

The Mixed Evidence for Brief Intervention in Emergency Departments, Trauma Care Centers, and Inpatient Hospital Settings: What Should We Do?

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Background: This qualitative review is based on a symposia presented at the 2009 annual conference of the Research Society on Alcoholism (Baird et al., 2009; Field et al., 2009; Monti et al., 2009; Saitz et al., 2009a). The purpose is to describe the mixed evidence supporting brief interventions in the emergency department, trauma care, and in-patient medical care settings; examine potential moderators of treatment outcome in light of the mixed evidence; and identify methods to move the research and practice of brief interventions beyond their current state.

Methods: By drawing upon existing reviews and selected individual studies, we provide examples that reflect the current complexity of research in this area and propose steps for advancing the field.

Results: Emergency departments, inpatient hospital settings, and trauma care settings represent three unique contexts within which brief interventions have been tested. While the general efficacy of brief alcohol interventions in these settings has been recognized, the evidence is increasingly mixed. Recent studies investigating potential moderators of treatment outcomes suggest that a more sophisticated approach to evaluating the effectiveness of brief interventions across varying patient populations is needed to further understand its effectiveness.

Conclusions: Current dissemination efforts represent a significant advance in broadening the base of treatment for alcohol problems by providing an evidence-based intervention in health care settings and should not be curtailed. However, additional research is required to enhance treatment outcomes, refine current practice guidelines, and continue to bridge the gap between science and practice. Given the current state of research, a multisetting clinical trial is recommended to account for potential contextual differences while controlling for study design.

Key Words: Brief Intervention, Emergency Departments, Inpatient Hospital Settings, Review, Trauma Centers.

THE PURPOSE OF this qualitative review of the scientific literature on brief intervention is to (i) describe the mixed evidence supporting brief interventions in the emergency department, trauma care, and inpatient medical care settings; (ii) examine potential moderators of treatment

outcome in light of the mixed evidence; and (iii) identify methods to move the research and practice of brief interventions beyond their current state. The intent is not to carry out a systematic review or meta-analysis of screening and brief intervention. Rather, the aim is to draw upon existing reviews and selected individual studies to provide examples that reflect the current complexity of research in this area and propose steps for advancing the field. The review is a product of a symposium presented at the 2009 annual conference of the Research Society on Alcoholism (Baird et al., 2009; Field et al., 2009; Monti et al., 2009; Saitz et al., 2009a,b), which focused on the moderating factors of brief interventions provided to adults in the emergency department, trauma care setting, and inpatient hospital setting.

Emergency departments, inpatient hospital settings, and trauma care settings represent 3 unique contexts within which brief interventions have been tested. In emergency departments, physicians provide care to patients with acute medical and surgical problems including injuries. Emergency department patients with more severe conditions are admitted to the hospital for inpatient care. Inpatient acute care hospital settings are staffed by doctors in medical and surgical specialties and serve a range of patients with diverse acute illnesses and

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chronic comorbidities. Trauma centers are staffed by trauma surgeons and coexist with emergency departments and other inpatient hospital settings but have a separate accreditation process from emergency departments and hospitals. Trauma centers provide care to severely injured patients most of whom are hospitalized following acute medical treatment for the trauma. This qualitative review distinguishes between these settings given the different contexts in which brief intervention is provided and the differences in patient characteristics presenting to these medical settings. The overarching characteristic these contexts have in common is that they are appropriate settings for opportunistic interventions. Opportunistic interventions are provided to patients with at-risk drinking, alcohol abuse, or dependence who are not seeking treatment for alcohol problems, *per se*. Brief opportunistic interventions are short, face-to-face conversations regarding drinking, motivation to change, and options for change which are provided during a window of opportunity or potentially teachable moment occasioned by a medical event.

