Asthma & COPD Medication List

LONG-TERM CONTROL MEDICATIONS (used for prevention / control of asthma, NOT treatment of acute exacerbations)

a. INHALED CORTICOSTEROIDS (ICS)

- Drug of choice for all levels of PERSISTENT asthma, most potent anti-inflammatory for asthma
- Inhibits release of airway inflammatory mediators including eosinophils, basophils, lung parenchyma, lymphocytes, macrophages, mast cells, and neutrophils. Also inhibits IgE synthesis, attenuates mucous secretion and eicosanoid generation, up-regulates beta-receptors, promotes vasoconstriction, suppresses inflammatory cell influx, and prevents / controls inflammation. Require 4-6 weeks of around-the-clock use for full effect; often misperceived as "rescuers" for acute attacks.
- Use ICS MDI's with **spacers** to minimize oropharyngeal drug deposition (e.g., oral candidiasis, dysphonia, cough). Other strategies: Give once daily inhalation if appropriate; **rinse mouth after each administration**.
- Although systemic effects are minimal, long-term use associated with osteoporosis / osteopenia; consider Ca++ supplements (1,000-1,500 mg/day) and vitamin D (400-800 u/day), particularly in perimenopausal women. May also slightly affect prepubertal growth in children with long-term use, decreasing adult height by approximately 1 cm. Long-term use of high-dose ICS is also associated with skin bruising, cataracts, and increased IOP. When stable, maintain patient at lowest effective dose.
- For mild to moderate persistent asthma, ICS dose response curve is relatively flat beyond low to moderate doses; medium dose ICS + LABA is usually preferred step to increasing ICS dose. For severe persistent asthma, maximizing ICS dose improves efficacy.

Medication (brand name)	Availability	Low daily dose, adult (Children 5-11 yo)	Medium daily dose, adult (Children 5-11 yo)	High daily dose, adult (Children 5-11 yo)	Notes
Beclomethasone (QVAR) $50/month	HFA MDI (100 inh/unit) 40, 80 mcg/inh	80-240 mcg ÷ BID (80-160 mcg ÷ BID)	>240-480 mcg ÷ BID (>160-320 mcg ÷ BID)	>480 mcg ÷ BID (>320 mcg ÷ BID)	• Increased potency due to increased lung deposition • DDI: itraconazole, atazanavir, ritonavir
Budesonide (Pulmicort Flexhaler) $30/month	DPI (120 inh/unit) 180 mcg/inh	180-600 mcg ÷ BID (180-400 mcg ÷ BID)	>600-1200 mcg ÷ BID (>400-800 mcg ÷ BID)	>1200 mcg ÷ BID (>800 mcg ÷ BID)	• "Twist, click, inhale" DPI
Ciclesonide (Alvesco) $150/month	HFA MDI (60, 120 inh/unit) 80, 160 mcg/inh	160-320 mcg ÷ BID	>320-640 mcg ÷ BID	>640 mcg ÷ BID	• May have least impact on growth, ↓ systemic exposure vs. other ICS • Prodrug, activated by lung esterases, metabolite → deactivated by CYP3A4
Fluticasone propionate (Flovent Diskus) $70-$130/month	DPI (60 inh/unit) 50 mcg/blister	100-300 mcg ÷ BID (100-200 mcg ÷ BID)	>300-500 mcg ÷ BID (>200-400 mcg ÷ BID)	>500 mcg ÷ BID (>400 mcg ÷ BID)	• Available in combination with LABA
Fluticasone propionate (Flovent HFA) $90-$200/month	HFA MDI (120 inh/unit) 44, 110, 220 mcg/inh	88-264 mcg ÷ BID (88-176 mcg ÷ BID)	>264-440 mcg ÷ BID (>176-352 mcg ÷ BID)	>440 mcg ÷ BID (>352 mcg ÷ BID)	• Available in combination with LABA
Mometasone furoate (Asmanex Twisthaler) $100-$130/month	DPI (30, 60, 120 inh/unit) 110, 220 mcg/inh	220 mcg daily (110 mcg daily)	>220-440 mcg ÷ BID (110 mcg daily)	>440 mcg ÷ BID (110 mcg daily)	• Remove cap as if you're opening a bottle of water

b. LONG-ACTING BETA2-AGONISTS (LABA)

