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Hospitalist Update:

Treatment of Stable COPD: Recent Guidelines and Medication Update

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Chronic Obstructive Pulmonary Disease (COPD) is a preventable cause of morbidity and mortality that poses a significant public health burden. The disease is characterized by progressively worsening airflow limitation and chronic airway inflammation with hyperresponsiveness to noxious particles and gases. The airflow limitation seen in COPD is caused by disease of the small airways and parenchymal destruction (obstructive bronchiolitis and emphysema, respectively). The associated chronic inflammation can lead to structural changes with narrowing of the small airways, loss of lung elastic recoil, and diminished ability of the lungs to remain open during the expiratory phase. Previously used terminology to describe COPD may have failed to include the hallmark of the diagnosis, airflow limitation. The term emphysema refers to the destruction of gas exchanging surfaces of the lung, and is a pathological description of one characteristic of COPD. Another term, chronic bronchitis, defined as cough with sputum production for at least 3 months in each of 2 consecutive years, may be associated with normal spirometry.

Treatment options for COPD include both pharmacologic and non-pharmacologic varieties, typically added in a stepwise fashion with the goals of controlling symptoms, improving quality of life, and decreasing the frequency and severity of exacerbations. The goal of this review is to provide a guide for treatment of stable COPD, and has been taken from the most recent Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines, last updated in April of 2011.

Severity classifications set forth by the GOLD guidelines are often used to assist with guiding therapy. In stage I disease, short-acting bronchodilators alone are typically adequate, with long-acting beta agonists (LABA) and inhaled corticosteroids (ICS) typically being added in a stepwise fashion in stage II disease. Classification of disease severity by gold criteria is as follows:

Stage I	Mild COPD	FEV1/FVC<0.70	$FEV_1 \geq 80\%$ normal
Stage II	Moderate COPD	FEV1/FVC<0.70	FEV_1 50-79% normal
Stage III	Severe COPD	FEV1/FVC<0.70	FEV_1 30-49% normal
Stage IV	Very Severe COPD	FEV1/FVC<0.70	FEV_1 <30% normal, or <50% normal with chronic respiratory failure present

Smoking cessation

In patients who smoke, cessation can influence progression of disease greater than any other intervention. Long-term quit rates as high as 25% have been reported with effective use of resources. Pharmacologic interventions to assist with cessation include nicotine replacement as well as multiple other pharmacologic therapies. When compared to placebo, nicotine replacement products are more effective and increase long-term smoking abstinence rates. Contraindications to this form of therapy include unstable coronary artery disease, untreated peptic ulcer disease, recent MI, and recent stroke. Medications available to assist with cessation include Varenicline, bupropion, and nortriptyline, all of which have shown an increase in long-term quit rates compared to placebo. In addition, counseling by healthcare providers for as little as 3 minutes regarding need for cessation creates quit rates of 5-10%. When all available modalities for cessation are combined quit rates have been shown to increase to 35% at one year.

Pharmacologic Therapy for Stable COPD

Again, the goal of therapy is to reduce symptoms, reduce the frequency and severity of exacerbations, and improve quality of life. Commonly used medications in the treatment of stable COPD include beta 2 agonists, anti-cholinergics, and inhaled corticosteroids in combination with long-acting beta agonists. The choice of a medication regimen is typically tailored based on patient response to therapy and cost. None of the available medications have shown to improve the long-term decline in lung function seen in COPD. For a list of commonly used medications, see table 3.3 in the most recent edition of the GOLD guidelines.

Bronchodilators:

Bronchodilators increase the FEV1 by decreasing airway smooth muscle tone and can be given on an as-needed or scheduled basis. Effective bronchodilation results in improved emptying of the lungs, reduction in hyperinflation, and increased exercise tolerance. Medications included in this class include beta-2 agonists, anti-cholinergics, and methylxanthines. Commonly used short-acting bronchodilators include albuterol, levalbuterol, and ipratropium bromide. Single or combination therapy is acceptable, but combination therapy with a short-acting beta-2 agonist and anti-cholinergic provides greater and more sustained improvements in FEV_1 compared to either class alone.