THE CASE FOR BRIEF INTERVENTION

Previous studies have demonstrated the general effectiveness of BI for alcohol problems among patients with trauma. For example, Gentilello and colleagues (1999) showed that adult injured patients with moderate alcohol problems who received BI after being admitted to a Level 1 trauma center decreased alcohol consumption significantly at 12 months, although there was substantial loss to follow-up. Gentilello and colleagues (1999) also observed a statistically nonsignificant reduction in injury requiring treatment in the emergency department or readmission to the trauma center. In an adjusted analysis, Schermer and colleagues (2006) determined that BI significantly reduced arrests for driving under the influence of alcohol (DUI) at 3-year follow-up such that for every 9 interventions provided, there was a reduction in 1 DUI arrest. Finally, Gentilello and colleagues (2005) conducted a cost-benefit analysis based, in part, on the efficacy data of the original clinical trial (Gentilello et al., 1999) and found that for every dollar spent, there was \$3.81 saved in direct injury-related medical costs. Therefore, if BI were offered to every eligible injured person in the United States, the resulting savings from health care costs alone would be approximately \$1.82 billion annually. On the basis of this evidence, the American College of Surgeons (ACS) mandated that all Level I and Level II trauma centers have a mechanism to identify patients with alcohol problems, and all Level I trauma centers have a mechanism to provide an intervention for patients identified as problem drinkers (Committee on Trauma, 2006). Coinciding with the ACS mandate, the evidence for the efficacy of BI in the trauma care setting became increasingly mixed.

In one of the earliest randomized controlled trials of BI conducted with adult emergency department patients, Longabaugh and colleagues (2001) showed that patients who received the BI in the ED along with a follow-up booster BI

showed a significant decrease in alcohol-related negative consequences compared to a standard care group. However, there was no significant difference in reduction between the group receiving a single BI and the standard care group nor were there significant reductions in drinking associated with the BI with booster. More recently, in a quasi-experimental, nonrandomized study, the Academic ED SBIRT (Screening, Brief Intervention and Referral to Treatment in the Emergency Department) Collaborative reported a short-term reduction of 3.25 drinks per week versus controls across 14 ED sites, with 28% of the intervention group no longer exceeding drinking guidelines versus 18% of controls (Academic ED SBIRT Research Collaborative, 2007). In contrast, Daepfen and colleagues (2007), in a randomized trial that included a BI group and 2 control conditions (assessment only and no assessment), found no differential reduction between these 3 groups in terms of alcohol use or health care utilization. Another large randomized trial (D'Onofrio et al., 2008) also showed no significant differences in average volume per week or binge drinking episodes. It is worth noting that both of these negative studies had high follow-up rates. In conclusion, results of research on brief intervention in the emergency department setting are no less ambiguous than those conducted in the trauma center.

A recent review of 14 studies of brief intervention concluded that, in general, there was an effect of brief intervention on reduced alcohol consumption, hazardous use of alcohol, and alcohol-related injuries in comparison with usual emergency department care (Nilsen et al., 2008). However, 5 of the 14 studies found no effect of brief intervention on these outcomes, and even among the studies that found a treatment effect, the BI did not influence similar outcomes. That is, studies that reported a significant effect of BI tended to report either a reduction in alcohol consumption or a reduction in alcohol-related negative consequences, but not both. In almost all of these studies, the control or standard care group also showed decreases in either alcohol consumption or alcohol-related negative consequences that was either coincident with or related to the ED visit.

The general lack of consistency among studies regarding the effectiveness of BI in emergency and trauma departments or the nonspecific effect that BI has on varied alcohol-related outcomes raises questions about the optimal application of BI in these settings. While a substantial amount of research pertaining to the effectiveness of brief intervention has accumulated, inconsistencies in results and the potential impact of various moderators remain unreconciled. Moderators that may be related to patient characteristics, treatment dosing or fidelity factors, or site specific factors (e.g., the context for the intervention) may eliminate, attenuate, or amplify the effects of BI. Future research exploring these aspects may help determine what types of interventions are most effective and what types of patients benefit most. This research would enhance the overall effectiveness of these strategies and/or targeting of interventions to patients who are most likely to benefit.

MODERATORS AFFECTING TREATMENT OUTCOMES: THE USUAL SUSPECTS

One potential explanation for the mixed findings discussed earlier is that, while brief intervention is sometimes effective, certain patient and/or setting characteristics (i.e., context bound effects) are moderators of treatment outcomes following brief interventions. By moderators, we not only mean variation in levels of treatment (e.g., amount or intensity) or in other aspects of treatment (e.g., differences in intervention components or context) but also in participants' predispositions. These cannot be randomized but have to be statistically accounted for as potential sources of variation in treatment outcomes. In a recent systematic review, Nilsen and colleagues (2008) pointed out that moderator analyses of BI effectiveness for reducing alcohol use or alcohol-related negative consequences among trauma or emergency department patients have been empirically evaluated in too few studies to allow for definitive conclusions regarding their influence. However, a number of recent studies have begun to explore potential moderators of treatment outcome following brief intervention in the emergency department.