- **NEVER USE AS MONOTHERAPY FOR ASTHMA** (no inherent anti-inflammatory effects, increases risk of respiratory-related death). Always use in combination with ICS. Not indicated for PRN use to relieve asthma symptoms. May be used as monotherapy in COPD with SA bronchodilator for PRN symptoms.
- Stimulates B2 receptors in airways, resulting in airway smooth muscle relaxation
- LABA + ICS appears to improve asthma control better than maximizing ICS dose for most patients (see discussion above under "Inhaled Corticosteroids")
- For patients ≥5 yo with moderate persistent asthma or asthma inadequately controlled on medium-dose ICS: the option to increase the ICS dose should be given equal weight to the option of adding LABA; pediatric and adolescent patients requiring a LABA should be prescribed a combination ICS/LABA product.
- Additional benefits demonstrated for nocturnal asthma symptoms, EIB prophylaxis (prophylaxis effects can last up to 12 hours, although chronic use shortens duration of effect < 5 hours)

Medication (brand name)	Availability	Dose	Notes
Salmeterol (Serevent Diskus) $150/month	DPI (60 inh/unit) 50 mcg/blister	50mcg BID- ages 4 yo thru adult	• Expires 6 weeks after opening foil pouch • Used **ONLY** as additional therapy for patients with asthma who are currently taking but are inadequately controlled on a long-term asthma control medication, such as an ICS o ↑ risk of asthma-related death with use of salmeterol alone • **REMS**: Communication program
Formoterol (Foradil Aerolizer) $180/month	DPI (60 inh/unit) 12 mcg/capsule	12mcg inhaled BID- ages 5 yo thru adult	• Expires 4 mos. storing in room temperature or labeled expiration date, whichever comes first • Several reports of patients swallowing capsule • EIB: 1 dry powder capsule inhaled via Aerolizer 15 min prior to exercise / allergen exposure • Full B2 agonist (SE: tremor/↑HR in elderly), fast onset (~5min)
Formoterol (Perforomist) $450/month	Inhalation solution 20 mcg/2mL	20 mcg inhaled BID by nebulization	
Indacaterol (Arcapta) $75/month	DPI (30 inh/unit) 75 mcg/capsule	75 mcg inhaled QD	• Transparent capsule, contains lactose
Arformoterol (Brovana) $450/month	Inhalation solution 15 mcg/2mL	15mcg inhaled BID (adult only)	

c. COMBINATION ICS + LABA

- Combination products preferred when prescribing both agents in the treatment of asthma.
- As with other ICS MDIs, use with **spacers** to minimize oropharyngeal drug deposition (e.g., oral candidiasis, dysphonia, cough); **rinse mouth after each administration**.

Medication (brand name)	Availability	Adult Dose	Child Dose	Notes
Fluticasone / salmeterol (Advair Diskus) $200/month	DPI (60 inh/unit) 100, 250, 500 mcg F / 50 mcg/blister S	1 inhalation BID COPD max dose: 250/50 mcg 1 inh BID	4-11yo: 100/50 mcg 1 inh BID	• Expires 6 weeks after opening foil pouch • Check for powder showing around device or grinding when opening, suggesting improper use
Fluticasone / salmeterol (Advair HFA) $200/month	HFA MDI (120 inh/unit) 45, 115, 230 mcg F / 21 mcg/blister S	2 inhalations BID (≥12 yo) COPD max dose: 250/50 mcg 1 inh BID	No indication	
Budesonide / formoterol (Symbicort HFA) $170/month	HFA MDI (120 inh/unit) 80, 160 mcg B / 4.5 mcg/inh F	2 inhalations BID (≥ 12 yo) COPD max dose: 160/4.5 mcg 2 inh BID	5-11 yo max dose: (NIH Guidelines): 80/4.5 mcg 2 inh BID	
Mometasone/formoterol (Dulera HFA) $230/month	HFA MDI (120 inh/unit) 100, 200 mcg M/5 mcg/inh F	2 inhalations BID (≥ 12 yo) Not indicated for COPD	No indication	

