

APPA's February Meeting Features TWO Doctors!!!!

Dr. Gerald W. Staton, Professor of Medicine at Emory Clinic was **APPA's** guest speaker for its February 7, 2009, meeting. This is the second presentation to **APPA** by Dr. Staton, who specializes in internal medicine and pulmonary disease. The title of his presentation was "Pulmonary Problems in Post-Polio Patients." He also specializes in weaning patients off of breathing machines.

Dr. Staton brought another physician with him, Dr. Steve Hadler, who is a good friend. Dr. Hadler has been associated with the CDC effort to eradicate polio in the world, having just returned from working in Beijing, China. Dr. Hadler was gracious in sharing his experiences and expertise after Dr. Staton spoke (See Dr. Steve Hadler page 9).

Dr. Gerald W. Staton Background Information

Citing that the first polio case observed in the United States was in 1875, Dr. Staton indicated that this and following cases of polio helped characterize the disease. Those who contacted the polio virus experienced an initial illness that produced subsequent problems of weakness in the patient. About 40% of the survivors developed some respiratory problems. However, 90% of those who experienced breathing problems during the early phase developed more serious subsequent breathing problems. After a latent period greater than 15 years, these polio survivors experienced a gradual (usual response) or an abrupt (rare response) onset of new weakness, muscle fatigue, atrophy, and generalized fatigue symptoms. These symptoms were found to be excluded from other causes for the same symptoms. The manifestations of these symptoms in the polio survivors were as follows:

<u>Symptom Description</u>	<u>% Polio Survivors Affected</u>
a. Generalized fatigue/tiredness/exhaustion/lack of energy	85
b. Joint pain	75
c. Muscle pain	75
d. Weakness in muscles previously weak	85
e. Weakness in muscles not previously weak	55
f. Atrophy	40
g. Cold intolerance	40

- h. Respiratory insufficiency 40
(87.5% of which had prior respiratory problems when initially ill with polio)
- i. Dysphasia (difficulty in swallowing) 30

In 1970 there were only 100 identified cases of polio in the U.S. This low number was attributed to the many years of using the vaccines available at that time. Those individuals are now in their later years of life (50-80).

Differential Diagnoses of Respiratory Problems in Polio Survivors

Dr. Staton discussed the various types of breathing problems. They included Asthma, COPD (Chronic Obstructive Pulmonary Disease-smokers), Bronchiectasis (due to prior pneumonias), Congestive Heart Failure, Pulmonary Hypertension, Interstitial Lung disease, Scoliosis (causing restriction of air passages to the lungs), Obesity (excessive weight gain), and other neurological problems (ALS, multiple sclerosis, myasthenia, and other neurologically related problems).

Respiratory Problems in Post-Polio Syndrome

Some of these problems are associated with mucous development at the bottom of the breathing tube or the lungs (Micro- and/or macro-atelectasis). Other problems include decreased lung and chest wall compliance (loss of elasticity in these areas), hypoventilation (increased blood carbon dioxide-[CO₂] levels), swallowing difficulties, poor cough, and poor secretion clearance. An inability to cough relates to breathing problems, as in having shortness of breath.

Respiratory Evaluation

A pulmonologist employs several approaches for identifying breathing problems. The first is to identify whether excess weight is a factor with this problem. Next, is the use of Chest X-Rays or, preferably, a CAT Scan to help identify related internal problems. Another approach is Pulmonary Function testing. With the patient blowing into a tube, the physician measures the rate of movement of air and total volume of air flowing in and out of the lungs. The total lung capacity is determined from this testing.

Another approach is the Arterial Blood Test. Using a syringe and needle, blood is withdrawn from the patient so that the actual CO₂ content in the blood can be determined. If a high level of CO₂ is found, there is definitely a breathing problem.

The next commonly used test procedure employed by pulmonary physicians is Walking or Night Time Pulse Oximetry. No further information regarding this testing was given. Maximum Inspiratory and Expiratory

Pressures testing is yet another test. This instrument measures the capacity of the lungs. Dr. Staton mentioned that normal levels are 90%; however, capacity levels below 90% are serious and levels below 80% are considered very serious. Learning the Expiration Force of the lungs provides more important information.

