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Delivery of Evidence-based Tobacco Use Interventions in Primary Care

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Delivery of Evidence-based Tobacco Use Interventions in Primary Care

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Final Capstone Report

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Capstone Report Introduction

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Introduction

Tobacco use is a major contributor to overall morbidity and mortality in the United States. Cigarette smoking and exposure to tobacco smoke contribute to approximately one in every five deaths annually in the United States (Centers for Disease Control and Prevention [CDC], 2013). The most common causes of smoking-attributable death are lung cancer, chronic obstructive pulmonary disease (COPD), and ischemic heart disease (United States Department of Health and Human Services [HHS], 2004). Tobacco use also leaves a heavy economical burden on the U.S. with approximately $193 billion in direct medical expenses and lost productivity being attributable to smoking each year (CDC, 2013).

Over 50% of smokers make a quit attempt each year but most smokers make multiple quit attempts before being successful (CDC, 2013). Counseling and medication have been shown to be effective interventions in assisting smokers to make successful smoking cessation attempts (Fiore et al., 2008). Primary care providers play a key role in assisting tobacco users in their quit attempts. The Public Health Service clinical practice guideline on *Treating Tobacco Use and Dependence* gives specific recommendations on identifying and assisting tobacco users in the health care setting. By following guideline recommendations, primary care providers can make a considerable impact on their patients' abilities to successfully quit smoking.

This capstone report presents three manuscripts which focus on tobacco use interventions in the primary care setting. The first manuscript presents a critical analysis of the Public Health Service guideline on *Treating Tobacco Use and Dependence*. The

second manuscript presents a literature review pertaining to interventions that increase

primary care provider compliance with guideline recommendations. The literature

obtained from these first two manuscripts led to a descriptive study, which examined

the documentation and implementation of specific guideline recommendations in a

primary care clinic. The third and final manuscript details this study, and

presents some practical implications for improving documentation and implementation of

tobacco use interventions in primary care.

Tobacco Use and Dependence Guideline: An Analysis

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Abstract

This paper discusses and analyzes the Public Health Service clinical practice guideline *Treating Tobacco Use and Dependence: 2008 Update*. The guideline provides evidence-based recommendations on interventions and treatments for tobacco users in a clear and concise manner that can easily be applied by a variety of health care providers. This paper will discuss the development process of the guideline, stakeholder involvement, editorial independence, and overall presentation and application of the guideline. Comparison of the guideline to the U.S. Preventive Services Task Force recommendations and application of a theoretical framework to guideline recommendations will also be discussed.

Tobacco Use and Dependence Guideline: An Analysis

Tobacco use, the leading cause of preventable morbidity and mortality, continues to be a significant health issue in the United States (Centers for Disease Control and Prevention [CDC], 2013). Each year approximately 8.6 million people in the United States suffer from a smoking-attributable disease and 443,000 of these individuals die from smoking or exposure to secondhand smoke (CDC, 2013). Tobacco use can lead to heart disease, cancer, and pulmonary disease as well as exacerbate existing chronic health conditions (United States Department of Health and Human Services [HHS], 2004). Tobacco use also leaves a heavy economical burden on the U.S. with approximately $193 billion in direct medical expenses and lost productivity being attributable to smoking each year (CDC, 2013).

The prevalence of smoking among adults varies by state and region with the lowest rate of smoking in Utah at 11.8% and the highest rate in Kentucky with 29% of adults reporting current cigarette smoking in 2011 (CDC, 2013). The overall prevalence of adults who use smokeless tobacco products was 4.4% in 2011, with a prevalence of 6.8% in Kentucky (CDC, 2013). Kentucky has a high prevalence of tobacco use as it is a tobacco-growing state in which the use of tobacco is embedded into the culture (CDC, 2013).

Tobacco use cessation can greatly benefit overall health at any age (CDC, 2011; CDC, 2013). In 2010, nearly 70% of adult smokers reported interest in smoking cessation and over 50% of smokers had made at least one quit attempt in the past year (CDC, 2011). However, only 6.2% of smokers surveyed reported a successful smoking cessation attempt (CDC, 2011). These statistics demonstrate many smokers are willing to

quit but face many challenges in their attempts at quitting. In order to increase successful

quit attempts, health care providers should identify tobacco users and provide assistance

to those individuals attempting to quit.

Clinical practice guidelines can assist providers in delivering evidence-based care

when intervening with a tobacco user. In 2008, the Public Health Service published the

clinical practice guideline *Treating Tobacco Use and Dependence: 2008 Update* (Fiore et

al., 2008). The guideline was originally developed to provide evidence-based

recommendations on interventions and treatments that health care providers can utilize to

help tobacco users overcome their dependence on tobacco. The guideline focuses on

simple, adaptable approaches to assessment and treatment of tobacco users that can be

used in a variety of settings by virtually any health care provider. The guideline was

updated to include new treatments for tobacco dependence, such as varenicline, that have

become available since the previous guidelines were published in 1996 and 2000 (Fiore

et al., 2008).

<div align="center">**Stakeholder Involvement**</div>

The 2008 updated guideline was sponsored by eight private nonprofit and

government organizations. These organizations included the Agency for Healthcare

Research and Quality (AHRQ), the CDC, the National Cancer Institute (NCI), the

National Heart, Lung, and Blood Institute (NHLBI), the National Institute on Drug Abuse

(NIDA), the American Legacy Foundation, the Robert Wood Johnson Foundation, and

the University of Wisconsin Center for Tobacco Research and Intervention (UW-CTRI).

The guideline was published by the Public Health Service (PHS) as tobacco use is an

important health issue to all Americans (Fiore et al., 2008).

The guideline consortium included many of the top organizations involved in tobacco use prevention, control, and treatment. Other organizations that are involved in reducing the impact of tobacco use in the United States and could have contributed to guideline development include the American Cancer Society (ACS), the American Lung Association, and the Association for the Treatment of Tobacco Use and Dependence (ATTUD). Due to the direct link between tobacco use and several types of cancer (HHS, 2004), the American Cancer Society is often involved in research, events, and policy directed at reducing the negative health effects of tobacco use (ACS, n.d.). Tobacco use can also cause and exacerbate chronic lung conditions such as asthma or chronic obstructive pulmonary disease (HHS, 2004). The American Lung Association is very active in secondhand smoke exposure and tobacco use prevention, control, and treatment (American Lung Association, n.d.). ATTUD is an organization of providers dedicated to promoting evidence-based tobacco use treatment (ATTUD, n.d.). For future updates of the guideline, input from these organizations should be sought to expand the knowledge base and expertise involved in guideline development.

Rigor of Development

Evidence was obtained from systematic reviews conducted for the original guidelines in 1996 and 2000 as well as an updated systematic review of evidence from 1999 to 2007. Prior to the updated systematic review, the guideline panel selected eleven topics for updated meta-analysis, including the effectiveness of varenicline. A literature search of eleven electronic databases and published abstracts and bibliographies was conducted. A total of 8,700 articles were screened for the systematic reviews including 2,700 new articles screened since the 2000 guideline (Fiore et al., 2008).

Literature reviewers screened article abstracts for inclusion and exclusion criteria. Articles were included in meta-analysis if they met the following criteria: reported results of a randomized controlled trial (RCT) of a tobacco use treatment intervention, provided at least 5 months of follow up after the quit date (except for pregnant smokers), were published in English in a peer reviewed journal between January 1975 to June 2007, and pertained to one of the 11 topics chosen for 2008 guideline meta-analysis. More than 300 articles were identified for inclusion in meta-analysis (Fiore et al., 2008).

Evidence obtained from the literature search was then reviewed by three independent reviewers and coded into evidence tables using the same coding process employed by the 2000 guideline. Articles were reviewed to assess relevancy to the treatment characteristic being evaluated. Selected articles were then reviewed for specific screening criteria and for possible confounders in the treatment or control arms. Studies that were deemed appropriate by the panel were then analyzed using meta-analysis. The primary meta-analytic model used was logistic regression using random arms modeling. Logistic regression coefficients obtained from the meta-analysis were then converted to odds ratios with 95 percent confidence intervals (CI). The odds ratios were then converted to abstinence percentages with 95 percent confidence intervals. The abstinence percentages represent an estimated long-term abstinence rate obtained under the tested treatment (Fiore et al., 2008).

Evidence was also graded for quality and strength using a rating scheme. Evidence supporting a recommendation was given a grade "A" if multiple, well-designed RCTs produced consistent results supporting the recommendation. A grade of "B" indicated that evidence from RCTs supported the recommendation but the evidence was

not optimal. For example few RCTs existed or the trials were inconsistent.

Recommendations based on consensus or nonrandomized trials were given a grade "C"

(Fiore et al., 2008).

It is important for clinicians to consider possible limitations and bias when

reviewing any evidence-based recommendations. There are limitations and areas for

potential bias with meta-analyses including inclusion and exclusion criteria selected,

methods of analysis, and heterogeneity of results. Due to publication bias, meta-analyses

may not always represent the true sample of all studies undertaken but may be more

representative of studies with favorable results.

Most recommendations were based on numerous well designed studies. In areas

such as policy issues or cost-effectiveness in which randomized trials are difficult, the

strength of the evidence was based on the number, quality, and consistency of studies. In

areas in which evidence was weak or inconsistent, the panel declined to make

recommendations. The guideline was also validated by 81 external peer reviewers and

fifteen members of the public (Fiore et al., 2008). Therefore, clinicians can be confident

that the guideline recommendations are valid and evidence-based.

The guideline does not specify the procedure for updates. However the

current version of the guideline is an update to the original guidelines published in 1996

and 2000. The 2000 guideline was updated due to new treatments that have become

available for tobacco dependence (Fiore et al., 2008). Since the guideline was published

in 2008 new technologies and treatments, such as the e-cigarette, have emerged which

may warrant a new update.

Clarity and Presentation

The guideline highlights ten key recommendations that are listed immediately following the abstract of the document. These recommendations provide an overview of the more detailed, specific recommendations provided later in the document. An example of one of the key recommendations is "It is essential that clinicians and health care delivery systems consistently identify and document tobacco use status and treat every tobacco user seen in a health care setting" (Fiore et al., 2008, p. vi). For each of the recommendations the guideline provides a table with summary of the evidence (odds ratio and abstinence rates with 95% CI) and a discussion of clinical practice suggestions and future research recommendations.

In Chapter 2 of the document an algorithm is provided which details the steps a provider should take to identify and treat a tobacco user seen in a health care setting. Other key recommendations include providing brief and repeated interventions as tobacco cessation typically involves multiple quit attempts. The guideline also discusses the importance of clinically and cost-effective treatment, including counseling and medication, in the key recommendations (Fiore et al., 2008).