Methylxanthines provide modest bronchodilation, but their use is limited by interactions with other medications and potential toxicity. Routine use of methyl-xanthines is not recommended unless

other bronchodilators are not available or are unaffordable for long-term treatment. Long acting beta agonists (LABA), such as formoterol and salmeterol, improve FEV_1, lung volumes, dyspnea, quality of life, and exacerbation rates. Duration of action is 12 hours or more, although a long-acting beta-agonist with duration of action lasting 24 hours, Indacaterol, has recently become available.

Tiotropium is a long-acting anti-cholinergic bronchodilator that has a duration of action > 24 hours. It has been shown to reduce exacerbations and related hospitalizations, improve symptoms, and also to improve the effectiveness of pulmonary rehabilitation.

Corticosteroids, Inhaled:

Inhaled corticosteroids (ICS) can improve symptoms, lung function, quality of life, and reduce the frequency of exacerbations if used regularly in patients with an FEV_1 < 60% predicted. ICS are recommended for patients with severe and very severe airflow limitation and for patients with frequent exacerbations that are not controlled by LABA. There is no effect on long-term decline in FEV_1 or mortality, but it should be noted that withdrawal from treatment with ICS may lead to exacerbations of COPD.

Combination therapy with ICS and LABA is more effective than either class alone, and has been shown to reduce exacerbations and improve lung function and health status in patients with moderate to very severe COPD. One large prospective clinical trial showed no statistically significant effect of combination therapy on mortality, but meta-analysis indicated that combination therapy may reduce mortality. Combination of ICS/LABA with tiotropium has not been well studied, but has been shown to improve lung function and quality of life, and may lead to a reduction in the number of exacerbations.

Corticosteroids, systemic:

The numerous side effects associated with long-term treatment with corticosteroids limit their use clinically. Of particular importance is steroid-induced myopathy, which can lead to weakness, decreased functional ability, and respiratory failure. Routine use is not recommended.

Phosphodiesterase-4 Inhibitors:

These reduce inflammation by inhibiting the breakdown of intracellular cyclic AMP. Roflumilast is a once daily oral medication of this class. It has no bronchodilator activity, but has been shown to improve FEV1 in patients treated with salmeterol or tiotropium. Roflumilast has been shown to reduce exacerbations that require corticosteroids by 15-20% in patients with chronic bronchitis, severe to very severe COPD, and a history of previous exacerbations. Use should be limited to this subset of patients.

Other Pharmacologic Treatments

Vaccines

The influenza vaccine can reduce serious illness and even death in COPD patients. Yearly vaccination is recommended. Pneumococcal vaccination is suggested for patients 65 years and older and ,

younger patients with comorbid conditions, and has also reduced the incidence of community-acquired pneumonia in COPD patients < 65 years of age with an FEV_1 < 40% predicted.

Alpha-1 Antitrypsin Augmentation Therapy

This therapy is reserved for young patients with severe hereditary alpha-1 antitrypsin deficiency and emphysema. Therapy is only available in select countries and is very expensive.

Antibiotics

Older studies have shown both continuous prophylactic antibiotics and antibiotic prophylaxis during winter months have no benefit in reducing the frequency of exacerbations. More recent studies have shown some beneficial effects of antibiotics on exacerbation rate, including a recent trial of daily azithromycin, but further studies are needed before this type of treatment can be recommended due to concern for antibiotic resistance. Hence at this time, antibiotics should be reserved for infection-induced exacerbations and other bacterial infections.

Mucolytic and Antioxidant Agents

Use of these agents has been investigated in multiple studies with differing results. The overall benefits are small, and routine use is not recommended.

Antitussives

Inhibition of cough in COPD is not recommended as this is an important protective mechanism for mucus clearance. Routine use of antitussives is not recommended.

