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Abstract

Implications of medical nonadherence are far reaching and impact all facets of the health care system. Consequences of nonadherence affect features of financial burden, psychological burden, psychosocial disadvantage, and physical detriment. Patient, provider, and cost should be considered during the development and execution of medical planning on the individual patient level as well as on the grand-scale healthcare performance level. This article is a review of available literature pertaining to initiating improvement aimed at *provider dependent* barriers to patient adherence. Through gaining an understanding of how a provider could negatively influence the adherence of a patient to a prescribed plan, corrective measures can be taken to improve the healthcare delivery system on a multifaceted plane and prevent this obstacle to patient care resulting in improvement of patient outcomes, patient satisfaction, and decreased provider burnout.

Keywords: Compliance, adherence, noncompliance, nonadherence, patient satisfaction, outcome-based, provider-patient interaction, provider satisfaction, primary care, provider-patient relationship, communication barrier, attitude of health

"Was it Something I Said?" Patient Adherence and Outcomes Improvement Through Enhancement of the Patient-Provider Interaction

To first do no harm is the principle of nonmaleficence, this is one of the first ethical concepts covered during healthcare provider training and what a provider is programmed to strive for everyday of his or her career. Providers endeavor to cure when able, treat with efficacy, and provide comfort where possible; providers are also taught the concept of empathy and active listening. Somewhere in the shuffle of conversion of student to practitioner, the reality and constraints of time and productivity create the communication and relationship barriers to care. Administrative burden and electronic medical records replace face-to-face patient-centric interaction time. Provider-patient relationships suffer as providers finish the patient's sentence, assume to know what the patient is thinking, and use "clinical judgement" or "previous experiences" to fill in communication gaps during an office visit. The deterioration of this relationship leads to miscommunication, a lack of empathy and trust, and results in poor patient outcomes as well as provider dissatisfaction and burnout.

Patient adherence has been a topic of great importance, there have been studies, councils, books, training manuals, and think-tank groups created all tasked with a seemingly simple, but scrupulously complex, goal of improving patient adherence. In what is considered modern medicine Robert Kosch was quoted to refer disdaining to the nonadherent tuberculosis patients as "vicious consumptives, careless and/or irresponsible" (Vrijens, et al., 2012). There has even been quotes as early as 400 bc; Hippocrates noted that patients "do not take prescribed medications" and then later "complain" that the

treatment did not work. In 2007, the National Council on Patient Information and Education (NCPIE) declared that medication nonadherence is "America's other drug problem."

The complex nature of medical adherence includes many factors which are not under the influence, nor control, of the provider. These patient driven issues are discussed at length in the available research and include many proposals for corrective measures; but, will not be discussed at any length for the purpose of this article. There has become an apparent correlation between the patient's nonadherence and provider's self-described emotional exhaustion, depersonalization, and diminished perception of personal accomplishment. Following the theological teachings of Karl Paul Reinhold Niebuhr would benefit providers regarding patient adherence on the influence a provider's well-being; providers must accept the things (they) cannot change, have the courage to change the things (they) can, and the wisdom to know the difference.

Providers are unable to affect patient-specific factors influencing adherence, so focusing on correcting the patient-provider relationship, delivery of care, communication skills, and optimization of face-to-face time available with patients will allow for provider-driven modification of adherence where possible. This could significantly lead to increased provider and patient satisfaction and healthcare outcomes.

Methods and Results of Data Collection

Since the days of Hippocrates, a struggle to "make a patient cooperate" has been documented; over the past, nearly, 2500 years, it does not seem, as a system, we have made great headway to correcting the problem. There are numerous high-quality articles, book

chapters, and publications from reputable and respected sources available to discuss the very broad topic of medical adherence. According to Vrijens et al. (2012), research articles have dated back as early as 1961; a recent literature review shows articles are as recent as 2018, including abstracts proposing future studies.

A Research Question was generated: How can patient compliance, or, treatment plan adherence, be improved by improving the interaction, or perceived interaction, of a patient with their healthcare provider and what benefit can this have?

The Search was Conducted through several search engines. A review of many articles, book chapters, and other resources including google, google scholar, pubmed, EBSCO, LC OneSearch, as well as the search feature in specific journal articles (like JAMA).

Exclusions were made as specific articles pertaining to provider-driven causes of nonadherence are not as readily available as patient compliance in general. Articles which solely focused on patient-centered compliance adherence efforts were omitted. Many articles were excluded for specificity of disease state or specialty. Search terms and phrases were chosen to guide to area of interest including "financial impact of medical noncompliance" or "consequences of noncompliance" or "physician burnout, causes, patient cause." An initial search of "medical noncompliance" in pubmed resulted in 100,000 articles. Medical Subject Heading (MeSH) were used to further narrow the search.