The guideline outlines strategies that clinicians can use based on the patient's current tobacco use status and willingness to quit. For example the guideline provides strategies to prevent relapse in former smokers and discusses motivational techniques to encourage tobacco users unwilling to quit to consider making a quit attempt. The guideline discusses in depth the available treatment options for tobacco use and dependence including medications and counseling. The guideline also covers systems interventions, cost-effectiveness of tobacco use interventions, and special populations

such as pregnant smokers (Fiore et al., 2008). For more detailed information on guideline recommendations see Appendix A.

Application

The guideline indicates clinicians are inconsistently delivering tobacco use interventions to their patients and cites evidence of a lack of systems support, such as training or automated prompting. The guideline gives recommendations to overcome these barriers such as designating a staff member to coordinate tobacco dependence treatments. This individual would ensure that clinicians receive adequate training and performance feedback as well as provide sufficient resources to provide the recommended treatments to patients (Fiore et al., 2008). The guideline also recommends the promotion of policies that support tobacco dependence services and the use of a tobacco user identification system in every clinic. By dedicating staff members to champion tobacco use interventions and employing policies and procedures that identify tobacco users and promote tobacco dependence treatments, guideline recommendations can more readily be implemented.

Another major obstacle to the implementation of tobacco use treatments is the financial cost of recommended treatments such as medication. Insurance coverage of tobacco use interventions has drastically improved since the first guideline was published in 1996. However comprehensive coverage is still inconsistent among private insurers and state Medicaid programs (Fiore et al., 2008). The guideline recommends all tobacco dependence treatments deemed effective by the evidence presented in the guideline should be covered services for all members of health insurance packages.

The tobacco dependence treatments highlighted in the guideline, such as counseling and medication, are highly cost-effective relative to other reimbursed treatments such as routine mammography or hypertension treatment. For example the estimated cost per life-year saved of nicotine replacement therapy is $3,455 as compared to annual cervical cancer screening for women ages 34 to 39 which is $4,100 (Song et al., 2002; Tengs et al., 1995). The guideline discusses cost-effectiveness of tobacco dependence treatment in terms of cost per quality-adjusted-life-year (QALY) saved, cost per quit, health care costs and utilization pre- and post-quit, and return on investment for coverage. For example, costs of tobacco dependence treatment have been estimated to range from a few hundred to a few thousand dollars per QALY saved (Fiore et al., 2008).

Theoretical Framework

Clinicians often utilize the principles and features of theoretical frameworks to apply guideline recommendations. The Transtheoretical Model, or stages of change model, is often utilized and applied to tobacco cessation intervention and treatment. The Transtheoretical Model was developed by Prochaska and DiClemente and utilizes the dimensions of stages of change and processes of change (DiClemente et al., 1991; Prochaska & DiClemente, 1983). Stages of change include Precontemplation, Contemplation, Preparation, Action, and Maintenance. Processes of change include activities or events that create successful behavior modification. Examples include helping relationships, self reevaluation, and consciousness-raising (DiClemente et al., 1991).

The Transtheoretical Model has been used to help change many health behaviors including tobacco use. The Precontemplation stage of change as it relates to tobacco

cessation is typically defined as an individual with no plans to quit within the next six months. Individuals in the Contemplation stage are thinking about quitting tobacco in the next six months. The Preparation stage is defined as individuals planning on quitting in the next thirty days. Action represents individuals that have initiated a quit attempt. Individuals move onto the Maintenance phase once they have been quit for a defined amount of time, usually six months to one year. Individuals usually cycle through the stages of change. In other words, most people attempting to quit relapse and may move back into the Precontemplation, Contemplation, or Preparation stages (Anczak & Nogler, 2003; DiClemente et al., 1991; Prochaska & DiClemente, 1983).

Anczak and Nogler (2011) describe ways in which primary care providers can utilize the Transtheoretical Model to promote smoking cessation in their patients. For patients in the Precontemplation and Contemplation stages, the provider should advise the patient to quit and inform the patient on the adverse effects of smoking. The guideline also recommends motivational interviewing for individuals in these stages (Fiore et al., 2008). In the Preparation stage, the provider can begin discussing strategies for quitting, such as behavior modification and medication use. Providers should give support, provide positive reinforcement, and schedule frequent visits during the Action phase to prevent relapse (Anczak & Nogler, 2011). Preventing relapse continues to be important in the Maintenance phase. The guideline suggests that clinicians review the benefits of quitting, reinforce the patient's success at quitting, and address any problems that have arisen from quitting with individuals who have recently quit (Fiore et al., 2008). Overall the clinician's role in utilizing the Transtheoretical Model in tobacco cessation is

to motivate patients to quit and assist patients that are motivated in successfully quitting

and maintaining abstinence (Anczak & Nogler, 2011; Fiore et al., 2008).

Editorial Independence

The guideline was developed and funded by the Public Health Service, a U.S.

governmental agency. As mentioned previously it was sponsored by eight nonprofit

private and governmental organizations. A two-step procedure was followed to evaluate

potential conflicts of interest among panel members. Prior to the first panel meeting in

October 2006, all panel members completed a general screening process in which

potential conflicts of interest over the last five years were reported in a narrative fashion.

Prior to the second meeting in 2007 panel members underwent a more detailed disclosure

process based on the Department of Health and Human Services guidelines for the

conduct of research. After the disclosure process, three panel members were excluded

due to areas of conflict and one panel member voluntarily excluded himself from panel

deliberations and guideline development. The guideline provides a summary of all

disclosures made by panel members (Fiore et al., 2008).

Recommendation

In 2009, The U.S. Preventive Services Task Force (USPSTF) released

recommendations on counseling and other interventions to prevent tobacco use and

tobacco-related disease. The USPSTF reviewed the evidence from the Public Health

Service guideline and had similar recommendations based on this evidence. Both

guidelines recommend the use of a specific method called the 5As when interacting with

tobacco users. The USPSTF addresses pregnant tobacco users but does not discuss other

special populations such as children or light smokers as does the PHS guideline (Fiore et

al., 2008; USPSTF, 2009). Both guidelines agree that counseling with practical guidance and social support should be an included component of tobacco cessation interventions. The PHS guideline provides detailed recommendations on pharmacotherapy while the USPSTF guideline only briefly mentions tobacco cessation medications approved by the U.S. Food and Drug Administration (FDA). Both guidelines agree that a combination of counseling and medications are more effective than either intervention performed alone (Fiore et al., 2008; USPSTF, 2009).

Overall, both guidelines were created to provide recommendations to clinicians on effective interventions to prevent tobacco-related disease and promote tobacco cessation. Though either guideline can easily be used to screen and assess tobacco users, the PHS guideline is more useful in providing tobacco cessation treatment. The PHS guideline provides more detailed, practical, and specific recommendations on tobacco cessation treatments that can easily be utilized by clinicians in practice (Fiore et al., 2008; USPSTF, 2009).

Nurse practitioners and other providers are highly involved in preventive health care services such as tobacco cessation. It is the ethical and perhaps legal responsibility of nurse practitioners to identify their patients that use tobacco and use evidence-based, effective strategies to treat tobacco dependence. It has been suggested that failure to address and treat preventable causes of disease using established standards of care, such as clinical practice guidelines, can be viewed as a violation of the legal duty providers owe to their patients (Torrijos & Glantz, 2006). Therefore it is critical that providers follow evidence-based recommendations for intervening with tobacco users in attempts to reduce tobacco-related death and disease.

The PHS guideline can serve as the foundation to providers' interventions with tobacco users. Providers in any health care setting can apply the guideline to their patients who abuse tobacco and motivate and assist their patients to quit. By utilizing clinical practice guidelines to guide tobacco cessation interventions, nurse practitioners can have a positive and lasting effect on the health of their patients as well as the population at large.

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Improving Primary Care Provider Compliance with Tobacco Use Guidelines:
A Review of Evidence-based Interventions

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Abstract

Tobacco use is a major contributor to overall morbidity and mortality in the United States. Smoking cessation is the only proven method to reduce the harmful personal health effects associated with tobacco use. Primary care clinicians have a responsibility to intervene with tobacco users and increase successful cessation attempts. Evidence-based strategies are available to assist providers in treating tobacco use. However, many providers do not address tobacco use adequately. The Public Health Service released clinical practice guidelines in 1996 and 2000 with an update in 2008 on tobacco use and dependence. This paper reviews the current literature on strategies to increase provider compliance with tobacco use guideline implementation, specifically use of the 5A method. Sixteen studies from a meta-analysis and a literature search were selected for review. The studies discussed educational interventions, financial incentives, provider feedback, vital sign stamps, and multi-component interventions to increase guideline compliance. Overall, multi-component interventions were found to be most effective in improving provider performance of guideline recommendations. Further investigation may be warranted on specific educational components, frequency and method of feedback, and interventions to increase follow-up.

Improving Primary Care Provider Compliance with
Tobacco Use Guidelines: A Review of Evidence-based Interventions

Tobacco use is the leading cause of preventable mortality and morbidity in the

United States (Centers for Disease Control and Prevention [CDC], 2009). Tobacco use

and dependence is a chronic disease that often requires multiple interventions and

attempts to quit (Fiore at el., 2008) Quitting smoking has both immediate and long term

health benefits and is the only proven method to reduce the pathologic effects of cigarette

smoke on cardiovascular and pulmonary health (United States Department of Health and

Human Services [HHS], 2004; HHS, 2010). Reduction in the number of cigarettes

smoked daily has not been shown to significantly benefit health. Complete smoking

cessation is the only proven method in reducing the harmful effects associated with

tobacco use (HHS, 2010).

Smoking cessation is an extremely difficult behavioral health change for

individuals partly due to the addictive nature of nicotine (CDC, 2013). In 2010 sixty-

eight percent of adult smokers surveyed said they wanted to quit smoking but only six

percent of smokers had successfully quit in the past year (CDC, 2011). To optimize

chances for success with smoking cessation smokers need support and guidance from

trained health professionals who provide evidence-based treatment options.

Evidence-based practice guidelines exist to direct clinicians in providing effective

tobacco use treatment options. In 2008, the Public Health Service published an update to

its clinical practice guideline for treating tobacco use (Fiore et al, 2008). The overall goal

of the guideline is to encourage clinicians to offer effective tobacco dependence

treatments and for health care systems to support and assist clinicians in making these

treatments available to patients (Fiore et al., 2008). Since over 70 percent of smokers

visit a primary care setting at least annually, primary care providers are in a key position to intervene with patients who use tobacco (Fiore et al., 2008). However, many providers do not capitalize on this opportunity. In 2010, less than half of adult smokers reported being advised by their health care professional to quit (CDC, 2011).