Vasodilators

Pulmonary hypertension is believed to be associated with a worsened prognosis in COPD. While it would seem beneficial to reduce right ventricular afterload and improve oxygen delivery to the tissues, results of studies have been disappointing. Nitric oxide has been shown to worsen gas exchange by altering hypoxic vasoconstriction, creating increased blood flow to poorly ventilated lung units. This drug is contraindicated in stable COPD, and the use of endothelium-modulating agents as treatment for pulmonary hypertension in COPD patients is not recommended pending further studies.

Narcotics

In patients with very severe disease, dyspnea is effectively treated using oral or parenteral narcotics. Nebulized opiates may be effective, but definitive data is still lacking. Serious side effects can occur, and patients must be made aware of potential consequences of overuse.

Non-Pharmacologic Therapies

Pulmonary Rehabilitation:

Pulmonary rehabilitation focuses on problems that may not be addressed with normal medical management of COPD, including deconditioning, social isolation, depression, muscle wasting, and weight loss. Goals of pulmonary rehab include reducing symptoms, improving quality of life, and increasing physical and emotional participation in activities of daily life. Increases in peak workload, peak oxygen consumption, and endurance have been well documented as a result of pulmonary rehabilitation. The minimum duration of an effective program is six weeks, and the benefits continue to increase

with further increases in the duration of program. If a formal program is unavailable it is to advise graded increases in physical activity with a goal of 20 minutes per day. Most programs include exercise training, smoking cessation assistance, nutrition counseling, and education regarding COPD and medical therapy for the disease.

Other Treatments

Oxygen Therapy:

Administration of oxygen therapy for > 15 hours per day in patients with severe resting hypoxemia has been shown to increase their survival. Long-term oxygen therapy is indicated for those with:

- A PaO2 at or below 55 mmHg or SaO2 at or below 88% confirmed on two occasions over a three week period. This can be with or without hypercapnia.

(Or)

- A PaO2 between 55 and 60 mmHg, or SaO2 of 88% in the setting of pulmonary hypertension, peripheral edema suggesting congestive cardiac failure, or polycythemia (Hct > 55%).
-

Ventilatory Support:

Non-invasive ventilation (NIV) is being used more frequently in patients with stable, very severe COPD. There may be a survival benefit associated with NIV use, but quality of life remains unaffected. In those patients with both COPD and obstructive sleep apnea there are benefits in both survival and hospital admission rates with use of NIV.

Surgical Treatments

Multiple surgical interventions exist as potential treatment for very severe COPD, including Lung Volume Reduction Surgery, Bronchoscopic Lung Volume Reduction, Lung Transplantation, and Bullectomy. All carry significant operative and post-operative risks, and are typically associated with a higher health care cost when compared to medical management of COPD. Strict patient selection is required to optimize outcomes.

Summary

This review was intended to give general guidelines regarding medical management of stable COPD. The goal of therapy is to reduce symptoms, increase exercise tolerance, improve health status, reduce the frequency of exacerbations, prevent disease progression and reduce mortality. These goals should be reached with the fewest possible side effects from medications, which is often difficult given the number of comorbidities seen in COPD patients. The medications used for each particular patient are determined by patient response to therapy and cost of therapy. For full details, see the most recent set of GOLD guidelines, from which this material was obtained.

Useful References:

- *Global Initiative for Chronic Obstructive Lung Disease, Updated April 2011. www.goldcopd.org*
- *COPD: overview of definitions, epidemiology, and factors influencing its development. Rennard SI. Chest. 1998: 113 (4 Suppl): 235S*
- *Murray and Nadel's Textbook of Respiratory Medicine, 5th ed. Vol 3, Chapter39, pg 919-956.*

Copy and Paste by Any Other Name - Cloning, Carry-forward – is not a Rose!