There is another test, the Sniff Test, that measures the strength of the many muscles used in breathing. Dr. Staton mentioned that the diaphragm, abdominal or stomach, chest, and other muscles are all involved in providing air to the body during various activities. The actual functioning of the diaphragm muscles is observed using X-Ray Fluoroscopy.

Treatments That Might be Needed For Respiratory Problems

The treatments for these conditions relates to overcoming Oxygen (O₂) deficiencies with exercise or with O₂ therapy. In the latter therapy, support of breathing at night using a nasal (CPAP) or face mask (BIPAP) to feed O₂ into the lungs is a way to help the patient. With Post-Polio patients, a minority of them may need to feed O₂ into the lungs via a tracheostomy. One member of the audience offered that the O₂ therapy is applied during the day just to give all the breathing muscles a needed rest. Using proper conditioning exercises, when possible, can also improve O₂ intake in the patient. More on this treatment is mentioned in the Questions and Answers section below.

Sleep Apnea is a common and a serious breathing disorder that requires medical attention for anyone having this breathing problem. With Sleep Apnea, weight gain is a contributing factor. This statement applies to Post-Polio patients too. Sleep Apnea tends to be worse for Post-Polio patients.

Finally, Dr. Staton said it is important to separate breathing problems from heart problems and treating the identified problem or both problems. For this testing Dr. Staton monitors respiration and heart functions at rest and during exercise modes. A bicycle apparatus is used that can be pedaled with the feet or with the hands to accommodate patient exercise limitations. This was discussed further in the Questions and Answers section below.

Other treatments available include Bronchodilators for Asthma or COPD, Speech therapy for swallowing problems, Incentive spirometry, Learning cough techniques, Chest physical therapy (percussion and postural drainage), and Feeding tube usage.

Other Treatments for Post-polio Patients

There is concern among those in the audience relating to coping with mucous buildup in the lungs. Dr. Staton indicated there are physical therapy

exercises that will help remove the mucous buildup from the chest. He recommended daily, simple exercises of taking deep breaths as a treatment. Also, BIPAP O2 therapy will help to clear lungs. Not smoking or being exposed to cigarette smoke is definitely a must. Getting an influenza vaccine shot each year is an important safeguard, as well as getting a pneumonia shot every 5 years. Finally, swallowing safe foods that will not get caught in the esophagus is important to not overly tax the body.

Dr. Staton stressed that if you suspect that you may have Sleep Apnea get it checked out immediately with a physician and properly treat it. He reported that there exist what are termed “deconditioning effects” pertaining to breathing problems. These deconditioning effects are the result of other health problems a patient may be experiencing that need to be address before any reconditioning treatments, such as exercise and other approaches, can be prescribed by the physician.

Questions and Answers

1. In swallowing food an **APPA** member reported the food stopping part way down the esophagus. Is this related to Post-Polio? Answer: It is important to get it evaluated but it could be related to a change in the tube diameter and be independent of Post-Polio.
2. An **APPA** member has a similar swallowing problem with taking a Barium pill and is having to deal with a lot of mucous. Answer: You need to get a swallowing test with a liquid contrast to look for any narrow spots that could stop the pill. Also, an X-Ray Fluoroscopy test can detect spine intrusions that may produce a narrow spot in the tube. Skeletal muscles were affected by the polio virus and so the esophagus could have been affected. This situation could be polio related but there could be other causes.
3. Can involvement of chest muscles affect swallowing? Answer: Yes.
4. Do Post-Polio patients need to be concerned with anesthesia during surgery? Answer: Yes. Specific procedures must be followed. It is important to talk to your Surgeon and Anesthetist to prepare them.
5. What is the difference between CPAP and BIPAP? Answer: CPAP provides a constant back pressure with the air flow. With BIPAP, the machine senses you taking a breath and helps in taking air into the lungs. It adds more support to exhaling. In essence, BIPAP is a form of an artificial respirator. If your CO2 levels are high during the day you should be using BIPAP therapy. But you must have a physician-monitored sleeping study too.