Assumptions were made for the research. Reviewed literature will span from the earliest available evidence to the most recent evidence to compare the progress which has been made over the years. Assumptions are made that articles pertaining to physician

providers hold true information which can be extrapolated out to non-physician providers and will therefore be considered interchangeable.

Limitations of currently available articles specifically addressing the effect of the patient-provider relationship on the consequence of patient adherence are lacking. The effect of patient adherence on the wellbeing of the provider requires further exploration. The utility of improvement in the association of adherence, well-being, and systemic outcomes needs to be correlated.

Discussion

Nature of the Problem

As evident by the quote from Hippocrates, "keep a watch also upon the faults of the patients, which also make them lie about the taking of things prescribed," the problem of treatment plan nonadherence has been present since the beginning of medicine. There is only an estimated 50% adherence to medication for chronic illness in the United States (Brown, M. T., & Bussell, J. K., 2011). The cost of medical noncompliance is beyond financial, the reasons for noncompliance are innumerable, fortunately, decreasing the provider influenced barriers is tangible.

The history of research on medical treatment adherence is fairly extensive. Even the terms compliance and adherence have been shown to exaggerate the provider's control over the process of taking medications (Brown & Bussell, 2011). Compliance, adherence, persistence, and concordance are all terms which have been developed to describe the patient's relationship to their prescribed treatment plan (Vrijens et al., 2012). In 1997, the American Heart Association issued a statement in which adherence was defined as a behavioral process, strongly influenced by the environment in which the patient lives,

including healthcare practices and systems. The statement contained the assumption that satisfactory adherence depends on the patients having the knowledge, motivation, skills and resources required to follow the recommendations of a healthcare professional (Vrijens et al., 2012).

The very term "compliance" has a negative connotation which has been adjusted and corrected over time in the literature. Although most articles will still use the term compliance, the concept of adherence has been developed. Compliance has been viewed to show patients as "subservient" to a prescriber. Concordance was introduced to describe the patient-prescriber relationship. The shift from compliance to adherence was thought to evoke the idea of cooperation between the prescriber and the patient and less of a tone of obedience- or lack of- from the paternalistic principles of the prescriber (Vrijens et al., 2012). The shift in language reflects the constitutional shift in the ideation and understanding of the patient provider relationship and including the patient's perspective on their treatment approach.

Measurement of patients' adherence to the medical plan can be achieved through various techniques. Many of the measurements are based on surveys; this makes the validity of those studies and the extrapolation of the data questionable, as a limitation for those studies includes the concept that if a patient is nonadherent or does not understand or believe in the importance of the medical treatment plan, where is the hope that this individual will understand the importance of consistent and truthful answers during a survey.

Types of compliance measures include subjective, objective, and quantitative-biochemical studies (Brown & Bussell, 2011). This foundation was presented to separate

initiation, implementation, and discontinuation as different entities of adherence-related sciences with the hopes of allowing more fine tuning the research on medication nonadherence and allowing for further studies to look for distinct causation and interpretation focusing on promoting consistency and resolving the issues (Vrijens et al., 2012).

Categorization of adherence occurs based on where the patient diverted from their treatment plan. Initiation is primary nonadherence, the patient starts with not having the prescription filled in the first place; the next step, or implementation, involves the patient taking an incorrect dose at the incorrect time or forgetting doses; the final concept of discontinuation is simply stopping therapy before the recommended time (Frost & Sullivan, 2005). The concept of persistence as a separate entity of compliance is somewhere between initiation and discontinuation after the implementation was already successful (Katarzyna Krot & João Pedro Sousa, 2017) Rational nonadherence, which is the cessation of a prescribed treatment because of concern for or the presence of medication side effects, (Brown & Bussell, 2011), is another topic which some describe as not a "true" nonadherence because it was at least a partially informed decision on the patient's part and will sometimes be considered as a unilateral decision not agreed upon by both parties.