The guideline recommends a brief cost-effective intervention known as the 5As. The 5As include *ask* if the patient uses tobacco, *advise* the patient to quit, *assess* for willingness to quit, *assist* the patient in their quit attempt, and *arrange* for follow-up (Fiore et al., 2008). Evidence suggests this intervention is not only effective in increasing smoking cessation but also increases overall satisfaction with health care (Conroy et al., 2005; Fiore et al., 2008). Implementing systems interventions and strategies that increase provider use of this brief intervention is an important part of tobacco cessation efforts.

A recent meta-analysis evaluated strategies and interventions to increase compliance with guidelines and the delivery of smoking cessation treatments in primary care (Papadakis et al., 2010). The meta-analysis found multi-component interventions (Odds Ratio [OR] 2.2; 95% Confidence Interval [CI] 1.7-.8) and adjunct counseling (OR 1.7; 95% CI 1.5-2.0) to be effective in increasing smoking cessation (Papadakis et al., 2010). This paper will expand on this meta-analysis, discuss in more detail its implications for practice, and provide suggestions for further research.

Methods

Abstracts from all studies in the meta-analysis (n=38) as well as studies identified through an electronic database search were evaluated for inclusion and exclusion criteria. A literature search using CINAHL database with the keywords tobacco use OR smoking, cessation, and guidelines (n=173) and the keywords tobacco use OR smoking, cessation,

and improvement (n=214) was conducted. Search limits were set for full text, peer

reviewed English language publications from 2002 to 2014. Selection criteria included

studies that were set in the primary care setting, included interventions directed at

providers, and assessed the effect interventions had on performance of two or more of the

5As. Studies were excluded if they focused on a specific population or disease state,

such as pregnant women, assessed rates of medication use for smoking cessation rather

than overall cessation rates, or focused on systems interventions. A total of eleven

studies from the systematic review and five studies from the database search met

selection criteria.

Results

Interventions used to improve compliance with smoking cessation guidelines fell

into five distinct categories: vital sign stamp or electronic prompt, provider feedback,

financial incentives, educational interventions, and multi-component interventions.

Studies varied in design, sample size, and methods of data collection. Table 1 provides a

brief summary of each study including outcomes of each study as they relate to the effect

the intervention had on the 5As of smoking cessation treatment.

Vital sign stamp/electronic prompt

Four studies evaluated the effects of a vital sign stamp or electronic prompt on

guideline implementation and smoking cessation (Milch, Edmunson, Beshansky, Griffith,

& Selker, 2004; Piper et al., 2003; Rothemich et al., 2008; Szpunar, Williams, Dagroso,

Engerg, & Chesney, 2006). Piper et al. (2003), Rothemich et al. (2008), and Milch et al.

(2004) used a vital sign stamp that included smoking status for intervention groups.

Medical personnel who roomed the patient would stamp the chart and then document

smoking status. Rothemich et al. (2008) found a significant increase in asking about

tobacco use with 26.3% of control patients versus 66.0% of intervention patients ($p<.001$)

reporting being asked about tobacco use. There was also a significant increase in

cessation counseling with 61.9% of intervention patients versus 53.4% of control patients

($p=.04$) reporting being counseled by their provider. Piper et al. (2003) demonstrated a

positive increase in staff *asking* patients about smoking status with a 30.9% increase in

the intervention group versus a 9.6% increase in the control group ($p=.002$). No effect

was seen with seven day point prevalence abstinence rates, number of quit attempts, or

advice, assistance, or *arrangement* of follow-up. Neither study by Piper et al. (2003) nor

Rothemich et al. (2008) reported odds ratios.

Milch et al. (2004) compared an enhanced intervention of a smoking assessment

questionnaire (SAQ) to utilizing a vital sign stamp and a control group. The SAQ

consisted of a six item questionnaire filled out by the patient in the waiting room prior to

the visit and a section for the clinician to assess patient's readiness to quit and document

cessation interventions. The SAQ group had significantly higher rates of smoking status

documentation (91% vs. 86% vs. 49%; $p<.001$), cessation advice (47% vs. 38% vs. 30%;

$p=.014$), and self-reported cessation (12% vs. 2% vs. 4%; $p<.001$) as compared to the

vital sign stamp group and control group respectively. Patients were considered to have

quit smoking if at the time of phone interview follow-up (nine to ten months after the

intervention) they stated they were no longer smoking, could identify a quit date, and had

not smoked since their quit date. However when comparing the SAQ arm directly to the

control arm there was a more significant rate of cessation advice ($p<.005$). Odds ratios

were not reported.

The fourth study conducted by Szpunar et al. (2006) utilized a similar study design to Milch et al. (2004). However Szpunar et al. (2006) implemented their interventions as part of the electronic medical record (EMR). In the first intervention arm, the medical assistant or nurse would assess tobacco use status and willingness to quit as part of the check in process. This intervention resulted in significantly higher rates of *asking* about tobacco use (OR 1.443, 95% CI 1.240-1.679; *p*<.009). In the second intervention arm, clinicians would be prompted to document on advising and assisting the patient to quit and arranging follow-up based on the patient's tobacco use status and willingness to quit. Higher rates of compliance with all 5As were noted after implementation of the second intervention arm, however only rates of *asking* (OR 2.008, 95% CI 1.710-2.359; *p*<.001) and *assessing* (OR 1.585, 95% CI 1.124-2.235; *p*=.01) were statistically significant (Szpunar et al., 2006).

Overall the studies by Milch et al. (2004), Piper et al. (2003), Rothemich et al. (2008), and Szpunar et al. (2006) demonstrate adding tobacco use status to vital sign documentation can increase rates of *asking* about tobacco use. Identifying tobacco users is a critical step in the 5A process as it must be completed prior to implementation of the other 4As. Milch et al., (2004) and Szpunar et al. (2006) demonstrated that adding an enhanced intervention with further prompts or questions related to tobacco use can increase rates of giving *advice* and *assessing* willingness to quit.

Provider Feedback

Two studies used provider feedback to improve compliance with utilizing the 5As method (Andrews, Tingen, Waller, & Harper, 2001; Bentz et al., 2007). Bentz et al. (2007) gave providers in the intervention arm monthly reports from the electronic health

record detailing individual performance of *asking, assessing, advising*, and *assisting* with tobacco cessation. Each clinician's performance was compared to the local clinic average and a standard benchmark of care. Twelve monthly reports were given during the study period. During a twelve month follow-up period electronically documented rates of *advising* (OR 1.36, 95% CI 1.33-1.39)*, assessing* (OR 1.63, 95% CI 1.53-1.69), and *assisting* with cessation (OR 1.92, 95% CI 1.78-2.08) were significantly improved ($p<.001$) in the intervention arm as compared to the control arm (Bentz et al., 2007).

Andrews et al. (2001) found a significant improvement in *advising* ($p=.05$), *assisting* ($p=.001$), and *arranging* follow-up ($p=.001$) after written individual and team feedback reports were given to providers. Rates of giving advice improved from 79.6% at baseline to 100% after feedback. Rates of assistance increased from 32.5% at baseline to 89.3% and arrangement of follow-up increased from 0% at baseline to 17.8% after feedback. Odds ratios were not reported. This study was conducted based on the 1996 guideline which did not include *assess* willingness to quit (added in 2000 guideline). Reports were generated from chart reviews of all patients seen by each provider in a 4 week time span. Prior to the study, a vital sign stamp that included smoking status had been implemented. This intervention resulted in 100% compliance with *asking* about smoking status (Andrews et al, 2001).

The results of Andrews et al. (2001) and Bentz et al. (2007) indicate that providing periodic feedback to providers on performance of the 5As can increase compliance with the 5A method. In addition, Andrews et al. (2001) demonstrated that adding written feedback to a vital sign stamp intervention may result in full

implementation of tobacco use interventions. Unfortunately, the study did not measure

the effect of feedback on assessing willingness to quit.

Both studies also conducted educational training prior to producing feedback

reports. Bentz et al. (2007) held 30 minute training sessions for all providers and staff in

both the intervention and control groups on cessation strategies including motivational

counseling, approved pharmacotherapy, and referrals to the state quit line. Andrews et al.

(2001) held a 90 minute educational session on tobacco dependence, the four As,

treatment strategies, and clinical practice guidelines. Andrews et al. (2001) reported no

significant effects of the educational session on provider performance of *advising,*

assisting, or *arranging* follow-up. Bentz et al. (2007) did not measure for any effect the

educational session had on guideline compliance.

Financial Incentives

Providing financial incentives to medical group practices or clinicians for

compliance with tobacco cessation guidelines may increase identification of tobacco use

status (Roski et al., 2003) and the provision of advice to quit (Coleman, Lewis, Hubbard,

& Smith, 2007). Roski et al. (2003) set target rates at 75% for documentation of tobacco

use status and 65% for provision of advice to quit. Bonus payments of $5,000 to $10,000

were given to each clinic that met or exceeded the target rates. Documentation of

tobacco use status significantly improved by 14.1% in the incentive group versus 6.2% in

the control group (*p*=.0009). There was no statistically significant difference between the

control group and financial incentive group for advising or assisting smokers to quit

despite the incentive for provision of advice. Similar seven day point prevalence

abstinence rates were noted with self reported quitting rates of 19.2% and 22.4% in the

control and incentive groups, respectively (Roski et al, 2003). Odds ratios were not reported. The authors of the study speculate that the overall lack of effect of financial incentives may be due to lack of knowledge of the incentives and diversion of the providers' attention to other pressing issues such as increasing productivity and decreasing costs (Roski et al., 2003).

Coleman at al. (2007) examined rates of smoking status documentation, receipt of smoking cessation advice, and prescriptions for nicotine addiction treatments before and after a contract was established for general practitioners in the United Kingdom. The contract provided financial incentives for general practitioners that met certain target sets within a defined Quality Outcome Framework. An example of a target that would qualify clinicians for incentives is the smoking status of at least 75 percent of patients aged 15-75 years is recorded in the last five years. Documentation of smoking status (rate ratio [RR] 1.88, 95% CI 1.87-1.89) and brief smoking cessation advice (RR 3.03, 95% CI 2.98-3.09) increased after implementation of financial incentives. However since there was no target set for prescribing nicotine addiction medications, the contract appeared to have little effect on prescription of nicotine addiction products (Coleman et al., 2007). Overall, financial incentive programs may improve rates of documenting tobacco use status and giving advice to quit, however the feasibility and cost of this intervention may limit its implementation in primary care when compared to less costly interventions such as a vital sign stamp.