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Introduction:
The copy and paste function in the electronic medical record (EMR) can turn into a thorn-in-the-side when ineffectively used by health care providers for documentation. Dimick identifies three words that start with "C" to mean the same thing - copy and paste – cloning – carrying forward.[1] Cloning can be defined in the following way; each note in a medical record is worded just like or similar to the previous entries for the same patient, or from one patient to another patient. This common practice can raise concerns about record credibility, plagiarism, and the risk of legal and monetary ramifications (i.e. malpractice, overbilling, and fraud). In addition, cloning can negatively impact on clinical decision making and make it difficult to find and prioritize current essential information about the patient. Based on both personal record and article reviews most providers do not intentionally use copy and paste to provide ineffective patient care or distort or falsify documentation; often though, the end result from use of this technique can be compromised patient care and the inability to meet an insurer's requirement for documentation of medical necessity. Some additional issues can include a(n):

- Increase in redundancy
- Increase in length of notes
- Increase in repetition of errors
- Increase in need to keep handwritten notes
- Decrease in record integrity
- Decrease in record effectiveness
- Loss of a meaningful orderly narrative
- Over-write of and by other providers

Background:
Hammond, et al at the American Medical Informatics Association (AMIA) Symposium Proceedings in 2003 indicated that cloning of patient documentation did not become a pervasive issue until the late 1990s with the introduction of the use of electronic medical records (EMR) and the copy and paste function from computer software.

In Thielke, Hammond, and Helbig's study of 1479 Veterans' Administration (VA) patients and 167,076 VA records using a specially designed software program to identify word sequences, they found greater than 90,000 instances of identical 40-word repetitions. They also found copying in three percent of all patient exams and 25% of all patient charts. They also created a risk categorization for this cloning that classified physical examinations, use of another authors notes, or duplication from more than six months previously to have the potential for the greatest risk. *Copying of physical exams were considered "highest risk" because this is a record of the writer's direct observations in a clinical encounter.*

Cloning Risk Classifications[3]

Code	Risk Description
1	Artifact, not misleading, no risk
2	Artifact, minimally misleading, minimal risk
3	Human, not misleading, no risk
4	Human, minimally misleading, minimal risk
5	Human, misleading, some risk
6	Human, clinically misleading, major risk

According to Hammond et al risks 5 and 6 are the most potentially dangerous for patient care. Risk 4 may have a significant impact on accurate coding and could result in either under coding or fraudulent over coding.[2]

There is also information from the study by Thielke et al that inpatient medical services demonstrated the greatest percentage of copying, in increasing frequency – from interns, followed by medical students, then residents, then attendings.[3] In addition, subspecialty medical services showed an exam copying rate between 5 and 10%; overall 1:4 electronic records had a physical exam copied and 1:7 electronic records had an exam copied from another author or from six months earlier or more.

In a self-administered survey by O'Donnell, Kaushal and Barron, attitudes by physicians indicated that 90% used copy and paste (cloning) and 70% used it most of the time. In evaluating these attitudes, 71% of respondents reported known inconsistencies and outdated information compared to notes not copied and pasted.[4] The majority of providers who both used and did not use CPF agreed that the documentation was more outdated, inconsistent, and it was more difficult to find essential information. They also reported disparity between identified benefits and liabilities of using cloning based on whether the employee was a health care provider or held billing or legal responsibility.

Robert Hirschtick, in an editorial in the *Piece of My Mind* section in the Journal of the American Medical Association, states that, *as physicians have become more adept with the time-saving features of EMR, their notes have been rendered incapable of conveying usable information by their bloated and obfuscated nature* (i.e. – increased length, decreased effectiveness).[5]

There is a concern that copy and paste does not meet "the medical necessity requirements" for coverage of Medicare services and that it could be considered a misrepresentation since each entry must be specific to the patient at the time of encounter. As of yet there is no formal policy regarding copy and paste from the Centers from Medicare and Medicaid Services (CMS).

from the Centers from Medicare and Medicaid Services (CMS). The 2011 Health and Human Services (HHS) Office of the Inspector General's 2011 Work Plan targets evaluation of EMR documentation for improper payments.[6] As of September 24, 2012, in a letter sent to chief executive officers of hospitals and academic medical centers from Kathleen Sebelius, Secretary for the U.S. Department of Health and Human Services, and Eric Holder, Attorney General for the U.S. Department of Justice, cloning was identified as a red flag for possible overbilling and fraud.[7] This means that patient documentation by providers will be subject to greater scrutiny with an increased risk of denial of services, and recoupment of payment. Other insurers are not far behind in responding to these concerns.