Consequences of Nonadherence

Financial burden of nonadherence can be as high as $100 Billion in direct annual charges to the, very fragile and over-extended, US healthcare system; there is easily $1.5 billion lost through missed wages and $50 billion due to loss of productivity (Frost & Sullivan, 2005). Pharmaceutical manufacturers lose potential revenue of billions of dollars, pharmacies are estimated to lose nearly $8 billion yearly from non-refilled prescriptions

(Frost & Sullivan, 2005). As discussed by C. Everett Koop, former US Surgeon General (1985), drugs don't work in patients who don't take them. Pharmacoeconomics estimate that approximate hospital cost per year for medical noncompliance is $100 billion as well as $564 billion annual cost suffered globally by pharmaceutical groups ($188 billion in US alone) (Klobusicky, J. J., Aryasomayajula, A., & Marko, N., 2015). Watson Wyatt worldwide performed a market analysis and found that the increase in financial strain caused by medication nonadherence has had a direct financial consequence to private, corporate-insured employees though a 20-25 percent increase in healthcare premiums (Frost & Sullivan, 2005).

Direct patient significance from a lack of adherence to a prescribed plan of care, including medication, dietary, and lifestyle changes has an impact on that person's quality and quantity of life. Not only can there be preventable, unnecessary progression of one or more disease states, complications resulting in decreased functional capacities, and premature death may also occur. Nonadherence can lead patients to become frustrated with healthcare providers and medication treatment plans as they are not working, the patient has repeated visits, and feels a sense of failure due to treatment outcome failure. Specific diseases have predetermined sets of consequences to the patient's wellbeing. Untreated hypertension leads to significantly increased risk of MI, stroke, and hospitalizations (Brown & Bussell, 2011). Uncontrolled diabetes can lead to diabetic neuropathy, nephropathy, strokes, heart attacks, poor circulation, and vision problems (Katarzyna Krot & João Pedro Sousa, 2017).

Provider implications are not as renowned as patient factors. Patients have challenging health needs and nonadherence influences the physician's ability to address

those needs; this can strain wellbeing for both patient and physician and contribute to provider burnout. Although the complex nature of medical adherence includes many factors, one of the key aspects of the provider-driven cause of nonadherence was the distrustfulness of the patient personally toward that provider (Krot, K., & Sousa, J. P., 2017). Physician burnout is quoted to be higher than the general population with 54% affected, indicating higher numbers of depressive symptoms and suicide risk (Dobler Claudia, West Colin, & Montori Victor, 2017). Nonadherence can lead to exhaustion on the part of the provider who is becoming frustrated with the patient and medications.

Recommendations for Improvement

There is a great deal of room for improvement across all-cause barriers to care. Provider initiation remediation will place some degree of control back in the hands of healthcare providers.

Improvement in the patient-provider relationship through improvement in patient-provider communication and trust building with the hope of ensuring a relationship that will create an opportunity for patient comprehension and willingness to participate and even lead the discussion on his or her health and to flourish from a medical standpoint. There are a multitude of ways that providers can foster the free and willing, even happy provider-patient relationship in which patients are more likely to be adherent to appropriate medical treatment plans. The use of *Leventhal's self-regulatory model of illness* shows that patients have ideas and action plans of their own related to their disease (Theunissen, de Ridder, Bensing, & Rutten, 2003). Shared decision making between the provider and the patient is associated with positive outcomes, such as enhanced adherence, improved illness-

related knowledge, and health behavior. This type of involvement is optimal for both the patient and the doctor (Katarzyna Krot & João Pedro Sousa, 2017).

Trust is defined as the acceptance of dependence and belief that the doctor will ensure the provision of medical service with the patient's interest in mind (Katarzyna Krot & João Pedro Sousa, 2017). Behavior of patients depends on the level of trust in their provider's integrity and honor and their perception of the provider's benevolence, along with the relational trust which was built up out of the character of that therapeutic provider-patient relationship (Katarzyna Krot & João Pedro Sousa, 2017). The failure to recognize nonadherence and resultant prescribing of more complex drug regimens is considered a provider related causative factor and open communication about barriers to plan adherence can improve this detrimental spiral.

Social and emotional support provided by the provider was enough to encourage the improvement to the provider's perception of wellbeing as they sought to provide a meaningful positive impact. Shared decision-making collaborative communication is associated with positive emotion of both provider and patient. Engagement will be meaningful (Dobler Claudia, West Colin, & Montori Victor, 2017). Simply increasing levels of patient perceived satisfaction with the visit can deter nonadherence (Vrijens et al., 2012).

