showed treatment with Jascayd resulted in statistically significantly less decline in absolute change from baseline in FVC compared with placebo
- The adjusted mean decline was 86 mL in the nerandomilast 18 mg arm, 69 mL in the nerandomilast 9 mg arm, and 152 mL in the placebo arm
- Time to first occurrence of the composite endpoint of acute interstitial lung disease exacerbation, first hospitalization for respiratory cause, or death was a key secondary outcome
- Results showed no statistically significant difference in the HR for the nerandomilast 18 mg or 9 mg groups compared with placebo

# Palsonify (paltusotine)

- Indicated for the treatment of adults with acromegaly who had an inadequate response to surgery and/or for whom surgery is not an option
- Recommended initial dosage is 40 mg once daily
- After 2 to 4 weeks, based on IGF-1 levels, titrate to 60 mg once daily
- Available as 20 mg and 30 mg tablets
- Warnings
  - Cholelithiasis and its Complications
  - Hyperglycemia and Hypoglycemia
  - Cardiovascular Abnormalities
  - Thyroid Function Abnormalities
  - Steatorrhea and Malabsorption of Dietary Fats
  - Vitamin B12 Deficiency

# Palsonify (paltusotine)

- Adverse reactions include diarrhea, abdominal pain, nausea, decreased appetite, sinus bradycardia, hyperglycemia, palpitations, and gastroenteritis
- There are no comparative trials for Palsonify
- Approval was based on data from 2 randomized, double-blind, parallel group, placebo-controlled, phase 3 trials: PATHFNDR-1 and PATHFNDR-2
- The PATHFNDR-1 study included 111 adults with biochemically uncontrolled acromegaly who were either treatment-naïve, had no treatment within the last 4 months before screening, or were previously treated on a somatostatin receptor analog and then washed out of treatment during screening
- Study participants were randomly assigned to receive paltusotine (n=54) or placebo (n=57) for 24 weeks
- 56% of paltusotine-treated patients achieved biochemical control compared with 5% of those who received placebo

# Palsonify (paltusotine)

- Paltusotine-treated patients also had numerically lower severity of symptom scores associated with acromegaly, as measured by a patient-reported symptom severity instrument, compared with placebo
- PATHFINDER 2 included 58 patients who were previously biochemically controlled on injectable depot octreotide or lanreotide somatostatin analog formulations
- Participants were randomly assigned to receive paltusotine (n=30) or placebo (n=28) for 36 weeks
- 83% of patients who were treated with paltusotine maintained biochemical control vs 4% of the placebo group
- Numerically lower severity of symptoms scores were also observed in the paltusotine-treated patients compared with placebo

# Tryptyr (acoltremon)

- Indicated for the treatment of the signs and symptoms of dry eye disease
- Instill one drop in each eye twice daily
- Available as a 0.003% ophthalmic solution in a single-dose vial
- Warning: To avoid the potential for eye injury and contamination, do not touch the vial tip to the eye or other surface
- Adverse reaction is instillation site pain (50%)
- There are no comparative trials for Tryptyr
- The approval of Tryptyr was based on data from 2 randomized, double-blind, vehicle-controlled studies: COMET-2 and COMET-3

# Tryptyr (acoltremon)

- In both trials, patients with dry eye disease were randomly assigned to receive Tryptyr or vehicle eye drop twice daily for 90 days
- In the COMET-2 study, 42.6% of patients treated with Tryptyr (n=230) achieved at least a 10 mm increase in tear production at day 14, compared with 8.2% of the vehicle group (n=235)
- In the COMET-3 trial, 53.2% of patients treated with Tryptyr (n=232) achieved at least a 10 mm increase in tear production at day 14, compared with 14.4% of the vehicle group (n=234)

# Wayrilz (rilzabrutinib)

- Indicated for the treatment of adult patients with persistent or chronic ITP who have had an insufficient response to a previous treatment
- Recommended dosage is 400 mg orally twice daily
- Available as 400 mg tablets
- Warnings
  - Serious Infections
  - Hepatotoxicity, Including Drug-Induced Liver Injury
  - Embryo-Fetal Toxicity
- Adverse reactions include diarrhea, nausea, headache, abdominal pain, and COVID-19

# Wayrilz (riltzabrutinib)

- There are no comparative trials for Wayrilz
- LUNA 3 was a phase 3 randomized, double-blind, placebo-controlled trial which evaluated the safety and efficacy of riltzabrutinib in adults with ITP
- Participants had an unsustained response to either IV immunoglobulin or corticosteroids or had a documented intolerance or insufficient response to any ITP standard of care therapy
- Patients initially received 12 weeks of treatment during a double-blind treatment period
- Those who achieved platelet count response were eligible to continue treatment for the full 24 weeks
- An open-label period followed the end of the full 24-week blinded treatment period

# Wayrilz (riltzabrutinib)

- Participants were randomly assigned 2:1 to receive riltzabrutinib 400mg (n=133) or placebo (n=69) twice daily
- Concomitant ITP medications were allowed at least 2 weeks before the start of the study and throughout the double-blind period
- At 12 weeks, 64% of patients in the riltzabrutinib arm and 32% of patients in the placebo arm had achieved platelet count response
- 23% of patients treated with riltzabrutinib achieved durable platelet response compared with none receiving placebo
- Riltzabrutinib resulted in a longer duration of platelet response versus placebo

# Wayrilz (rilzabrutinib)

- Rilzabrutinib was associated with a faster time to first platelet response compared with placebo (36 days vs not reached with placebo)
- In the rilzabrutinib group, 33% of patients required rescue medication versus 58% of the placebo group
- During the open-label period, 10% of patients who were treated with rilzabrutinib during the double-blind period achieved a durable response for the first time

# Break and Executive Session



# Public Therapeutic Class Votes





# Future 2026 Meeting Dates:

May 19, 2026  
October 21, 2026