Discussion:

There are some very real benefits to the use of effective EMRs and their corresponding features. These can include improved legibility, better time conservation, ability for more real time entry, increased time for patient interaction, more comprehensive documentation with the capacity for improved billing, increased ability to capture data, increased ease of entry, increased ability to stay within mandated trainee work hours, and as a result of these improved clinical efficiency. Despite these benefits, most institutions that have the copy and paste function within their EMR have not implemented any governance to ensure that those functions are used appropriately. As stated previously, most providers do not purposefully use cloning for improper reasons (i.e. overbilling, compromised patient care); it is often the result of work flow and the nature and functionality of the electronic record. The critical issues raised are whether the documentation meets the requirements for medical necessity and more importantly meets the standards for quality patient care.

Some institutions such as Vanderbilt Medical Center in Nashville, Tennessee, and various Medicare Administrative Contractors (MACs) are developing methods to better govern the use of cloning.[6] This includes the development of policies and procedures for the use of copy and paste such as periodic random audits, policies of "if you sign it, you own it", and "do not document what you do not do", and an automatic pop-up when a physician uses copy and paste that attests to the accuracy of the documentation. As we move forward, some ideas to consider to help ensure that the standards for quality medical care and medical necessity are met include:

1. Require source attribution
2. Automate attending monitoring of trainee notes
3. Educate on appropriate versus inappropriate use of copy and paste – (i.e. appropriate use includes such things as demographics, medications, allergies, problems, correct author identification; inappropriate use includes such things as medical history and physical examination findings)
4. Conduct audits
5. Re-engineer functions in EMR for greater efficiency and better work flow
6. Create auto highlighting/italicizing of copied and pasted text
7. Collaborate with informatics designers to identify and create better methods to document
8. Use voice recognition documentation methods
9. Develop EHR tools that provide audit trails, alerts, protected access to entries by other providers
10. Promote use and accuracy of current problem lists
11. Minimize inserting data available in other places in the record
12. Realign incentives for appropriate documentation
13. Use structured notes with assigned responsibility for various components based on role on health care team
14. Develop institutional/departmental policies and procedures and a system of governance on appropriate use of electronic documentation and copy and paste function

For access to more information on copy and paste guidelines and CE certification please go to the following resource, The Legal Health Record: Copy and Paste Guidelines, Webinar, Nov 17, 2009, American Health Information Management Association.[8]

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What 's new in Nutrition?

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Nutrition is an integral part of the healing process. The role of nutrition in healing is often underappreciated and the service of dietician/ nutrition specialists underutilized. This brief review provides information about useful resources, intended to guide clinical evaluation and treatment of malnutrition. Even though the calorie and protein requirements, during illness are increased, appetite and dietary intake is often decreased. Malnutrition has been defined by American Society of Parenteral and Enteral Nutrition (ASPEN) and the Academy of Nutrition and Dietetics (AND)to aid early recognition and intervention in malnourished subjects.

Etiology based categorization of malnutrition is widely accepted. Such categorization aids evaluation of severity and allows appropriate intervention. It is now understood that timely interventions in hospitalized patients to improve nutritional status, or to prevent malnutrition, can improve outcomes and decrease healthcare costs.

Continued…..

It should be noted that current defining criteria for malnourishment do not include lab markers like albumin and prealbumin as levels of these acute phase reactants, do not correspond well with the nutritional status of the patient.

It is recommended that malnutrition be diagnosed if two or more of the following six characteristics are present.

1. Insufficient energy intake
2. Weight loss
3. Loss of muscle mass
4. Loss of subcutaneous fat
5. Fluid accumulation that may mask weight loss
6. Decreased functional status as measured by hand grip strength

The use of these characteristics to diagnose and evaluate severity of malnutrition has been discussed in great detail in the suggested readings.