Educational interventions

Three studies implemented educational interventions for providers to increase clinician compliance with the 5As (Caplan, Stout, & Blumenthal, 2011; DePue et al.,

2002; Unrod et al., 2007).   All three studies showed promising results in increasing

compliance with 5A implementation using education and training. Both Caplan et al.

(2011) and Unrod et al. (2007) demonstrated favorable results with significant increases

in rates of *advising* (*p*<.0001)*, assessing* (*p*<.0001)*, assisting* (*p*<.0001), and *arranging*

follow-up (*p*<.0001). Caplan et al. (2011) conducted two 90 minute training sessions for

clinicians and support staff on the Public Health Service tobacco use guideline and

Pathways to Freedom, a program specific to African-American smokers. Percentage of

charts that documented evidence of *advice* (12% to 29%), *assessment* (5% to 24%),

assistance (6% to 21%), and *arrangement* of follow up (6% to 17%) increased

significantly after the intervention (*p*<.0001). All charts had documentation of smoking

status (*asked*) both pre- and post-intervention. Odds ratios were not reported. (Caplan et

al., 2011)

　　　　Unrod et al. (2007) conducted 40 minute individual training sessions with each

physician on smoking cessation counseling using the 5As method. In addition to the

educational intervention, tailored reports were generated from a pre-visit assessment that

included patient smoking-related information such as readiness to quit, smoking status,

and pros and cons of smoking. These reports were given to the patient and physician at

the time of the visit (Unrod et al., 2007). Patients seen by physicians in the intervention

group were more likely to be *assessed* about their willingness to quit (OR 5.06, 95% CI

3.22-7.95, *p*<.0001), given *advice* to quit (OR 2.79, 95% CI 3.22-7.95; *p*<.0001), and

have follow-up *arranged* (OR 8.14, 95% CI 3.98-16.68; *p*<.0001). Patients in the

intervention group also had a higher likelihood of receiving assistance with quitting in the

form of setting goals (OR 4.31, 95% CI 2.59-7.16; *p*<.0001), receiving written materials

(OR 5.14, 95% CI 2.60-10.14; *p*<.0001), discussing medications (OR 4.72, 95% CI 2.90-7.68; *p*<.0001), and being referred to a smoking cessation program (OR 6.48, 95% CI 3.11-13.49; *p*<.0001).

DePue et al. (2002) held three one hour training sessions that included information on effective tobacco interventions, system interventions to increase intervention delivery, and tobacco cessation counseling skills. The sessions were offered to all staff with patient contact. The first session included chart review feedback of baseline documentation of the 4As (based on 1996 guideline) and a review of the guideline. The second session reviewed tobacco use identification approaches and assisted with problem solving around system barriers. The third session focused on counseling skills and included role playing with challenging case examples.

Overall, rates of *asking* about tobacco use (OR 3.00, 95% CI 1.19-7.5) and *advising* patients to quit (OR 1.29, 95% CI 0.69-2.43) did increase after the educational intervention. However, statistically significant increases were only evident in certain visit types (p-values not reported). Yearly physicals and first time visits were related to an increased likelihood of *asking* about tobacco use (yearly physical: OR 35.83, 95% CI 24.90-51.57; first visit: OR 9.82, 95% CI 6.62-14.57) and *advising* to quit (yearly physical: OR 2.43, 95% CI 1.53-3.87; first visit: OR 2.17, 95% CI 1.26-3.76) as compared to medical follow up visits (DePue et al., 2002). This is most likely due to the fact physicals and initial visits are more focused on general health promotion and prevention rather than specific medical problems.

Multi-component interventions

Several studies combined the previously mentioned interventions to assess for effectiveness on guideline compliance and smoking cessation rates (Hung & Shelley, 2009; Katz, Muehlenbruch, Brown, Fiore, & Baker, 2004; Tingen, Andrews, Waller, & Daniel, 2004; Twardella & Breener, 2007; Young, D'Este, & Ward, 2002). Katz et al. (2004) utilized a vital signs stamp, a tutorial and feedback for intake clinicians, free nicotine replacement therapy for patients, and proactive telephone counseling. The tutorial and feedback for intake clinicians focused on assessing smoking status, delivering a brief cessation message, and providing assistance to individuals who expressed willingness to quit. After the intervention was implemented, patients at the intervention clinic sites were more likely to be *asked* about smoking status (OR 3.1, 95% CI 1.2-8.2; p=.02), be *assessed* for willingness to quit (OR 6.4, 95% CI 3.7-10.8; p<.001), and *assisted* with cessation (p<.001) than patients at control clinic sites. Assisting with cessation was defined as helping set a quit date (OR 33, 95% CI 11-100), distributing cessation literature (OR 21, 95% CI 8.8-49), or discussing pharmacotherapy (OR 3.9, 95% CI 2.5-6.3). No statistically significant difference was noted in *advice* to quit (OR 1.3, 95% CI 0.8-2.3; p=.29). However, the positive effect on quit attempts (OR 1.4, 95% CI 0.98-1.9; p=.06), two month quit rates (OR 3.3, 95% CI 1.9-5.6, p<.001), six month quit rates (OR 1.1, 95% CI 1.2-2.6; p=.009), and continuous abstinence (OR 3.4, 95% CI 1.8-6.3; p<.001) was statistically significant. Quit rates were determined based on self-reported abstinence over the past seven days at the two and six month follow-ups. Continuous abstinence was defined as self-reported abstinence at both the two and six month follow up (Katz et al., 2004).

Twardella and Brenner (2007) combined education, financial incentives, and

reimbursement for nicotine replacement therapy or bupropion in a 2×2 factorial design.

Medical practices were randomized to receive usual care, training plus incentive (TI),

training plus medication reimbursement (TM), or training, medication reimbursement,

and incentives (TI + TM). The financial incentive consisted of a provider payment of

130 euros for each patient who was smoke-free at twelve month follow-up. The

educational training consisted of a two hour session on stages of change, smoking

cessation counseling, and pharmacological interventions for smoking cessation. All

participants in the study were asked by the researchers about smoking status and

readiness to quit. The intervention only significantly affected assistance to quit in regards

to providing medication (nicotine replacement therapy or bupropion [OR 3.33, 95% CI

1.78-6.20; p=.003]). However, the study did report patients in the TM group (OR 4.77,

95% CI 2.03-11.22; p=.046) and TI + TM group (OR 5.43, 95% CI 1.48-19.84; p=.02)

had an increased odds of self-reported and serum cotinine verified smoking cessation at

12 months follow-up (Twardella & Brenner, 2007). Overall the study indicates that

combining provider education with reimbursement for cessation medications may be

effective in increasing cessation rates.

Tingen et al. (2004) completed a three phase study of the effects of an educational

intervention, written provider feedback, a tobacco use chart label, and clinician reminders

on documentation of *asking, advising, assisting*, and *arranging*. The first phase was a

baseline medical record review of the 4As (study conducted prior to 2000 guideline and

addition of *assess* willingness to quit). The second phase included a 60 minute

educational intervention for providers on the Public Health Service guideline and the

research project. Providers were also given a resource packet with a copy of the guideline and other useful cessation information and instructed on use of the chart label. An information session for healthcare staff was also conducted that presented information on the research project and use of the chart label. Medical record reviews were conducted 5 weeks after the educational intervention. During phase III written feedback based on phase I and II medical record review was given to clinicians. Feedback included individual and practice performance of the 4As. Email and flyer reminders were distributed to clinicians to encourage continued use of the guideline. Additional medical record reviews were conducted eight to ten weeks after the reminders.

Overall significant increases in rates of *asking, advising*, and *assisting* (*p<.0001*) were noted after the interventions. The most drastic increases in *asking* (69% to 97.6%)*, advising* (10% to 80%), and *assisting* (5% to 80%) were seen between phase I and phase II of the project. This demonstrates that the educational component and chart label had the most significant impact on delivery of the 4As. Odds ratios were not reported (Tingen et al., 2004).

Another study by Young et al. (2002) focused on improving physician advice to quit by implementing an academic detailing intervention, audit and feedback, and providing clinician, practice, and patient resources. Provider training focused on evidence-based cessation strategies and national clinical practice guidelines. Specific cessation strategies discussed in training included giving unequivocal advice to quit, negotiating a quit date, practical suggestions on how to quit, reinforcing verbal advice with written materials, recommending NRT, and arranging follow up. Resources for providers included a training video, copy of the guidelines, and prompt sheets to manage

smokers' reasons for not quitting. Practice resources included medical record prompts

and reminders. Free nicotine gum starter packs and brochures were provided to patients.

A maximum six month time period elapsed between baseline data collection and post-test

data collection.

Patient recall rates of *asking* about smoking status and giving *advice* were

significantly higher in the intervention group compared to the control group. However the

confidence intervals around the adjusted odds ratios overlapped indicating there was no

significant differences in the size of change in each group. Patient recall rates of

receiving *advice* about nicotine replacement therapy was statistically increased (nicotine

patch: OR 2.70, 95% CI 1.44-4.40; $p=.0056$ and nicotine gum: OR 5.31, 95% CI 2.68-

10.51; $p=.0002$) in the intervention group as compared to the control group. Medical

record documentation of smoking status (intervention group: OR 2.47, 95% CI 1.75-3.5;

control group: OR 2.88, 95% CI 1.18-7.04) and smoking cessation advice (intervention

group: OR 3.33, 95% CI 1.39-7.97; control group: OR 1.40, 95% CI 0.41-4.79) was not

significantly ($p>0.1$) improved in the intervention group than the control group (Young et

al., 2004).

Hung & Shelley (2009) distributed clinic and provider surveys to 497 primary

care providers and 60 primary care clinics to examine how the chronic care model (CCM)

improves provider delivery of the 5As of tobacco cessation services. The CCM is a

systems-level quality improvement framework that consists of six key concepts: decision

support, health systems and organization of health care, community resources, self-

management support, enhanced delivery system designs, and clinical information

systems. Providers practicing in clinics with self-management support (OR 2.98, 95% CI

1.11-7.98; *p*=.031), clinical information systems (OR 5.62, 95% CI 1.63-19.36; *p*=.008), and enhanced delivery system design (OR 2.04, 95% CI 1.40-2.98; *p*=.001) were significantly more likely to perform all 5A services (*p*<.05).

For their particular study Hung & Shelley (2009) defined self management support as a formal system to assist in the delivery of the 5As such as a vital sign stamp or medical record prompt. Clinical information systems were operationalized by whether a clinic maintained a registry of tobacco users and the extent to which providers documented tobacco-related information in the medical record. Enhanced delivery system design included group visits or activities for smokers ready to quit, use of dedicated staff to screen or counsel tobacco users, and a clinic champion to coordinate cessation activities.

