Clinical Case Discussions – Day #1

Case 1

A 33-year-old man presents for evaluation of his asthma.

He reports having had asthma since childhood, mostly treated by his pediatrician and then subsequently by his internist, but he is pleased now to get consultation from an asthma specialist. For the most part, he has felt that his asthma has been well controlled. He is faithful to use of his fluticasone/salmeterol inhaler (250/50) 1 inhalation twice daily and infrequently needs his albuterol inhaler for rescue therapy, perhaps once every other week. He last experienced a flare of his asthma about 1 year ago, when he (and everyone else in his family) had a flu-like illness. He received a 10-day course of prednisone and felt back to baseline after completing it.

He works as an insurance agent, part-time at home and 3-days per week in a modern office building. He has a dog (shih tzu) at home, the same dog that he has had for 10 years; and he does not find that it causes him any problems. He has mild seasonal rhinitis (each fall) but has good nasal airflow and a normal sense of smell and has never been told of nasal polyps. He describes himself as "non-athletic" (an "avid indoorsman"), but on weekends in good weather he is likely to go for a walk around a nearby pond (about ¾ mile) with his wife.

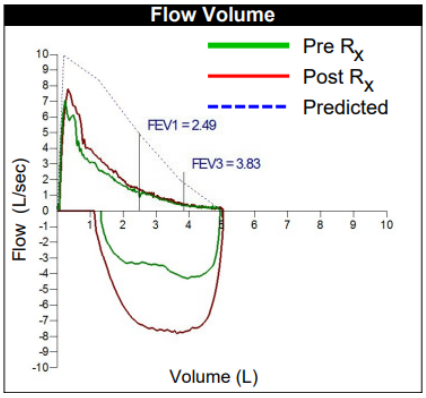
He has never smoked cigarettes. He vaped for a few years in his early twenties, none since. His family history is significant only for his mother's asthma and his father's heart attack at age 50.

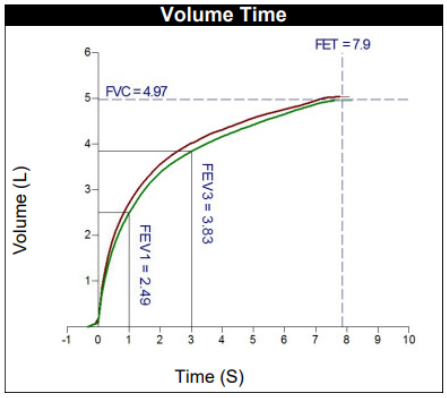
On examination, he appears well. His vital signs are within normal range, including his BMI and SpO2. Nares appear normal, without polyps. His chest is clear to percussion and auscultation, and the remainder of his examination is normal.

Spirometry is performed and the results appear below. He does not recall any prior breathing tests of this sort.

ATS compliant tests are indicated by a ✔ : FVC ✔ FRC DLCO Raw

Spirometry		Predicted Range Mean	Predicted Range 95%	Pre Bronchodilator Actual	Pre Bronchodilator % Pred	Post Bronchodilator Actual	Post Bronchodilator % Pred	Percent Change
FVC Effort Time		----	----	13:28	----	13:55	----	--
FEV_1	L	4.01	3.17	2.49	62	2.75	69	10
FVC	L	5.01	3.89	4.97	99	5.04	101	1
FEV_1 / FVC	%	80	72	50	62	55	69	10
FEV_6	L	4.95	4.05	4.65	94	4.76	96	2
FEV_1 / FEV_6	%	81	72	54	67	58	72	7
FEF_{25-75}	L/s	3.94	2.27	0.95	24	1.15	29	21
PEFR	L/s	9.93	7.61	7.69	77	8.17	82	6





Spirometer Calibration to ATS
By: Aaron Mullins
Same Day - 06:33 AM

Additional laboratory data:

FeNO – 25 ppb

Peripheral blood eos – 210 cells/uL

IgE – 110 IU/ml

Case 2

A 64-year-old man seeks your help with his difficult-to-control asthma.

He had the onset of asthma in his early 20s, but it wasn't until the last 10 years that it became "unmanageable." He has been treated by his local specialist with escalating therapies, most recently with the combination 3-in-1 dry powder inhaler (fluticasone furoate-vilanterol-umeclidinium) along with albuterol + budesonide combination inhaler for acute relief. He has needed multiple courses of oral steroids, such that now he keeps a supply of prednisone at home and self-initiates a short course when he "just can't breathe anymore." These exacerbations come sometimes with respiratory infections, sometimes with a change in the weather, and sometimes "just out of the blue." He has gained a considerable amount of weight (now 285 lbs, 5' 10" tall; BMI 41). His wife has started complaining of his loud snoring.