d. ANTILEUKOTRIENE

- None are indicated for the treatment of COPD as primary diagnosis; most studies conducted in mild and moderate persistent asthma
- Inhibits of leukotriene activity (leukotrienes are 100 to 1,000 x more potent than histamine as a bronchoconstrictor, attract inflammatory cells, ↑ mucous production)
- Considered 3rd line (after ICS + LABA) but may be particularly beneficial for aspirin-sensitive asthma, obesity, cigarette smokers, allergic rhinitis + asthma, and EIB
- May consider for patients experiencing difficulty with inhaled medications (e.g., children as young as 1 yo), but ICS remains drug of choice for all patients with persistent asthma
- Montelukast most popular due to convenience (once daily), lack of significant drug interactions or ADRs, multiple approved indications (allergic rhinitis, EIB prophylaxis), variety of dosage forms
- Failure = no response after 6 to 8 weeks

Medication (brand name)	Availability	Adult Dose	Child Dose	Notes
Montelukast (Singulair) $75-100/month	4, 5, 10mg tabs 5 mg chew tab	10mg QPM	6—14yo: 5 mg chew tab QPM 2—5yo: 4 mg chew tab QPM 1—5yo: 4 mg granules QPM	• Only LTA approved for exercise-induced bronchospasm (take 2 hrs prior to exercise, lasts 24 hours) and allergic rhinitis (note that nasal corticosteroids are most effective for AR) • Following postmarketing reports of depression and suicidal ideation in children taking montelukast, FDA review of all RCTs has found no cause-effect associated with LTAs. Nevertheless, close monitoring of behavior is warranted and further reviews are ongoing.
Zafirlukast (Accolate) $100/month	10, 20mg tabs	20mg BID	5-11 yo: 10-mg BID	• May increase theophylline and warfarin levels • Few postmarketing case reports of liver problems. Consider monthly ALT x 1 year. • Must take on an empty stomach (1 hr before or 2 hrs after eating) for max. absorption
Zileuton (Zyflo CR) $90/month	600mg tabs	1200mg BID (≥ 12 yo)	No indication in children	• The only LTA that inhibits leukotriene formation (others are leukotriene receptor blockers) • May increase theophylline and warfarin levels • May cause transient elevations in liver enzymes, usually within the first 2 to 3 months of treatment; but returns to normal even w/ continued tx. Check ALT monthly for the first 3 months of therapy, then intermittently thereafter.

e. METHYLXANTHINES

- Anti-inflammatory and bronchodilator, although mechanism of action is not well-understood and relative efficacy is only fair.
- 4th line consideration, if at all, because of toxicity risk, relatively difficult dosing, and drug interactions
  - ↑'s metabolism / ↓'s serum levels: diet (high protein), age (1-9 y.o.), drugs (phenobarbital, phenytoin, carbamazepine, rifampin), smoking
  - ↓'s metabolism / ↑'s serum levels: diet (high carbohydrate), systemic febrile viral illness, hypoxia, heart failure, age (< 6 months, elderly), drugs (cimetidine, macrolides, quinolones, ticlopidine)
- **NARROW THERAPEUTIC INDEX**: Wide interpatient variability, multiple factors affect serum levels. Keep serum levels low (5-12 mcg/mL)
- May be useful as an add-on in some patients requiring high dose corticosteroids

Medication (brand name)	Availability	Adult Dose	Child Dose	Notes
Theophylline (Slo-bid, Slo-Phyllin, Theo-Dur, Theo 24, Uniphyl) $20/month	• 100, 200, 250, 300 mg timed release caps; 100, 200, 300 mg timed release tabs; 80mg/15mL PO elixir	• 300-600mg daily or ÷ BID • Maximum dose: 800 mg/day or 16 mg/kg/day, whichever is lower	10 mg/kg/day	• ADRs including N/V, nervousness, HA and insomnia can occur even with normal serum levels. High levels may cause hypokalemia, hyperglycemia, tachycardia, arrhythmias, tremor, seizures, and death

f. MAST CELL STABILIZERS

- Stabilize mast cells and inhibit release of inflammatory mediators, but rarely used due to relatively low efficacy despite excellent safety profile
- Efficacy achieved after 2 to 4 weeks of consistent use; not effective for immediate relief of symptoms in acute asthma attack, no indication in COPD