Overall the study demonstrated that clinics following the chronic care model adhere more closely to tobacco use guidelines and have greater compliance with 5A delivery. Use of clinical information systems was the strongest correlate of 5As delivery. This suggests that population-based approaches, such as use of patient registries to monitor and implement tobacco use treatments as well as initiating electronic medical records and requiring documentation of smoking status, are effective in increasing 5A delivery (Hung & Shelley, 2009).

When comparing multi-component intervention studies, three studies (Hung & Shelley, 2009; Katz et al., 2004; Tingen et al., 2004) clearly demonstrated significant (*p*<.05) effects of 5A implementation. All of these studies implemented a chart label or vital sign stamp with other systems interventions such as education, feedback, or use of dedicated staff to implement tobacco use interventions. The other two studies (Twardella

& Brenner, 2007; Young et al., 2002) did not include a chart label or vital sign stamp. As stated previously the first step in implementation of the 5A method is the identification of tobacco users. Perhaps increased rates of *asking* about tobacco use within these studies would have yielded improved results in the implementation of the other 4As.

Discussion

Utilizing effective interventions to increase provider compliance with tobacco use guidelines has been found to increase smoking cessation rates. Determining the best interventions to utilize may vary by provider, patient, or practice. By reviewing current literature and selecting evidence-based strategies, providers may be better equipped to assist their patients who are tobacco users.

Recommendations for practice based on the previously discussed studies are summarized in Table 2. The vital sign stamp or chart label has been proven to be effective in increasing documentation of tobacco use status (Andrews et al, 2001; Hung & Shelley, 2009; Katz et al., 2004; Milch et al., 2004; Piper et al., 2003; Rothemich et al., 2008; Szpunar et al., 2006; Tingen et al., 2007) . The first step in intervening with a tobacco user is to identify that individual. Implementing a vital sign stamp is a low cost intervention that increases the identification of tobacco users. More studies on electronic prompts, such as the study by Szpunar et al. (2006), may help identify ways in which electronic health records can be developed to increase compliance with tobacco use guidelines. Clinics with electronic health records should attempt to add tobacco use status to vital sign documentation and check-in screens.

Provider feedback appears to be an effective intervention to increase provider compliance with tobacco use guidelines (Andrews et al., 2001; Bentz et al., 2007; Depue

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et al., 2002; Katz et al., 2004; Tingen et al., 2004; Young et al., 2002). However, the best

method and frequency of feedback has not yet been identified. Practices may elect to

survey providers to determine the method and frequency of feedback that will be best

received. Feedback may include clinic and individual performance of the 5As and could

be in the form of written reports, emails, or visible charts within the clinic. Cost of

producing feedback reports should also be considered when selecting method and

frequency of feedback. Growing use of electronic medical records may enable clinics to

more easily generate reports on provider performance of tobacco use guideline

recommendations.

Almost half of the studies demonstrated a positive effect of provider education on

compliance with the 5As and overall cessation rates (Caplan et al., 2011; DePue et al.,

2002; Katz et al., 2004; Tingen et al., 2004; Twardella & Brenner, 2007; Unrod et al.,

2007; Young et al., 2002). Length, content, frequency, intended audience, and method

(individual vs. group) of training sessions varied among studies. Further research is

needed to determine specific educational components to include in training.

Currently the Public Health Service tobacco use guideline recommends that all

clinicians receive training on methods to motivate and assist smokers to quit (Fiore et al.,

2008). Meta-analysis for the 2008 guideline demonstrated a positive effect (OR 3.2, 95%

CI 2.0-5.2) of clinician training on rates of providing tobacco use treatment (*assist*).

Additional meta-analyses from the guideline demonstrated that clinician training when

combined with a charting system, such as a vital sign stamp, increased the rates of

tobacco use assessment (*ask*) [OR 2.1, 95% CI 1.9-2.4], setting a quit date [OR 5.5, 95%

CI 4.1-7.4], providing materials (*assist*) [OR 4.2, 95% CI 3.4-5.3], and arranging follow-up (*arrange*) [OR 2.7, 95% CI 1.9-3.9].

A recent Cochrane review revealed similar results. Carson et al. (2012) found that health professionals that received training were more likely to help their patients with setting a quit date [OR 4.98, 95% CI 2.29-10.86; *p*<.0001], provide self-help materials (*assist*) [OR 3.52, 95% CI 1.90-6.52; *p*<.0001], provide cessation counseling (*advice*) [OR 2.28, 95% CI 1.58-3.27; *p*<.00001], and schedule follow up appointments (*arrange*) [OR 3.34, 95% CI 1.51-7.37; *p*<.00001]. Training also significantly increased point prevalence of smoking cessation (OR 1.36, 95% CI 1.20-1.55; *p*=.004) and continuous abstinence (OR 1.60; 95% CI 1.26-2.03; *p*=.03). Point prevalence is generally defined as smoking abstinence for the last seven days whereas continuous abstinence is no smoking for an extended amount of time, generally six to twelve months (Carson et al., 2012). The evidence from this literature review as well as recent meta-analyses clearly establishes the important role that health provider education and training has in increasing tobacco use interventions.

Using financial incentives to increase compliance with tobacco use guidelines has had mixed results in studies (Coleman et al., 2007; Roski et al., 2003; Twardella & Brenner, 2007). Clinics should focus on interventions that will promote sustained compliance with tobacco use guidelines. Many clinics may lack the resources to maintain financial incentive programs, thereby diminishing motivation to comply with guideline recommendations.

Overall combining multiple interventions may be the most effective approach to increase compliance with guideline recommendations. Clinics should consider available

resources, patient population, and provider experience, knowledge, and skills related to tobacco use treatment when considering which interventions to implement. Combining vital sign stamps, educational components, and feedback have been shown to increase rates of *asking, assessing, advising*, and *assisting* (Katz et al., 2004; Tingen et al., 2004).

Few studies demonstrated effective interventions in increasing arrangement of follow-up (Andrews et al., 2001; Caplan et al., 2011; Hung & Shelley, 2009; Szpunar et al., 2006; Unrod et al., 2007). Further research is needed to determine strategies effective in increasing rates of arranging follow-up. Poor compliance with arranging follow-up may be correlated to a lack of community resources, as three of the five studies that had a significant effect on arranging follow-up facilitated referrals to quit lines or had access to specialized clinics (Andrews et al., 2001; Caplan et al., 2011; Szpunar et al., 2006).

Continued research about the feasibility, utility, and cost-effectiveness of various interventions to increase compliance with tobacco use guideline recommendations should be conducted. Providers and clinic administrators should employ evidence-based strategies to increase compliance with guideline recommendations and evaluate outcomes. Specific strategies that have been shown to be effective include health care provider education (Caplan et al., 2011; DePue et al., 2002; Fiore et al., 2008; Katz et al., 2004; Tingen et al., 2004; Twardella & Brenner, 2007; Unrod et al., 2007; Young et al., 2002), charting systems such as a vital sign stamp (Andrews et al., 2001; Hung & Shelley, 2009; Katz et al., 2004; Milch et al., 2004; Piper et al., 2003; Rothemich et al., 2008; Szpunar et al., 2006; Tingen et al., 2007), and performance feedback (Andrews et al., 2001; Bentz et al., 2007; Katz et al., 2004; Tingen et al., 2004; Young et al., 2002). Clinical practice guidelines, such as the Public Health Service guideline on *Treating*

Tobacco Use and Dependence, provide a tool for clinicians to give patients evidence-based, quality care. Compliance with guideline recommendations is an essential step in improving health outcomes.

Table 1 Brief summary of included studies

	Study	*Design*	*Sample size*	*Setting*	*Effect on 5As*
Vital sign stamp	Rothemich et al., 2008	Cluster randomized controlled trial	6,729 patient surveys (1,149 smokers)	18 primary care practices	↑ Advice ↑ Ask
	Piper et al., 2003	Nonrandomized controlled trial with pre-test, post-test design	9,439 patient surveys (1,611 smokers)	5 primary health care clinics	↑ Ask
	Milch et al., 2004	Prospective nonrandomized controlled trial	1,265 patient visits (medical record review) 245 patient surveys (self-reported cessation)	Hospital-based adult primary care practice	↑ Ask ↑ Advice
	Szpunar et al., 2006	Pre-post cross sectional design	5,334 patient surveys (pre-implementation) 3,970 patient surveys (post-implementation)	6 primary care clinics	↑ Ask ↑ Assess
Provider feedback	Bentz et al., 2007	Cluster randomized clinical trial	102,915 patient records (15,435 smokers)	19 primary care clinics	↑ Advice ↑ Assess ↑Assist
	Andrews at al., 2001	Quasi-experimental study	637 patient records	Veterans Affairs Medical Center primary care center	↑ Advice ↑Assist ↑ Arrange
Financial incentives	Roski et al., 2003	3 condition group randomized efficient evaluation design	8812 patient surveys (1736 smokers)	37 primary care clinics of large multi-specialty medical group practice	↑ Ask
	Coleman et al., 2007	Longitudinal observational study	1,607,782 patient records	Database of routine United Kingdom primary care records	↑ Ask ↑ Advice

Provider education	Caplan et al., 2011	Pre- and post-test observational study	308 patient records	Georgia community health centers & primary care clinics serving predominantly African-American population	↑ Advice ↑ Assess ↑Assist ↑Arrange
	Unrod et al., 2007	Randomized controlled trial	518 patient surveys	Primary care clinics within a large New York City managed care organization	↑ Advice ↑Assess ↑Assist ↑Arrange
	DePue et al., 2002	Pre- and post-test observational study	1798 patient visits (pre) 1591 patient visits (post) 891 patient visits (1 year follow up)	14 community health centers in Rhode Island	↑ Ask ↑Advice
Multi-component intervention	Katz et al., 2004	Randomized controlled trial	2163 patient surveys	8 community based primary care clinics in southern Wisconsin	↑ Ask ↑Assess ↑Assist
	Twardella & Brenner, 2007	Cluster randomized trial, 2×2 factorial design	577 patient surveys	82 medical practices in Germany	↑ Assist
	Tingen et al., 2004	Repeated measures design	300 patient records	Large primary care practice within an academic medical center	↑ Ask ↑ Advice ↑ Assist
	Young et al., 2002	Cluster randomization trial	1788 patient surveys (baseline), 1727 patient surveys (post-test), 1023 patient records	39 family practice clinics in Australia	↑Advice
	Hung & Shelley, 2009	Cross-sectional survey design	497 provider surveys	60 primary care clinics serving low-income individuals in New York City	↑ Ask ↑Advice ↑Assess ↑ Assist ↑ Arrange