Suggested readings:

- White, Jane V, Guenter, P, Jensen, GL, Malone,A, Schofield,M, the Academy Malnutrition Work Group, the A.S.P.E.N Malnutrition Task Force, and the A.S.P.E.N. board of Directors. JPEN J Parenter enteral Nutr. 2010;36(3): 275-283.
- Jensen GL, Mirtallo J, Compher C, et al. Adult starvation and disease-related malnutrition: a rational approach for etiology-based diagnosis in the clinical practice setting from the International consensus guideline Committee. JPEN J Parenter enteral Nutr. 2010;34:156-159.
- Fuhrman MP, Charney P, Mueller CM. Hepatic protein and nutrition assessment. J AM Diet Assoc. 2004;104:1258-1264.
- Rosenbaum K, Wang J, Pierson RN, Kotler DP. Time –dependent variation in weight and body composition in healthy adults. JPEN J Parenter Enteral Nutr. 2000;24:52-55.

CASE REPORT

Savory Satisfaction Can Lead to Lower Gastrointestinal Impaction

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Introduction:
The differential diagnosis for constipation is large and includes many common diagnoses as well as other unusual ones. Bezoars are one of the diagnostic "zebras" that we do not think of frequently. Bezoars are foreign material masses that are formed in the gastrointestinal tract following ingestion of indigestible substances. Bezoars can occur anywhere in the stomach, although they typically are found in either the stomach or the rectum. Bezoars can be made of many different substances , including hair (trichobezoar), medications (pharmacobezoars), milk (lactobezoar), and plant material (phytobezoar). We report a case of a young woman presenting with constipation who was found to have a sunflower seed bezoar.

Case Summary:
A 21 year old Caucasian woman presented initially to urgent care with a four day history of constipation and abdominal pain. The only recent change from her normal behavior was eating a large bag of un-husked sunflower seeds over a two week period of time. She had tried using laxatives and a Fleet Enema without symptomatic relief. Rectal examination revealed fecal impaction with sharp debris. Her laboratory findings were unremarkable. Abdominal x-ray noted the presence of stool in the colon. She was transferred to the inpatient setting and was given a trial with golytely and fleet enemas without success. Proctoscopy was then performed revealing a solid ball of sunflower seed husks in the rectum that was impassable even with the a colonoscope. Attempts at removal with roth nets, forceps, and other tools were unsuccessful. The patient was then taken to the operative theater for digital dis-empaction under sedation and partial removal was obtained. The remainder of the material was expunged by smog enema and additional golytely. The patient has made a full recovery.

Discussion:
In the United States, sunflower seed bezoars in adults are a rare finding. Our review of the literature, searching PubMed for sunflower seed bezoars and adults, showed less than 10 reported cases in the United States. Rectal bezoars in children have been more commonly reported.(1) There are many more case reports of rectal sunflower seed bezoars and other bird seed bezoars from other countries, particularly in Israel and from other countries in the middle East. The increased incidence in the Middle East is thought to be from differences in dietary preferences. One Israeli study examined the composition of 30 rectal phyto-bezoars over a 10 year period of time.(2) Twelve were composed of prickly pear seeds, 10 from watermelon seeds, four from sunflower seeds, one from popcorn kernels, and one from pomegranate seeds.

Seed bezoars almost always occur in the rectum and nearly always require digital dis-empaction under sedation whereas seedless fecal masses do not. (3) There have been several novel case reports of gastric seed bezoars that were successfully dissolved with Coca-Cola.(4 - 6) The consumption of seeds without prior removal of the husks should be accompanied by the awareness that large quantities may lead to impaction.