Improvement of the healthcare system could include the improvement in the in-office level of education. Clinical encounters viewed as meaningful have potentially positive impact on provider wellbeing, enhance patient-provider interactions, and in turn increase patient adherence (Dobler CC, West CP, Montori VM., 2017). This could be achieved through mitigation of clerical burden through delegation of various tasks allowing

for increased time spent face to face with a patient and the family. Incorporation of nursing for explanation of benefits and adverse effects of medication effectively, and discussion about the financial and time-consuming burden that the treatment could place on the patient would allow the patient to fully participate in informed decision making mitigating or accepting complications of the progressive disease process from adherence failures (Brown & Bussell, 2011).

Utilization of an in-office educator would allow for easing the fear of side effects by simply stating what common and uncommon side effects would be expected and what the patient should do in the event this side effect occurs. By admitting that the costs of medications are prohibitive shows an empathetic relatable provider and knowing a few avenues, such as the variety of programs and rebates and medication savings plans can help offset that concern (Frost & Sullivan, 2005) (Brown & Bussell, 2011). Employing Facebook and Twitter for a social media outreach can help educate patients in the community who are unable to be reached by customary educational attempts, this can include the utilization of videos for explanatory educational topics (Klobusicky, Aryasomayajula, & Marko, 2015). Improvement in the education of providers would also increase the healthcare systemic responsibility for patient adherence. Providers are taught the treatment options, but not how to integrate a patient's needs and wants into that treatment plan.

Provider understanding and recognition of patient-centered factors for adherence impedance could greatly open the communication and relationship building with patients. Patient-related factors can include educational, financial, personal, or motivational barriers. One key concept from the patient factor category, medical literacy, is often

unrecognized and not addressed in the office by most healthcare providers; 77 million adults have basic or below basic health literacy, 26.4M have proficient health literacy; medicare patients with low literacy cost 4X more than a patient with proficient medical literacy (Brown & Bussell, 2011). Communicating at a level a patient cannot understand is detrimental to the relationship and trust of a patient. Complicated plans can be scaled down with programs aimed to simplify dose and delivery including local pharmacies which provide "pill box filling" services or "blister pack" compliance packaging (Frost & Sullivan, 2005).

Summary

The burden of noncompliance is significant across many areas of healthcare. There are financial, physiological, and psychological consequences because of medical plan nonadherence to patients, providers, and the healthcare industry as a whole.

For the patient, improvement in the patient-provider face-to-face interaction quality and quantity, there would be a decrease in misunderstanding. Patients would be more comfortable asking providers questions without fear of offending the provider or being judged. The patients could see a substantial decrease of morbidity, mortality, and disease sequelae; this could lead to a more productive and enjoyable life.

For the healthcare system, improvement in adherence results in improvement of spending. Patients who lack adherence have been estimated to cost $100 Billion in direct annual costs to the US health care system, $1.5 billion annually in lost patient earnings and $50 billion in lost productivity (Frost & Sullivan, 2005) as well as account for over 125,000 deaths in America per year (Brown, M. T., & Bussell, J. K., 2011).

For the providers, key concepts have been identified and classified, those have further been stratified. Providers have a deep intrinsic desire to provide optimal care for patients despite suboptimal work environments, increased clerical burden, and decreased work-life balance (Bohman, et al., 2017). Improvement of the patient -provider relationship will decrease in-office negativity enhancing the experience for both the provider and the patient. A reduction of the provider's self-described emotional exhaustion, depersonalization, and diminished perception of personal accomplishment will therefore decrease the burnout level experienced in this field. The economic costs of burnout specifically have been estimated between $500,000 and $1 million just on the burden of replacing an existing physician, then there are the further costs on top of this (Rosenfeld 2018).

There is still more research which is needed to show the patient-provider interaction-specific details which will optimize healthcare delivery and patient adherence and its effects on morbidity and mortality of disease, decrease of financial burden to the healthcare economy, and improvement in both patient and provider satisfaction. Addressing the concerns caused by treatment plan nonadherence, understanding the multifaceted and extremely complex nature of this complication of healthcare has become a mainstay of research over the past forty years at least and will be continued for the foreseeable future.

Conclusion

The recognition of complexity avoids blaming the patient and assists in identifying effective solutions (Brown & Bussell, 2011). The benefits which could be achieved from having a more detailed and organized method of delivering healthcare with the sole purpose of eliciting higher level of patient adherence could be far reaching. Appropriate goals for

improvement include increased availability of the provider time to improve interactions through mitigation of administrative burden, providing adequate staffing for delegation of coordination of care and education, and increasing clinical interaction and decision-making (Bohman, et al., 2017).