Table 2 Recommendations for practice

Recommendation	Rationale
Primary care practices should include tobacco use status as part of vital sign documentation.	Documenting tobacco use status with vital signs has been shown to increase *asking* about tobacco use (Andrews et al., 2001; Hung & Shelley, 2009; Katz et al., 2004; Milch et al., 2004; Piper et al., 2003; Rothemich et al., 2008; Szpunar et al., 2006; Tingen et al., 2007).
Brief educational interventions providing an overview of guideline recommendations and effective tobacco use interventions should be implemented in primary care clinics.	The guideline suggests that all clinicians and clinicians-in-training should be trained on effective methods in assisting tobacco users to become motivated to quit and successfully quit (Fiore et al., 2008). Studies have also demonstrated the effectiveness of provider training on improving rates of 5A compliance (Caplan et al., 2011; Carson et al., 2012; DePue et al., 2002; Katz et al., 2004; Tingen et al., 2004; Twardella & Brenner, 2007; Unrod et al., 2007; Young et al., 2002).
Feedback reports of provider performance of the 5As should be provided to primary care providers at regular intervals.	Provider feedback has been shown to increase compliance in *asking*, *assessing, assisting,* and *advising* and may help identify the need for additional interventions if performance is poor (Andrews et al., 2001; Bentz et al., 2007; Katz et al., 2004; Tingen et al., 2004; Young et al., 2002).
More than one of the above interventions should be utilized.	Combining interventions may increase likelihood of compliance with all 5As. The guideline suggests that full implementation of all 5As may produce superior results than partial implementation (Fiore et al., 2008)

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Delivery of Evidence-based Tobacco Use Interventions in Primary Care

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Abstract

Background: Improving the documentation and delivery of evidence-based tobacco use interventions in primary care is essential to increasing the number of successful smoking cessation attempts and reducing tobacco-related morbidity and mortality.

Purpose: The aim of this study was to identify the frequency with which primary care providers document implementation of tobacco use guideline interventions and evaluate the providers' perception of the value and effectiveness of providing education and feedback to them on the tobacco use guideline.

Methods: Data for this descriptive study were collected from a retrospective chart review and provider survey. Electronic medical records at a primary care clinic were reviewed to assess provider documentation of the first 3As of the 5A method described in the Public Health Service tobacco use and dependence guidelines. A provider survey assessing provider perceptions of an educational session and written feedback was distributed to four primary care providers.

Results: The study indicated that documentation of tobacco use interventions in one primary care clinic is poor and provision of education and feedback to providers had an overall favorable rating on their perceived motivation, knowledge, and confidence in intervening with tobacco users. Subjective findings from the study revealed several systems issues within the clinic including a lack of knowledge and skills among support staff, poor usability within the electronic medical record, and lack of a structured charting system.

Conclusion: Suggestions for improvement in the study clinic include adding tobacco use status to vital sign documentation, improving the electronic health record to include tobacco intervention decision support prompts, and adopting a clinic policy that addresses the process and expectation for tobacco use identification, intervention, and documentation. Future research should be directed at improving electronic health records to streamline and facilitate the documentation and implementation of tobacco cessation interventions. Research should also focus on specific educational and feedback components that improve adherence to tobacco use guidelines.

Delivery of Evidence-based Tobacco Use Interventions in Primary Care

Tobacco use cessation is a highly important public health issue as it is the only proven method to reduce the heavy economical and health-related burdens of tobacco use in the U.S. population. In a 2010 survey nearly 70% of smokers surveyed indicated a desire to quit smoking with over half reporting a quit attempt in the last year (CDC, 2011). However less than ten percent of surveyed smokers reported a successful smoking cessation attempt (CDC, 2011). Tobacco use cessation often requires multiple attempts and has shown to be more successful with the use of medication and counseling (Fiore et al., 2008).

It is essential that health care providers identify tobacco users and provide evidence-based treatment options for smoking cessation. Evidence demonstrates that health care provider interventions can have a positive impact on smoking cessation rates. A recent Cochrane review of studies involving over 31,000 smokers demonstrated a one to three percent increase in successful cessation at six month follow up after brief minimal advice from a physician (Stead et al., 2013). Additional meta-analyses have demonstrated physician advice to quit, including interventions lasting less than three minutes, increases abstinence rates (Fiore et al., 2008).

Clinical practice guidelines can assist providers in delivering evidence-based care when intervening with a tobacco user. In 2008, the Public Health Service published the clinical practice guideline *Treating Tobacco Use and Dependence: 2008 Update* which was developed to provide evidence-based recommendations on simple, adaptable interventions and treatments that health care providers can utilize in a variety of settings to help tobacco users overcome their addiction (Fiore et al., 2008). The guideline

recommends the use of the 5As method: *ask* about tobacco use, *advise* to quit, *assess* willingness to quit, *assist* in the quit attempt, and *arrange* follow-up (Fiore et al., 2008). According to the guideline the first 3As (ask, advise, and assess) should be utilized at every patient encounter. Despite evidence that this intervention is effective (Fiore et al., 2008; Gorin & Heck, 2004; Stead et al., 2008) performance of the 5A method is inconsistent. Studies have demonstrated varied rates of adherence to the 5A method with rates of asking between 62 to 90%, rates of advice between 20.9 to 89%, rates of assessment between 23 to 81%, rates of assistance between 7.6% to 76%, and rates of arranging follow up between 2 to 31% (Conroy et al., 2005a; Conroy et al., 2005b; Jamal, Dube, Malarcher, Shaw & Engstrom, 2012; Quinn et al., 2005). This wide range of delivery of the components of the 5As model may be partially attributed to poor documentation rates. Conroy et al. (2005a) noted that providers and patients both report higher rates of compliance with the guideline than is documented in the medical record. Despite the wide variability, it is evident that many tobacco users are not receiving the recommended assistance from their health care providers.

In order to improve adherence to tobacco use guideline recommendations, evidence-based interventions that increase delivery of the 5As model should be implemented. A recent meta-analysis found that multi-component interventions were most effective in increasing adherence to guideline recommendations and improving smoking cessation outcomes (Papadakis et al., 2010). Though it is uncertain which specific components lead to higher cessation rates, all multi-component intervention studies included in the meta-analysis provided clinician training. Provider training, alone or when combined with performance feedback, has been shown to be effective in improving documented

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rates of 5A delivery in the primary care setting (Andrews, Tingen, Waller, & Harper, 2001; Bentz et al., 2007; Carson et al., 2012; Fiore et al., 2008).

Evidence from the literature brings forth two main questions: How often are primary care providers delivering and documenting the components of the 5As model? If compliance with tobacco use guideline recommendations is lacking can provider feedback and a brief educational intervention improve provider knowledge, motivation, and confidence in regard to intervening with tobacco users? This study focused on the first 3As since the guideline recommends that every patient, regardless of reason for visit, be delivered the first 3As.

Objectives

The overall goal of the study was to aid primary care providers in identifying gaps in practice and ways in which they can improve the implementation of tobacco use guidelines. The first objective of this study was to identify the frequency with which primary care providers implement the first 3As (ask, advise, assess) as evidenced by chart documentation. The second objective was to evaluate the providers' perception of the value and effectiveness of written feedback based on chart review data and an educational session on the 5As model and tobacco use guideline.

Methods

The study followed a non-experimental descriptive design that was composed of two parts. The first part of the study was a retrospective chart review of electronic charts at a family practice clinic. Approximately 500-600 adult patients are seen at the clinic in a two week period. Therefore as recommended by the World Health Organization for quality improvement the principal investigator identified an approximate sample size of

127 charts (Agins, Seung, & Heiby, 2008). To obtain approximately 127 charts for review the principal investigator (PI) selected every fourth chart of patients seen at the clinic by a participating non-obstetrician/gynecologist (OB/GYN) primary care provider from July 29, 2013 to August 9, 2013. The PI then reviewed the patient's initial visit note and current visit note to assess for inclusion criteria, which consisted of age 18 and older and identified as a tobacco user. The initial visit note was defined as the first visit that was documented in the electronic health record. The current visit note was defined as the visit that occurred between July 29, 2013 and August 9, 2013. All electronic records that met inclusion criteria were included in data collection for the chart review.

Data was collected from the current visit note of all patients that met inclusion criteria (Appendix B). Demographic data such as age, gender, insurance, and race as well as date of visit, name of provider, and chief complaint was collected from the chart review. Type, length and amount of tobacco use was also documented. The chart review assessed if providers documented their implementation of the first 3As of the 5A method from the tobacco use guideline recommendations. All aspects of the note including chief complaint, history of present illness, social history, past medical history, assessment, and plan were examined for documentation of tobacco use and the first 3As of the 5A method. For example, if tobacco use was listed under social or past medical history, the PI documented this as the patient being asked about tobacco use.

The second part of the study occurred after the chart review. Primary care providers received written feedback and a brief educational intervention led by the principal investigator. Written feedback was given to the providers at the educational intervention and included an overview of chart review methods as well as a summary of the findings.

Feedback was not individualized by provider. The educational intervention lasted approximately sixty minutes and was conducted at the clinic during the providers' lunch hour in the clinic work room. Lunch was offered to providers by the PI for their participation.

The educational session was attended by four primary care providers as well as the office manager and the PI's faculty advisor. The session was led by the PI and briefly discussed the Tobacco Use and Dependence guideline, possible interventions that may increase compliance with the guideline, and resources available to patients and providers for treatment of tobacco use and dependence. The educational intervention was designed using Knowles' adult learning principles (Knowles, 1996) and followed a focus group format in which discussion and open dialogue among the providers was encouraged.

Each provider received a binder that contained the quick reference guide of the Tobacco Use and Dependence guideline, provider and patient resources from the Ask and Act program from the American Association of Family Physicians (AAFP), and a pharmacologic guide to FDA-approved medications for smoking cessation. The binder also contained information on documenting tobacco use and interventions in electronic health records as well as how to bill for tobacco use interventions and counseling. Most of the sixty minute educational intervention was spent reviewing the guideline's quick reference guide and the remaining time was spent reviewing and discussing the other components in the binder.