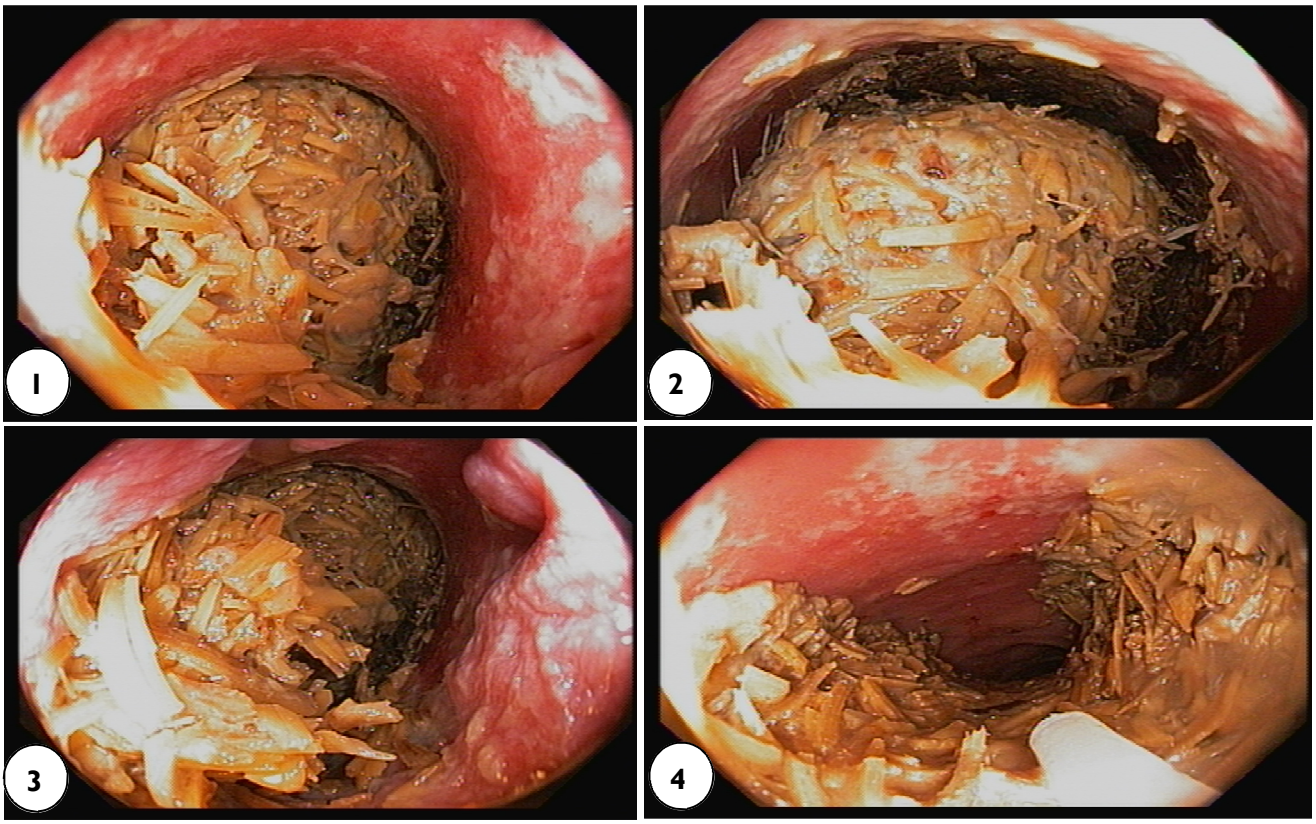

Figure1-4: Images of attempted bezoar removal with colonoscopy.

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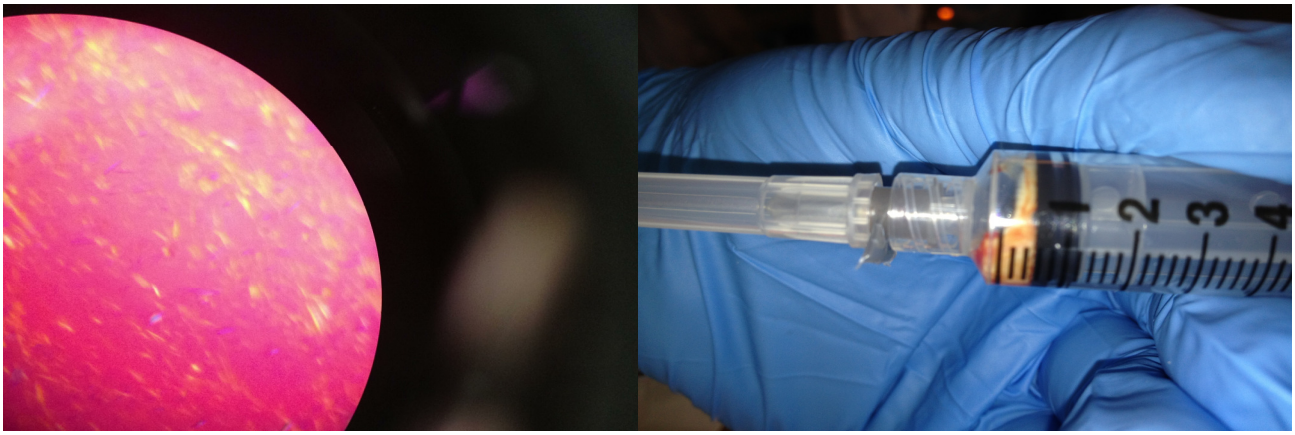
6. Rodicio JL, Bongera M, Abdel-Lah O, Hevia I, Alonso B, Herrero M, Martínez M, Vega Á, Ayala JM, Pozo F. Gastroduodenal phytobezoar treated with Coca-Cola®. Rev Esp Enferm Dig. 2012 Feb;104(2):101-2.