Medication (brand name)	Availability	Adult Dose	Child Dose	Notes
Cromolyn Sodium $80-110/month	Solution for nebulization 100 mg/5mL, 20mg/2mL 5.2mg/actuation nasal spray	Inhale 20mg QID at regular intervals 1 spray into each nostril TID-QID	Inhale 20mg QID at regular intervals (≥ 2 years of age) 1 sprays TID-QID (≥ 2 years of age)	• Very well tolerated; side effects may include unpleasant taste in mouth, increased nasal irritation or burning, headache, hoarseness, cough, postnasal drip

g. PHOSPHODIESTERASE-4 INHIBITORS

- Selectively inhibits phosphodiesterase-4, increasing accumulation of intracellular cAMP, which is thought to decrease inflammatory activity
- **NOT** a bronchodilator, no indication in asthma without COPD
- May be added to reduce exacerbations for patients with FEV1 < 50% of predicted, chronic bronchitis, and frequent exacerbations

Medication (brand name)	Availability	Adult Dose	Child Dose	Notes
Roflumilast (Daliresp) $200/month	500 mcg tablets	500 mcg QD	No indication	• DDIs with strong CYP3A4 inhibitors/inducers: ↑levels with inhibitors: erythromycin, ketoconazole, fluvoxamine, cimetidine ↓levels with inducers: rifampin, phenobarb, carbamazepine, phenytoin,

h. ANTI-IGE THERAPY

- Indicated for allergic asthma uncontrolled by ICS + other drug therapies
- ↓ free IgE >96% after ~5-6 months; returns to baseline ~1 yr following discontinuation
- Efficacy: ~10-15% absolute risk reduction in exacerbations
- Limited to patients with baseline IgE 30-70 IU/mL and documented sensitization to perennial aeroallergen (e.g., dust mites, animal dander, mold, cockroaches)
- Difficult to predict which patients will respond to therapy
- Anaphylaxis (0.2% incidence) may occur, usually within 2 hrs of administration but has been reported up to 4 days later. Patients should be observed for 2 hours after first 3 injections, then for 30 minutes after subsequent injections, and should be provided with and trained on how to use self-injected epinephrine. ONLY ADMINISTER IN A SETTING CAPABLE OF MANAGING ANAPHYLAXIS.
- Although neoplasms have been reported in association with omalizumab (0.5% vs. 0.2% with placebo), causation has not been established

Medication (brand name)-manufacturer	Availability	Adult Dose	Child Dose	Notes
Omalizumab (Xolair)	Anti-IgE Antibody Powder for SQ inj, 150mg/vial	150-300mg Q4wks or 225-375mg q2wks (≥ 12 yo thru adult)	-	• Dosing based on baseline IgE and weight • Very expensive ($10,000 – 30,000 for medication alone) • Allows for modest reduction in ICS dose for many patients

RESCUE THERAPY / QUICK-RELIEF MEDICATIONS:

a. SHORT-ACTING BETA2-AGONISTS (SABA)

- First choice therapy for relief of acute symptoms and prevention of EIB. Every asthmatic patient should have inhaled SABA available for initial rescue therapy for exacerbations.
- Common ADRs include tachycardia and palpitations skeletal muscle tremor; hypokalemia can occur with high doses, especially when administered via nebulizer
- Patients with Arg/Arg B2-receptor genotype (15% of U.S. population, more common in African Americans) may experience airflow declines and worsening of asthma control when given SABA