Immediately after the educational intervention an anonymous survey was given to the providers who attended the educational intervention (Appendix C). The survey assessed the providers' perception of the usefulness and effectiveness of the educational

intervention and performance feedback. The six item survey used a five point Likert

scale (1=*strongly disagree with statement* to 5=*strongly agree with statement*) to assess

whether providers agreed or disagreed with statements pertaining to the educational

intervention. All data collected from the chart review and the provider survey were

stored securely on the REDCap (Research Electronic Data Capture) account owned by

the principal investigator and hosted at the University of Kentucky. REDCap is a secure,

web-based application that is utilized for building, managing, and storing online surveys

and databases (Harris et al., 2009).

Results

A total of 141 patient charts were selected for the retrospective chart review. Of

these fifteen charts were excluded because the patient was under 18 years old and 29

charts were excluded because the patient was documented as a non-smoker. Eighty-one

charts (57%) did not have smoking status documented in the initial visit or current visit

note. Only sixteen charts were identified for further data collection. Of these, two

patients were documented as being ex-smokers but were included in the study because

the Tobacco Use and Dependence guideline stresses the importance of intervening with

current and former smokers (Figure 1).

The two patients documented as ex-smokers had an average age of 66 years old. One

of the patients was a female who had quit smoking nine years ago. The other patient was

a male who had quit smoking twenty years ago. Both of these patients were asked about

tobacco use during the current visit used for chart review. Since a number of years had

elapsed since these patients had quit using tobacco giving advice to quit and assessing

willingness to quit did not apply. Therefore inclusion of these patients in the chart review was only added to rates of tobacco use documentation (*ask*).

Figure 1: Chart Review Results
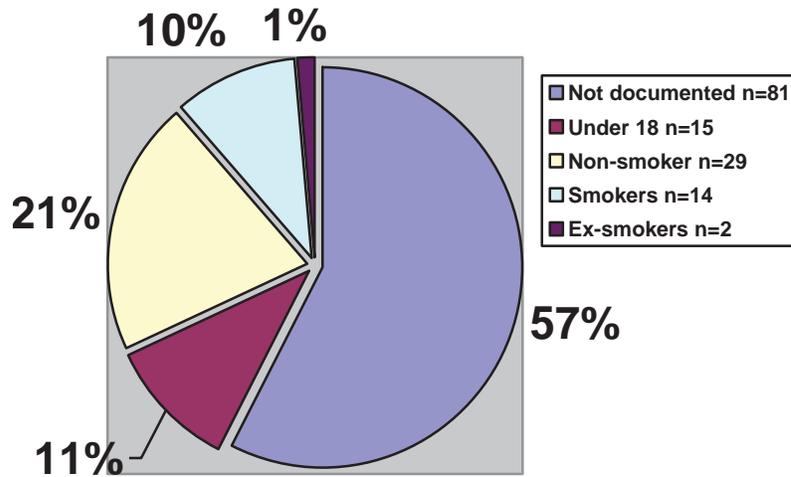
The average age of the fourteen documented current tobacco users was 50 years old and gender was evenly mixed (50% female, 50% male). Race was documented as white (35.7%) or unknown (64.3%). Race was obtained from the general clinic intake form and many patients did not provide racial or ethnic background information and therefore were documented as unknown. Patients included in the chart review were all insured by various private and public insurances. Chief complaints varied widely and included hypertension, depression and anxiety, sore throat and cough, dyspnea, itching, sexually transmitted disease check, ear infection, warts, yeast infection, insomnia, skin lesions, gynecological evaluation, and various complaints of pain.

Overall rates of documentation of the first 3As were poor. The rate of asking about tobacco use was 56.2% (n=16, includes ex-smokers mentioned previously), rate of giving advice was 14.3% (n=14), and rate of documenting willingness to quit was 7.1% (n=14) total. Six of the charts (42.9%) documented the type of tobacco used as cigarettes. Three

charts (21.4%) specified amount of use which varied from "a little less than 1/2 pack per day" to three packs per day. Only two charts (14.3%) had documentation of length of use (*years* and *since teenager*). Table 3 provides a summary of the data obtained from the chart review.

Table 3 Selected variables from retrospective chart review (N=14)

Variable	N	Outcome
Mean age in years	14	50
Gender		
Male	7	50%
Female	7	50%
Race		
White	5	35.7%
Unknown	9	64.3%
Documented type of tobacco use	6	42.9%
Documented length of tobacco use	2	14.3%
Documented amount of tobacco use	3	21.4%
Rates of asking*	9	56.2%
Rates of giving advice	2	14.3%
Rates of assessing willingness to quit	1	7.1%

*n=16, includes two ex-smokers who were asked about tobacco use during current visit

Three family practice physicians and one family nurse practitioner participated in the educational intervention. All providers who attended the intervention returned a provider survey. Table 4 contains the survey responses that were obtained following the educational intervention. Scores were highest for relevancy of the information presented in the session to the providers' practice (*M*=3.75). Scores were lowest for increased motivation to intervene with tobacco users and the session's ability to make providers think about the way they practice (*M*=3.25). There was a wide variation in the standard deviation as one provider rated the intervention poorly.

Table 4 Provider survey responses (n=4)

Variable	Mean response[a]	SD	Low	High
1. Information was relevant to practice	3.75	1.64	1	5
2. Session motivated me to intervene with tobacco users	3.25	0.83	2	4
3. Resources were useful	3.5	1.5	1	5
4. I feel confident intervening with tobacco users	3.5	1.5	1	5
5. Session expanded my knowledge	3.5	0.5	3	4
6. Educational session made me think about the way I practice	3.25	1.48	1	5

[a] Rating scale: 1=*strongly disagree with statement* to 5=*strongly agree with statement*

Several subjective findings emerged from the educational intervention. Providers stated support staff at the clinic were inadequately trained in tobacco use interventions. Support staff were not expected to ask about tobacco use when triaging or rooming the patient. Providers also mentioned lack of time, lack of usability within the electronic health record (EHR), lack of resources, and patient indifference as barriers to implementing and documenting tobacco use interventions.

Discussion

Delivery of tobacco use interventions in primary care is essential to reducing tobacco-related morbidity and mortality. Primary care providers are in a key position to intervene with tobacco users. Brief interventions with tobacco users are effective in increasing cessation attempts but are often not performed or documented (Fiore et al., 2008).

The first step in intervening with tobacco users is to identify them. This study demonstrated a poor identification rate of tobacco users. Over 57% of charts reviewed did not have smoking status documented. In 2009, the Health Information Technology for Economic and Clinical Health Act (HITECH) was established to provide incentives to

eligible providers for the adoption and use of EHR technology to capture health data, track clinical conditions, and coordinate care. The criteria for obtaining incentives for tobacco use status is more than 50 percent of patients aged 13 and older have smoking status recorded (AAFP, n.d.). Therefore this clinic is below the standards set by the HITECH act and would not qualify for incentives.

One possible explanation for inadequate documentation of the tobacco use status is the lack of training and involvement by support staff. Research has demonstrated that adding tobacco use status to vital sign attainment can improve tobacco use documentation (Milch, Edmunson, Beshansky, Griffith, & Selker, 2004; Piper et al., 2003; Rothemich et al., 2008; Szpunar, Williams, Dagroso, Engerg, & Chesney, 2006). Obtaining tobacco use status as an additional vital sign was not routine practice at the study clinic. Perhaps making this systems change would increase documentation of tobacco use status and thus improve overall implementation and documentation of tobacco use interventions.

Similar to previous studies (Conroy et al., 2005a) this study found documentation of delivery of the first 3As of the 5A model to be poor in electronic health records. Electronic health records have the potential to increase adherence to clinical practice guidelines through decision support (Chaudhry et al., 2006). Decision support usually includes computerized reminders that prompt clinicians to perform evidence-based interventions that pertain to their patients. A recent Cochrane review (Boyle, Solberg, & Fiore, 2011) found only a modest improvement in documentation of smoking status and referral to cessation counseling following implementation of the expectation to utilize the EHR to record and treat tobacco use. Future research should be directed at pinpointing

ways in which EHRs can be effectively utilized to increase adherence to clinical practice guidelines such as the tobacco use guideline.

Providers in this study voiced concerns about the usability of their EHR to document tobacco use interventions. The clinic was utilizing the "out of the box" or basic EHR software package from their selected EHR company. This version did not include any tobacco-use related decision support such as prompts or reminders to provide tobacco use interventions. Investing in a software upgrade that includes clinical decision support and computerized prompts may increase implementation of tobacco use and other preventive health care interventions at this clinic.

Evidence has suggested that providing training and feedback to health care staff including physicians and nurse practitioners can improve implementation of tobacco use interventions (Andrews, Tingen, Waller, & Harper, 2001; Bentz et al., 2007; Carson et al., 2012). Though mean scores of provider survey items were mediocre, most providers rated the educational session favorably. Scores were highest for relevancy of information to the providers' practice which may indicate that the providers in this study view tobacco use interventions as an important aspect of primary care. However scores for motivation and changing the way providers think about the way they practice were lowest. Providers may feel lack of motivation to change practice due to systems barriers.

In a recent synthesis of systematic reviews, Prior, Guerin, and Grimmer-Somers (2008) found that academic detailing and interactive education are superior strategies over passive dissemination and didactic education in improving clinical practice guideline implementation. Though efforts were made during the educational session to obtain input and feedback from the providers perhaps the educational session should have

been designed with a more interactive approach such as incorporation of role playing exercises and case scenarios.

Future interventions to increase provider compliance with tobacco use guidelines should promote provider input, involve support staff, and incorporate system changes that support tobacco use interventions. Adoption of policies that outline the appropriate process and expectations for implementation of tobacco use interventions is critical in any primary care clinic. For example, the policy should clarify what health care team member is responsible for documentation of smoking status and the correct method for documentation.

Limitations

A major limitation to this quality improvement study is the lack of follow-up. An additional chart review following the educational session may have demonstrated improved documentation rates of tobacco use interventions. Continued engagement and support may have aided the providers in implementing necessary systems changes that facilitate tobacco use interventions. It is also difficult to discern the overall effect of the educational intervention since there was a small sample size and no pretest was administered. If a survey or test had been administered prior to the educational intervention and then compared to the survey administered after the intervention it may have demonstrated some improvements in the provider's attitudes and perceptions pertaining to tobacco use interventions.

Conclusion

Clinical practice guidelines are valuable tools for clinicians to provide evidence-based, safe, quality care. The clinical practice guideline, *Treating Tobacco Use and*

*Dependenc*e (Fiore et al., 2008), recommends utilizing the 5As approach when intervening with tobacco users. However this intervention is inadequately documented and implemented in primary care (Conroy et al., 2005a; Conroy et al., 2005b; Jamal et al., 2012; Quinn et al., 2005). This study demonstrated poor documentation of tobacco use interventions in one primary care clinic. The provider educational intervention in this study had mixed results but demonstrated overall favorable ratings for perceived provider knowledge, motivation, confidence, and attitudes as they relate to intervening with tobacco users.