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Appendix A- Journal Guidelines

Submission to the open access journal through the department of Patient Preference and Adherence offered through Dove Medical Press:

Author guidelines:

- Scholarly project- professional writing assignment- consistent with a "Review" submission
- Fee of $2,310.00 (for a U.S. author)
- Prepared in English
- Follow APA guidelines (including references)
- Double spaced
- 3cm margins
- Clear concise language- unspecified word count (Reviews: 3000 to 7,500 words).
- General construction of Introduction, Methods, Results, Discussion, Conclusion, Reference page(s), and appendices.
    - Appendices to include any table, figures, charts, acknowledgement for committee, and denouncing sources of funding or competing interests

Dove Press. (2018, January 22). Manuscript organization | Dove Press Author guidelines. Retrieved June 20, 2018, from https://www.dovepress.com/author_guidelines.php?content_id=3510

Appendix B- Committee

Lindsay Young, CRNP	Primary Care Nurse Practitioner Choptank Community Health Federalsburg, MD LAYoung@choptankhealth.org
Tania Jenkins, CRNP	Urgent Care and Pediatric Nurse Practitioner Your Docs In and Gateway Pediatrics Salisbury, MD taniajks@gmail.com
Julie Steiner, MA	AP High School English Teacher Philadelphia School District, PA jksteiner@philasd.org
Gail Koskela, BA	High School Agriculture Teacher Philadelphia School District, PA grkoskela@philasd.org

Appendix C- Employment Position

I denounce any conflict of interest or funding sources for this submission.
I work in primary care at a federally qualified medical home in rural Eastern Shore Maryland.

Appendix D- Review

Peer Review: The peer review which was completed on behalf of my article included 1 section which was graded as "*needs improvement*"

Usefulness: The paper addresses as appropriate the PA competencies of medical knowledge, interpersonal and communication skills, patient care, professionalism, practice-based learning and improvement, and systems-based practice.

Consider if the paper is of practical value to PAs. It provides them with clinical pearls that will help them practice better medicine, or it can help them study for the recertification exam, or it updates them on a significant advance in medicine.

Rating: Needs improvement

Comments: The paper provides insight in to practical practices to improve care. This paper is a great review of literature. The author provides recommendations to improving education and adherence, however, on page 10, first paragraph, line 7. Caution should be taken with recommendation for social media use for education due to privacy issues and unintentionally promoting healthcare through unreliable sources on the internet.

Response: I disagree with the opinion of the reviewer. I have quoted sources who believe that the use of social media could help providers reach a more expansive audience. While it is true that the internet is full of "fake news" I believe that having a reliable source to turn to (ie. Your primary care office's webpage) to read articles which have been vetted by the primary care team would be beneficial for patients. Also, putting up Facebook or Twitters that remind patients about Flu Season, flu vaccinations, and providing general information with healthy tips like diabetic dietary recipes would not cause any privacy issues.

Appendix D cont.- Review

Manuscript Evaluation Form: Adopted from JAAPA Peer-Review Form For Educational Use Only

Manuscript title: Was it Something I Said?" Patient Adherence and Outcomes Improvement Through Enhancement of the Patient-Provider Interaction **Colleague Author:**

Peer reviewer's name: Don Williams

Tips and Resources for Peer Reviewers:

1. Before completing your review, please refer to the author guidelines included as an appendix within the assigned manuscript.
2. The course directors also recommend the following resource as another valuable tool and refresher for novice and experienced reviewers: Lovejoy, T., Revenson, T., Frances, R. (2011). Reviewing Manuscripts for Peer-Review Journals: A Primer for Novice and Seasoned Reviewers. Annals of Behavioral Medicine, 42: 1-13. This article is posted within the PA 961963 Moodle Course.
3. When you prepare comments to share with the author and/or editor, please use line numbers (when applicable) to relate any specific changes or concerns. If line numbers are not present, please reference page number and paragraph (i.e. Page 1, paragraph 2: the author is unclear about safety issues of the drug described here).
4. Please ensure that your comments are honest, specific, fair, constructive, and professional.

Peer Reviewer Expertise:

Which of the following best describes your level of knowledge of the manuscript's topic?

- o Expert o Competent
- o Familiar
- o No knowledge

Comments related to your level of knowledge: I would not consider myself an expert in the area of the authors topic, but say I am competent. I have been a leader in the medical field for decades, attended numerous classes on patient centered care and communication. My experience comes from action, proven through awards for patient care and improvement

Appendix D cont.- Review

based on getting patient's to adhere to recommended formal plans of care.