Medication (brand name)	Availability	Adult Dose	Child Dose	Notes
Albuterol (generic solution) $20/month	Nebulizer solutions: 2.5 mg/3mL (0.083%) 5 mg/mL (0.5% solution) Syrup: 2 mg/5 mL (480 mL) Tablets: 2, 4 mg	1.25 – 5 mg q 4-8 hours PRN Exacerbation: 2.5-5 mg q20min x3 doses, then 2.5-10 mg q1-4hrs PRN or 10-15 mg/hr for continuous nebuliation	NIH dosing: ≤4 yo:0.63-2.5 mg q4-6hrs PRN ≥5 yo: 1.25-2.5 mg q4-8hr PRN Exacerbation ≤12 yo: 0.15 mg/kg/dose q 20 min x 3 doses, then 0.15-0.3 mg/kg (max: 10 mg) q 1-4hrs PRN or 0.5 mg/kg/hr continuous nebulization	• 90% of nebulized solutions enters the esophagus, resulting in more systemic ADRs vs. inhalation via MDI + spacer • SE: tremor, ↑nervous, ↑**HR** , ↑QT, headache, ↓K+, ↑ insulin secretion, ↑glucose esp. diabetics
Albuterol (AccuNeb)	Nebulizer solution: 0.63, 1.25/3 mL	2.5 mg TID-QID PRN, then 2.5-10 mg q 1-4hrs PRN; 10-15 mg/hr for continuous nebulization	2-12 yo: 0.63 - 1.25mg TID-QID PRN	
Albuterol (Proventil HFA, ProAir HFA,Ventolin HFA) $40/month	HFA MDI (200 inh/unit) 90 mcg/inhalation	2 inh q4-6 hours PRN	≥4 yo: same as adult dose	• EIB: 2 puffs 15 min before exercise • SE: tremor, ↑nervous, ↑HR, ↑QT, headache, ↓K+, ↑ insulin secretion, ↑glucose esp. diabetics
Levalbuterol (Xopenex HFA or Xopenex solution for nebulization) $50/month	HFA MDI (200 inh/unit) 45 mcg/inh Nebulizer solution: 0.31, 0.63, 1.25mg/3mL	2 inh q4-6h PRN 0.63 TID PRN; may ↑ to 1.25 mg TID PRN	≥4 yo: same as adult dose ≤ 4 yo: 0.31-1.25 mg q4-6hrs PRN 5-11 yo: 0.31-0.63 mg q8hrs PRN ≥12 yo: 0.63=1.25 mg q8hrs PRN	• Twice as potent as albuterol, similar side effect profile • Unclear clinical benefit to levalbuterol vs. racemic mixture of albuterol

b. ANTICHOLINERGICS

- NOT drug of choice for asthma exacerbations; may be used as an alternative bronchodilator for patients intolerant to SABA and in addition to SABA for patients experiencing beta-blocker induced bronchospasm.
- Inhibits muscarinic cholinergic receptors and reduces intrinsic vagal tone of the airway, leading to bronchodilation (not as effective as SABA)
- Side effects typical of anticholinergics (dry mouth, dry eyes if sprayed into eyes, caution in patients with glaucoma or prostate / bladder-related obstruction)
- Chronic use of ipratropium, but not tiotropium, (e.g., in COPD) associated with small increased risk of cardiovascular-related death in retrospective study. Unclear of impact on clinical use at this time.

Medication (brand name)	Availability	Adult Dose	Child Dose	Notes
Ipratropium bromide (Atrovent) $70/month	HFA MDI (200 inh/unit) 17 mcg/inh Nebulizer: 500 mcg/ 0.02% in 2.5mL	COPD: 2 inh TID-QID, taken not more often than q4h. Initial doses of 4 inh per dose may be required by some patients for maximum effect (max dose = 12 inh/day) COPD: 500 mcg TID-QID via nebulizer. Doses should be spaced 6-8 hrs apart. For urgent care: 500mcg q20 min x 3 doses, then PRN	No indication For urgent care: 250-500 mcg q 20 min x 3 doses, then PRN	• 90% of nebulized solutions enters the esophagus, resulting in more systemic ADRs vs. inhalation via MDI + spacer • Contraindicated in patients with a history of hypersensitivity to soya lecithin or related food products, such as soybean and peanut. • Ipratropium may be mixed with albuterol in the nebulizer if used within one hour of mixing
Tiotropium (Spiriva Handihaler) $100/month	DPI (30 caps/pkg) 18 mcg/cap	COPD: Inh contents of 1 capsule once daily	No indication	• Counseling point: **DO NOT SWALLOW CAPSULE** • Slower onset vs. ipratropium, aclidinium • Contains lactose
Aclidinium (Tudorza Pressair) $250/month	Breath-actuated DPI: 400 mcg/puff	COPD: 400 mcg inhaled once daily	No indication	• Reduced potential for systemic anticholinergic effects, low systemic bioavailability • Faster onset vs. tiotropium • Contains lactose
COMBINATION PRODUCTS				
Albuterol + Ipratropium (Combivent Respimat) $240/month	SMI (120 inh/unit) 100mcg A + 20 mcg I / inh (dose counter)	COPD: **ONE** inh q4-6h (max 6 inh/day) For urgent care: 2 inh q20min PRN up to 3 hours ****Different dosing than Combivent MDI****	For urgent care: 1-2 inh q20min PRN up to 3 hours	• Propellant-free, slower velocity and increased spray duration to increase lung deposition • Priming with 1 actuation required if not used in past 3 days. • Discard date is 3 months from the date the cartridge is inserted into the inhaler.
Albuterol + Ipratropium (DuoNeb) $40/month	Nebulizer solution 3mg A + 0.5mg I / 3mL	COPD: 1 vial via nebulizer q6h (max 6 nebs/day) For urgent care: 1 vial via nebulizer q20min x up to 3 doses, then PRN	For urgent care: ½ vial q20min x up to 3 doses, then PRN	• 90% of nebulized solutions enters the esophagus, resulting in more systemic ADRs