BIPAP also keeps acid reflux from annoying a patient.

6. Did the Sugar Cube vaccine have 1-3 virus strains? Answer: No way to know that for sure.

7. A member having an airway problem wants to know if it is polio related? Answer: A floppy airway above the voice box is skeletal muscle related and could be from being affected by polio. A floppy airway below the voice box is smooth muscle and not skeletal muscles, thus not affected by polio.

8. Do Post-Polio patients need to get the polio vaccine? Answer: Yes, even though there is a very low incident of polio in the U.S. If you are planning to travel to areas of the world where there is a high exposure to polio virus you must get the inoculation.

9. Do you always have to observe the patient with breathing problems while exercising? Answer: Yes, this is sometimes necessary.

10. How many people affected by polio get paralytic polio? Answer: 1 in a 100.

11. Will polio survivors that used an Iron Lung have swallowing problems? Answer: They may not have involvement of swallowing muscles.

12. Question: One **APPA** member has always had to deal with high blood pressure and inquired if it was polio related? Answer: Polio could affect the autonomic nervous system.

13. Question: What about breathing exercises? Answer: A good program of aerobic-type exercises is beneficial to our breathing process. Even ordinary daily deep breathing exercises while being seated are beneficial.

14. What can you do for an elevated CO₂ level versus O₂ levels? Answer: Excess O₂ will increase CO₂ levels. This counterintuitive response is not understood as being due to the patient's breathing ability but more as being a result of a chemical interaction taking place in the patient. This anomaly becomes an issue only if the patient is very sick. It never occurs in someone not sick. A blood gas test is used to measure these levels. Use of an O₂ flow rate of 1-3 liters/minute is a safe level. If higher flow rates get the concentration of O₂ in the blood up to 50-75% levels, then this is an issue.

Dr. Steve Hadler

This is a summary of Dr. Hadler's presentation.

Dr. Hadler became familiar with polio working for the CDC in Atlanta years

ago. At that time he was working solely on the prevention of contracting polio. Post-Polio Syndrome was not known then. With his background as an epidemiologist, he worked for the World Health Organization in the U.S., Pakistan, and China.

Regarding the statistic of only 100 cases of polio in 1970, 6-10 were caused by using the Sabin vaccine with the live virus. The risk of contracting polio using the Sabin vaccine was one in a million. Whether these 6-10 people have experienced Post-Polio Syndrome remains to be proven. One third of those people were exposed to the polio virus through changing baby diapers (the baby having recently received the Sabin vaccine and the adult involved having never been vaccinated). In 1996 the Salk vaccine was adopted as the proper vaccine to use. By 2000 the Salk vaccine (killed virus) was used exclusively. There has not been a case of polio in the U.S. since 2000. However, our immigrant population from several nations has been and will continue to be exposed until polio is eradicated from their native homelands.

In the 1980s the attempt to eradicate polio from this hemisphere was started. It involved an effort to search for sources of polio and to closely study cases. By 1991 there was only one case in Chile. Since then, there have been no cases reported from the wild polio virus in this hemisphere.

Polio was eradicated in China in 2005. However, some cases of live vaccine infections still exist.

Of the three types of polio virus, Type 1 is the most severe. Type 2 is the least common form of polio virus now. The remaining countries still experiencing polio outbreaks include India, Pakistan, Afghanistan and, Nigeria. A case of polio was reported in Indonesia and found to be from the Nigeria Polio virus strain. It is believed that the person contracted the virus strain. It is believed that the person contracted the virus during a Pilgrimage to Mecca for the Hajj. In Pakistan the effort has approached 25 million people for vaccine treatments. The next few years will either make or break the effort. This effort is being funded by Bill Gates, World Bank, and Rotary organizations.

Dr. Hadler pointed out that the Sabin oral vaccine will mutate back to a wild virus. On this basis, the eradication effort is now considering returning to using vaccines with individual virus strains. This consideration is necessary as they will be forced to stop all vaccines at the same time once eradication is achieved. The alternative is to switch the world-wide effort to only the Salk killed virus vaccine.

Summary written by Ron Swor, Ivy Stiles, and Cheryl Hollis.