Last year he was started on dupilumab 300 mg every other week. It seemed to help for a few months, then stopped helping. His local physician switched him to tezepelumab 210 mg once monthly about 6 months ago, but he isn't sure that it has made any difference.

He reports occasional reflux symptoms "since gaining all this weight." He had sinus surgery ("to improve drainage") many years ago; he denies sensitivity to aspirin or NSAIDs. He is a lawyer, works in a clean office environment, and describes his home as "immaculate," without any pets or pests. When well, he likes to go to the gym, but in recent years he has not felt well enough to do so. His asthma is dominated by shortness of breath, with some cough and what he describes as "loud breathing" rather than wheezing. He is a lifelong non-smoker.

On examination today, he appears well. His vital signs, including respiratory rate, are normal. He has a small anterior nasal septal perforation. His chest is clear. He has mild moon facies, a dorsal "hump," abdominal striae, and atrophic skin with scattered ecchymoses.

His spirometry is within normal limits without significant change following bronchodilator. His FeNO is 14 ppb. His peripheral blood eosinophils are 80 cells/uL (and on review, had been as high as 480 cells/uL prior to initiation of biologics).

He wonders if trying another biologic agent might be helpful, or perhaps using 2 biologics at once.

Case 3

A 37-year-old woman with asthma is referred for evaluation of her hypereosinophilia.

She began having asthma symptoms about 1 year ago. At first she seemed to do well with a budesonide + formoterol inhaler used twice daily and as needed, but more recently she has been troubled by a nagging cough with small amounts of pale yellow sputum, wheezing particularly at night when trying to sleep, and shortness of breath on climbing more than 1 flight of stairs. She felt much better following a course of oral steroids, but vowed never to take that "devil's drug" again because of the side effects that she experienced (including moodiness and depression).

She lives in an old apartment building, with rugs only in the main room. She has had a parakeet for 2-3 years, no other pets. Her work is as a librarian in an old elementary school building. She was born in the Dominican Republic, emigrated to the U.S. with her parents when she was 12 years old, and returns home for a visit maybe once every other year.

She has had mild rhinitis for which she periodically uses a nasal spray; mild psoriasis on her elbows and knees and back; no history of pneumonia or heart disease.

Her examination is notable for erythematous and edematous nares, skin rash in the areas noted, and a few scattered expiratory wheezes.

Her spirometry reveals mild airflow obstruction with an FEV1 of 72% of predicted, with significant improvement following bronchodilator (to 82% of predicted). Her FeNO is 47 ppb.

Blood studies reveal a white blood cell count of 11,200 with 35% eosinophils.
Her serum IgE is 195 IU/ml.

Case 4

A 17-year-old girl comes accompanied by her parents for evaluation of asthma that is now interfering with her participation in sports.

Throughout high school she has run cross-country track. On cold days she might use her levalbuterol inhaler prior to running; on warmer days, she would not need it. Until this year her asthma never seemed to get in the way of her running. However, this fall she found that instead of getting better during training season, her "times" were getting worse, and she would experience wheezing and shortness of breath after 10-15 minutes of running, despite pre-medication with her bronchodilator inhaler. She could complete the race, but at a much slower speed than her usual.

Her primary care clinician had her begin twice-daily inhaled beclomethasone, first 40 mcg/puff strength, then 80 mcg/puff strength, but she has noted no difference. She expresses frustration, feels "angry with herself," with a sense of "letting down" her teammates and coach.

Her parents indicate that she had frequent bronchial infections as a young child, and like her older sister, was diagnosed with asthma around age 3-4 years. She has had mild seasonal rhinitis and conjunctivitis, particularly in the spring, managed with intermittent use of an antihistamine. For symptoms of esophageal reflux, she takes occasional famotidine. Her mother has well-controlled asthma; her older sister has had more troublesome disease, with multiple urgent care visits and courses of oral steroids, now doing well on monoclonal antibody therapy.

On examination, she is breathing comfortably at rest. She is of normal height and weight for her age. Her physical examination is entirely normal.

Spirometry performed in the office is normal (FEV1 = 98% of predicted).

Her mother asks whether you think that she too would benefit from a biologic agent.