Manuscript Rating Worksheet – Rate the quality of the manuscript (excellent, satisfactory, needs improvement, unacceptable) regarding each of the criteria elements below and support each rating with comments and specific examples regarding strengths or areas in need of revision/improvement. Note the comments area will expand as you type to allow adequate space for constructive, professional critique.

Practicality: The topic is appropriate for publication in the target journal identified by the author.

Rating: Excellent

Comments: There is no question that no form of care can be effective without patient adherence. The importance of achieving that goal is through provider-patient communication. This subject is of interest to everyone involved in taking care of patients and to the patients in understanding the importance of being honest and building trust with their providers.

Quality of sources: The paper demonstrates command of the literature on the subject. Important, credible sources are included. References are current and include the most significant new studies from peer-reviewed journals. Primary sources are cited whenever possible. Heavy or inappropriate reliance on textbooks and generic websites is avoided.

A trick for efficient peer reviewing includes initial fact-checking. Randomly pick five statements in the article and check the accuracy against published content or another authoritative source. If multiple inaccuracies are present, note multiple inaccuracies exist and recommend the manuscript be rejected.

Rating: Satisfactory

Comments: The literature obtained revealed cross referencing material sometimes making it difficult to extract what part the author wanted the reader to understand. Example the Reference (Boham, 2017) speaks more to physician control and burnout, rather than adherence of patients to recommended care, although both should be considered in authors teaching.

Appendix D cont.- Review

Accuracy: The paper presents information that is up-to-date, accurate, and evidence-based. *The most recent literature is cited, and the manuscript critically appraises the cited works in a way that supports the reader's application of the material to patient care.*

Rating: Satisfactory

Comments: The author cited several articles with varying views providing open minded insight and inducing critical thinking. Example page 5, first paragraph. The author defines by comparison compliance and adherence, by doing this the reader can apply a clear perspective of intended message.

Usefulness: The paper addresses as appropriate the PA competencies of medical knowledge, interpersonal and communication skills, patient care, professionalism, practice-based learning and improvement, and systems-based practice.

Consider if the paper is of practical value to PAs. It provides them with clinical pearls that will help them practice better medicine, or it can help them study for the recertification exam, or it updates them on a significant advance in medicine.

Rating: Needs improvement

Comments: The paper provides insight in to practical practices to improve care. This paper is a great review of literature. The author provides recommendations to improving education and adherence, however, on page 10, first paragraph, line 7. Caution should be taken with recommendation for social media use for education due to privacy issues and unintentionally promoting healthcare through unreliable sources on the internet.

Readability: The paper is well-written and easy to read.

Specifically, consider the following elements: Information is presented in an organized way. Headings and subheadings are used effectively. Paragraphs are coherent. The style is readable and easy to follow. Meanings are clear.

Appendix D cont.- Review

Rating: Excellent

Comments: The article is well organized with proper headings as subjects change.

Quality of accessories: Art and other accessories (i.e. tables, figures, graphics, photos, illustrations, etc.) provide value to the reader and agree with the text.

Rating: N/A

Comments: No Art or other accessories

Originality: The manuscript is novel and interesting to publish for a PA audience. The reviewer has no concerns about the originality of the work (plagiarism). Ideas and materials of others are appropriately attributed.

Rating: Excellent

Comments: The article show no signs of plagiarism when placed through online search tool.

Suggest accessories

Please indicate any x-rays, anatomic drawings, illustrations, tables, algorithms, or other accessories that might improve the article. If you know of online resources that might benefit the reader, please indicate these as well so that the links can be included in the online version of the article. None

Your final recommendation (select one)

___**xx**_ **Accept manuscript for publication** (the author does not need to make any revisions)

_____ **Ask author to revise manuscript and re-submit** (if revisions are adequate, the manuscript should be published)

_____ **Reject manuscript** (the article is not suitable for publication, either because the topic is not suitable or the quality of the manuscript is too poor)

Appendix D cont.- Review

Please add any final comments.

Very good literature review. I would expect to see this article in a Journal such as Journal of American Academy of Physician Assistants (JAAPA) in the commentary section.

A note of caution

Once completed you are asked to directly forward this peer-review un-blinded to the author whether the manuscript is accepted or rejected. Please make sure that the tone and content of your review are appropriate. Your comments should be honest, specific, fair, constructive, and professional.

Peer-Reviewer Name: ___Don Williams_____

Date: ____11/01/2018_____

Appendix D cont.- Review

Professor Comments: Professor Rust provided input on the manuscript which pertained to the title page and grammatic errors, all of the corrections have been addressed.