SPOT DIAGNOSIS

Question 1: A 52 year old lady with type 2 diabetes mellitus and recurrent acne noted to have these skin and nail changes during a clinic visit. She reports no weight loss and physical exam otherwise unremarkable. Her medications include metformin, oral calcium vitamin D supplements and another unknown medication for acne that was prescribed by an outside provider for many years. What is the your diagnosis and management plan ?

Answer: *Page 14*

Question 2: A 70 year old man presented with an acute onset of elbow pain and swelling. Aspiration of the olecranon bursa and microscopic images of the fluid are shown below. What is your diagnosis ?



Answer: *Page 14*

SPOT DIAGNOSIS

Answers:

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Linda A Headrick MD - *Professor, Internal Medicine, University of Missouri, Columbia, MO*

1. Minocycline induced slate gray hyperpigmentation of skin and nail bed. This patient was prescribed minocycline 100 mg twice daily for acne vulgaris and she was taking them for many years. Reported incidence ranges from 2%-15% in those consuming it and three types of minocycline related hyper-pigmentation have been described in literature. Type 1(most common) is characterized by blue black macules in areas of scarring/inflammation, type II consists of well circumscribed blue-grey pigmentation in previously normal skin commonly shins and forearm and type III (least common) with diffuse muddy brown pigmentation of the skin. Biopsy studies suggest that the pigment consisted of insoluble complexes of minocycline or a derivative chelated with iron with possible siderosis as the underlying pathology. Types II and III appear to be dose and duration related and treatment is to stop minocycline. But it is very uncommon for the discoloration to disappear. In this patient even after stopping minocycline for 6 months skin and nail discoloration persisted.

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2) Acute gout. The aspirate shows characteristic tophaceous material and microscopy reveals needle shaped negatively birefringent uric acid crystals.

ID Corner

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Management of prosthetic joint infections :

The IDSA has published it's long awaited guidelines for the management of prosthetic joint infections.

Osman DR et al. Diagnosis and management of prosthetic joint infection: Clinical practice guidelines by the Infectious Disease Society of America. Clin Infect Dis2013;56:e1-25. Available at idsociety.org, of this link-

http://www.idsociety.org/uploadedFiles/IDSA/Guidelines-Patient_Care/PDF_Library/IDSA%20PJI%20Guideline%20CID%2012%202012.pdf

MISSOURI HOSPITALIST SOCIETY

CONFERENCE CALENDER

- **115th Missouri Osteopathic Annual Convention:** April 24 - 28, 2013 Lake of the Ozarks
- **Annual Dialysis Conference 2013:** March 10-12, 2013 Seattle, Washington
- **Family Medicine Update:** April 19-20, 2013 Columbia, MO
- **Fundamental of Critical Care Support :** Feb 15th-16th Kansas City, MO
- **First Liver Symposium:** March 16, 2013 Columbia, MO

Front page photo: Courtesy of Mohammed Ahmed MD from Division of Rheumatology and Immunology

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Archive link:
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