c. SYSTEMIC CORTICOSTEROIDS (CS)

- Although not short-acting, oral systemic CS are used for moderate and severe exacerbations as adjunct to SABAs to speed recovery and prevent recurrence of exacerbations
- Continue PO CS until PEF reaches 80% of personal best or symptoms resolve (usually 3-10 days). No need to taper.
- ADRs: Short-term- ↑ blood glucose, appetite, fluid retention, weight, BP; mood alteration; peptic ulcer; ↓ K+. Long-term- adrenal insufficiency, growth suppression in children, osteoporosis, cataract formation, glaucoma, dermal thinning

Medication (brand name)	Availability	Adult Dose	Child Dose	Notes
Prednisone	1, 2.5, 5, 10, 20 mg tabs 5mg/5mL syrup	40-60mg daily or ÷ BID x 3-10 D OR 7.5-60mg QAM or QOD x 3-10 D	1-2 mg/kg/day (max 60mg/day) x 3-10 D OR 0.2-2 mg/kg QAM or QOD x 3-10 D	Equivalent glucocorticoid dosages: Cortisone--25 mg Hydrocortisone--20 mg Prednisolone--5 mg Prednisone--5 mg Methylprednisolone--4 mg Triamcinolone--4 mg Dexamethasone--0.75 mg Betamethasone--0.6 mg
Methylprednisolone	2, 16 mg tabs	Any corticosteroid can be used when dosed equivalently to above. See equivalent dosing chart on right.		

APPENDIX B: Evaluation of Asthma SEVERITY (if NOT taking long-term control meds)

Initial Assessment of Asthma SEVERITY (For patients NOT taking long-term control medications)		Classification of Asthma SEVERITY, ≥ 12 yo			
		Intermittent	Persistent		
			Mild	Moderate	Severe
IMPAIRMENT Normal FEV1/FVC: 8-19 yo: 85% 20-39yo: 80% 40-59 yo: 75% 60-80 yo: 70%	Symptoms	≤ 2 days/wk	>2days/wk but not daily	Daily	Throughout the day
	Nighttime awakenings	≤ 2x/mo	3-4x/mo	>1x/wk but not nightly	Often 7x/wk
	SABA use for sx control (not EIB prevention)	≤ 2 days/wk	>2days/wk but not daily, & not more than 1x on any day	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung function (Spirometry)	Normal FEV1 b/w exacerbations FEV1 > 80% predicted FEV1/FVC normal – see chart	FEV1 > 80% predicted FEV1/FVC normal- see chart	FEV1 60-80% predicted FEV1/FVC ↓ 5%	FEV1 < 60% predicted FEV1/FVC ↓ >5%
RISK	Exacerbations requiring oral systemic corticosteroids	0-1/yr	≥ 2/yr		
		Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time for patients in any severity category. Frequency and severity may fluctuate over time for patients in any severity category. Relative annual risk of exacerbations may be related to FEV1.			

Recommended Step for Initiating Therapy	Step 1	Step 2	Step 3	Step 4 or 5
			Consider short course of oral systemic corticosteroids for all ages	
	In 2-6 weeks, evaluate level of asthma control that is achieved and adjust therapy accordingly.			