The lack of documentation of tobacco use interventions in the study clinic may be due to larger systems barriers such as EHR usability issues, support staff knowledge and skills, and lack of resources and time. Primary care practices should individualize and adopt system changes that promote the adoption of tobacco use interventions. Specifically all primary care clinics should institute a chart labeling system that aids support staff and providers in the identification of tobacco users. Charting systems, whether traditional paper method or electronic records, should be examined for usability issues and feature decision support systems such as reminders and prompts to intervene with tobacco users. Education of staff and providers on guideline recommendations should be interactive and engaging.

Future research should be directed at improving EHRs to streamline and facilitate the documentation and implementation of preventive health care, including tobacco cessation. Research should also focus on specific educational and feedback components that improve adherence to tobacco use guidelines. Continued efforts to implement

tobacco use interventions in primary care is an essential public health function that can greatly improve health outcomes.

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Capstone Report Conclusion

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Conclusion

The first manuscript details a critical analysis of the Public Health Service guideline on *Treating Tobacco Use and Dependence*. The analysis demonstrated that the guideline is a valid, evidence-based resource for clinicians to use when intervening with tobacco users. The guideline gives practical, specific recommendations that can be used by a variety of health care providers in a wide range of health care settings. One of the major recommendations of the guideline is use of the 5As of smoking cessation. Health care providers should *ask* their patients about tobacco use, *assess* their willingness to quit, *advise* them to quit, *assist* in their quit attempt, and *arrange* follow-up care.

Despite evidence that use of the 5As is effective in increasing smoking cessation rates it is often underutilized by health care providers (Fiore et al., 2008). The second manuscript discusses interventions that increase provider compliance with guideline recommendations, specifically using the 5A method. The literature review revealed that multi-component interventions are most effective in increasing utilization of the 5A method. Use of a vital sign stamp or computerized prompt and provision of provider education and feedback appear to be effective interventions in improving rates of 5A delivery in the primary care setting.

The third manuscript details a descriptive study of the documentation and implementation of tobacco use interventions in a primary care setting. The study demonstrated that documentation rates of tobacco use interventions, specifically the first three of the 5As, were poor. An educational intervention that provided written feedback to providers did not demonstrate a clear benefit in the confidence, motivation, or knowledge of the providers as it relates to intervening with tobacco users. However, the

intervention did reveal some potential systems issues that may have contributed to the poor documentation and implementation of tobacco use interventions at the clinic. Providers cited lack of resources and time, poor design of the electronic health record, and inadequate training of support staff as barriers to implementation of tobacco use resources.

The first key step in assisting tobacco users with cessation is to identify them at every health care visit. Evidence has demonstrated that adding tobacco use status to vital signs has greatly improved the recognition of and subsequent intervention with tobacco users. Primary care clinics, such as the clinic in which the study was conducted, that do not have policies and procedures in place to identify tobacco users should implement this important step.

Electronic health records can aid primary care clinicians in providing preventive health care, including tobacco cessation, by providing prompts and utilizing clinical decision support systems. Primary care providers should encourage administrators and information technology staff to purchase, install, and update electronic health record programs that incorporate user-friendly decision support systems. Adequate training and support should be given to providers on proper use of the electronic health record. Policies should be enacted that clearly detail documentation expectations of all health care staff.

The 5As method of smoking cessation is a brief, evidence-based intervention that can be easily utilized by primary care providers. By providing education and feedback and promoting a clinic environment in which implementing tobacco use interventions is encouraged and facilitated, primary care providers can successfully help their patients

quit. Smokers typically make multiple quit attempts prior to successfully quitting. Therefore it is essential that health care providers identify tobacco users and provide evidence-based interventions that promote cessation. By utilizing clinical practice guidelines and recognizing important systems issues within a clinic, primary care providers can make a significant impact in their patient population of tobacco users.

Appendix A

Brief Summary of Guideline Recommendations

Clinical Interventions

Every health care provider should identify and intervene with tobacco users using the first 3 of the 5As (ask about tobacco use, assess willingness to quit, and advise all users to quit). Asking about tobacco use should be done in a systematic way, such as with vital signs, to ensure that every patient at every visit has tobacco use status assessed and documented (Fiore et al., 2008). Screening for tobacco use will result in one of four scenarios:

    1. A current tobacco user unwilling to quit

    2. A current tobacco user willing to quit

    3. A former tobacco user

    4. An individual that has never regularly used tobacco

For individuals that have never regularly used tobacco products or who have quit using tobacco products, continued abstinence should be encouraged. For current users, the clinician should advise the patient to quit in a clear, personalized, and strong manner (Fiore et al., 2008). If the patient is willing to quit the clinician should assist the individual in his or her quit attempt by helping the patient develop a quit plan, recommend the use of approved medications, and provide practical counseling, intratreatment social support, and supplementary materials. The clinician should arrange for frequent follow up during the patient's quit attempt (Fiore et al., 2008).

All smokers trying to quit should be offered approved medication unless contraindicated or for populations in which insufficient evidence exists for the

effectiveness of the medication (e.g. pregnant women, adolescents, light smokers).

Approved medications include bupropion SR, nicotine gum, nicotine lozenge, nicotine

nasal spray, nicotine patch, and varenicline (Fiore et al., 2008). The guideline provides

information about the clinical use of each of these medications.

Counseling is an effective treatment method for smoking cessation, both alone

and in combination with pharmacologic treatment. All clinicians can provide basic

practical counseling by helping the patient to recognize triggers or danger situations and

to develop coping skills (Fiore et al., 2008). Danger situations may include stress,

alcohol, or being around others that use tobacco. Coping skills may include lifestyle

changes that reduce stress or cognitive strategies that improve mood (Fiore et al., 2008).

Providers can also provide social support through encouragement and caring, giving

supplemental information such as quit-line brochures, and discussing basic information

about quitting.

For current tobacco users that are unwilling to make a quit attempt, clinicians

should use motivational interventions based on the principles of motivational

interviewing (MI) to move the patient closer to making a quit attempt. The general

principles of MI are express empathy, develop discrepancy, roll with resistance, and

support self-efficacy (Fiore et al, 2008). The guideline gives examples of using each of

these principles to motivate tobacco users towards a quit attempt. The guideline also

discusses the 5R's to enhance motivation to quit. The 5R's are relevance, risks, rewards,

roadblocks, and repetition. Providers should encourage patients to discuss why quitting

smoking or tobacco products is personally relevant to them. Providers should aid patients

in identifying negative consequences of tobacco use (risks), potential benefits of quitting

(rewards), and possible barriers to quitting (roadblocks). These motivational interventions should be repeated at every clinic visit at which the patient expresses no interest in making a quit attempt (Fiore et al., 2008).

For smokers or tobacco users who have recently quit providers should congratulate the patient and use open-ended questions to explore topics relevant to quitting tobacco. Topics that can be discussed include the benefits of quitting, success the patient has had in quitting, barriers to continued abstinence, and medication related information. All patients that have recently quit should receive follow up care for continued assistance and support (Fiore et al., 2008).

The guideline also recommends more intensive interventions by specially trained clinicians in the treatment of tobacco use and dependence. State tobacco quit lines (1-800-QUIT-NOW) provide intensive specialist-delivered interventions and can be utilized easily by all tobacco users (Fiore et al., 2008). The guideline discusses in detail components of intensive interventions and how specialists may contribute to tobacco control efforts.

System interventions

Health care administrators, purchasers, and insurers should ensure that institutional changes are made that promote tobacco use dependence interventions and treatments systematically and universally. Strategies that might facilitate these interventions include implementation of a tobacco user identification system in every clinic, provision of adequate training and resources to staff, dedicating staff to provide tobacco dependence treatment, promoting hospital policies that support and provide tobacco dependence services, and including all effective treatments (counseling and

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medications) as covered or paid services for all members of health insurance packages (Fiore et al., 2008).

Expanding the vital signs to include tobacco use status is the recommended approach to ensure universal, system-wide identification of tobacco users. All healthcare providers should be given education, resources, and feedback that promote the provision of tobacco use dependence interventions and treatment (Fiore et al., 2008). All clinics should designate a tobacco dependence treatment coordinator and communicate to other staff their responsibilities in the delivery of tobacco dependence services. All hospitals should have policies in place that ensure every tobacco user admitted to the hospital is offered tobacco dependence treatment. Evidence-based tobacco use treatments, including medication and counseling, should be included as part of the basic benefits package for all health insurances without barriers such as co-pays or prior authorizations (Fiore et al., 2008).

Conclusion

Overall the guideline stresses that tobacco use is a chronic disease that requires multiple interventions and attempts to quit. Therefore it is essential that every health care provider assess tobacco use status and use evidence-based tobacco dependence treatment to assist users in their quit attempts. Tobacco dependence treatments are clinically effective and cost-effective and should be supported and promoted by health care providers as well as insurers, purchasers, and health care administrators.

Study ID _____

Inclusion criteria

o   Yes

o   No

Age (years) _____

Race

o   American Indian/Alaska Native

o   Asian

o   Native Hawaiian or Other Pacific Islander

o   Black or African American

o   White

o   More Than One Race

o   Unknown / Not Reported

Gender

o   Female

o   Male

Insurance _____

Date of visit _____

Provider _____

Chief complaint _____

ASK

o   Yes

o   No

ASSESS

o   Yes

o   No

ADVICE

o   Yes

o   No

Length of use _____

Amount _____

Type of tobacco

o   cigarette

- o cigar
- o smokeless tobacco
- o other
- o unknown

Comments _____

Appendix C
Provider Survey

This survey pertains to an educational session you attended on the Tobacco Use and Dependence Guidelines. Please respond to the following items to the best of your ability.

1. *The information presented in the session was relevant to my practice*

1	2	3	4	5
Strongly Disagree				Strongly Agree

2. *The educational session motivated me to intervene with tobacco users I see in clinic*

1	2	3	4	5
Strongly Disagree				Strongly Agree

3. *Resources (pamphlets, websites, etc.) given during the educational session were useful.*

1	2	3	4	5
Strongly Disagree				Strongly Agree

4. *After the educational session, I feel confident intervening with tobacco users.*

1	2	3	4	5
Strongly Disagree				Strongly Agree

5. *The educational session expanded my knowledge on evidence-based ways to help my patients overcome tobacco addiction.*

1	2	3	4	5
Strongly Disagree				Strongly Agree

6. *The educational session made me think about the way I practice.*

1	2	3	4	5
Strongly Disagree				Strongly Agree

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