APPENDIX C: Evaluation of Asthma CONTROL (if already taking long-term control meds)

Components of CONTROL (Applies to patients TAKING long-term control meds)		Classification of Asthma CONTROL and Adjusting Therapy, ≥ 12 yo		
		Well Controlled	**Not Well Controlled**	**Very Poorly Controlled**
IMPAIRMENT	Symptoms	≤ 2 days/wk	>2days/wk	Throughout the day
	Nighttime awakenings	≤ 2x/mo	1-3x/wk	≥4x/wk
	Interference with normal activity	None	Some limitation	Extremely limited
	SABA use for sx control (not EIB prevention)	≤ 2 days/wk	>2days/wk	Several times per day
	FEV1 or peak flow	> 80% predicted / personal best	60-80% predicted / personal best	<60% predicted / personal best
	Validated ACT, >12 yo only	≥20	16-19	≤15
RISK	Exacerbations requiring oral systemic corticosteroids	0-1/yr	5yo – adult:: ≥2/yr	
		Consider severity and interval since last exacerbation		
	Progressive loss of lung function, 5yo – adult	Evaluation requires long-term follow-up care		
	Treatment-related adverse effects	Medication side-effects can vary in intensity from none to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall risk assessment.		
Recommended Action for Treatment		Maintain current step tx f/u Q1-6 months Consider step down if well-controlled x ≥ 3 months	Step up 1 step f/u in 2-6 weeks	Consider short course PO corticosteroid Step up 1-2 steps f/u in 2 weeks
			For side effects, consider alt tx options	

Appendix D: Stepwise Approach for Managing Asthma or Classification of Asthma Severity AFTER Asthma is Under Control

Use these rows to classify asthma severity AFTER asthma is under control, based on lowest level of tx required to maintain control	Intermittent	Persistent					
		Mild	Moderate		Severe		
	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	↑ Step up if needed (First, check adherence, inhaler technique, environmental control, and comorbid conditions such as rhinitis, GERD, COPD) ASSESS CONTROL Step down if possible (if asthma is well-controlled x ≥ 3 months) ↓
Influenza Vaccination Annually Pneumococcal 23-Valent Vaccination: Give once if ≥65 years of age with asthma and no previous vaccinations; Give if >19 and <65 years of age and no previous vaccination received, repeat when ≥65 years of age only if it has been ≥5 years since last pneumococcal vaccination							
≥ 12 yo	Preferred SABA PRN	Preferred Low-dose ICS Alternative cromolyn, LTRA, theophylline	Preferred Low-dose ICS + LABA OR Med-dose ICS Alternative Low-dose ICS + either antileukotriene or theophylline	Preferred Med-dose ICS + LABA Alternative Med-dose ICS + either antileukotriene or theophylline	Preferred High-dose ICS + LABA AND Consider omalizumab for patients who have allergies	Preferred High-dose ICS + LABA + PO corticosteroid AND Consider omalizumab for patients who have allergies	
Each step: Patient education, environmental control, and management of comorbidities Steps 2-4: Consider subcutaneous allergen immunotherapy for patients who have allergic asthma							
Quick-relief Medication for All Patients SABA PRN asthma sx's. Intensity of tx depends on severity of sx's (q 20 min x up to 3 tx's PRN). Short course of PO corticosteroids may be needed. Caution: increasing use of SABA or use > 2 days a week for sx relief (not EIB prevention) generally indicates inadequate control and need to step up tx.							

Appendix E: GOLD Spirometric Criteria for COPD Severity

GOLD Spirometric Criteria for COPD Severity		
Stage I Mild COPD	* FEV1/FVC < 0.7 * FEV1 ≥ 80% predicted	At this stage, the patient is probably unaware that lung function is starting to decline
Stage II Moderate COPD	* FEV1/FVC < 0.7 * 50% ≤ FEV1 < 80% predicted	Symptoms during this stage progress, with shortness of breath developing upon exertion.
Stage III Severe COPD	* FEV1/FVC < 0.7 * 30% ≤ FEV1 < 50% predicted	Shortness of breath becomes worse at this stage and COPD exacerbations are common.
Stage IV Very Severe COPD	* FEV1/FVC < 0.7 * FEV1 < 30% predicted or FEV1 < 50% predicted with chronic respiratory failure*	Quality of life at this stage is gravely impaired. COPD exacerbations can be life threatening. *Respiratory failure: arterial partial pressure of oxygen (PaO2) , 8.0 kPa (60 mm Hg) with or without arterial partial pressure of CO2 (PaCO2) . 6.7 kPa (50 mm Hg) while breathing air at sea level.