Monti and colleagues (2009) recently reported differences in treatment outcomes among patients with higher initial motivation to change and those recruited from a trauma unit (in contradistinction to those recruited from emergency department). These patients showed greater reductions in drinking and alcohol-related consequences, but they were not moderators of brief intervention. In their evaluation of moderating effects, Barnett and colleagues (2010) found that drinking at the time of the injury and attribution of the injury to alcohol moderated intervention effects. Participants who were not drinking prior to their injury and those with low or medium attributions and received brief intervention showed lower alcohol use at 12-month follow-up. In contrast, those who were drinking at the time of their injury and those high in attribution did not show intervention group differences in alcohol use. In contrast, Walton and colleagues (2008) found that patients who received intervention and attributed their injury to alcohol use drank less and had fewer heavy drinking episodes than those who made no attribution of their injury to their alcohol use.

While these studies represent significant strides, they are perhaps no more definitive than studies regarding the main effect of brief intervention. As a result, research on moderators remains essential because, given the mixed findings regarding the main effects of brief intervention, it is essential to delineate subgroups of patients who may differentially benefit from brief intervention. For this review, we have chosen to focus on 2 commonly investigated moderators including severity of alcohol problems and readiness to change. The results of studies examining moderators of behavior change and the mixed findings from these studies further illustrate the challenge of reaching definitive conclusions from existing studies.

Readiness to change alcohol use and severity of alcohol problems have been the most commonly evaluated moderators in studies of BI. Walton and colleagues (2008) found that readiness to change alcohol use and self-efficacy for changing drinking behavior did not moderate effects of BI on alcohol consumption among adult emergency department patients. In contrast, Barnett and colleagues (2010) found that patients in the emergency department with low or medium readiness to change (vs. high) did evidence greater reductions in alcohol use after receiving BI. But, in the inpatient hospital setting, readiness did not appear to moderate the effects of brief intervention (Saitz et al., 2009a,b). Stein and colleagues (2009), in a secondary analysis of the data from the Longabaugh and colleagues (2001) study, found that readiness mediated the effect of treatment on alcohol-related consequences only for those highly motivated to change prior to the intervention but not for those with low pre-intervention motivation. Thus, the observed treatment effect on drinking-related consequences was due, in part, because it helped enhance or maintain readiness to change among those already highly motivated to change. Given that the BI in the Longabaugh study was based on the principles of motivational interviewing, which is intended to increase patient motivation change, the findings of Stein and colleagues (2009) are counterintuitive because ED patients who were less motivated to change (vs. those highly motivated to change) did not benefit from brief intervention. As both Longabaugh and colleagues (2001) and Stein and colleagues (2009) note, a BI delivered in the ED to nontreatment seeking patients may in itself lack the robustness to instigate change without some pre-existing recognition for the need and desire to change alcohol use behaviors among this patient population.

With regard to alcohol severity, a recent study conducted in the trauma care setting by Field and Caetano (2010) determined that brief intervention was effective among admitted injured patients who met DSM-IV criteria for alcohol dependence. This finding is noteworthy because BI has generally been targeted toward nondependent drinkers with the assumption that it was less effective among patients with alcohol dependence. Based on these clinical recommendations, many studies have included indicators of alcohol dependence (e.g., recent history of substance abuse treatment or prior diagnosis) as exclusion criteria. As a result, the findings from Field and Caetano (2010) are particularly important because they may help shed light on recent null findings (most notably, Daeppen et al., 2007; Soderstrom et al., 2007 and Sommers et al., 2006) from well-designed studies that excluded participants who were most likely to meet criteria for alcohol dependence. Mello and colleagues (2008) reporting on the 3-month results from a randomized control trial in which injured emergency department patients received standard care or 2 telephone BI's, found that only those patients who received BI and who had the most severe baseline alcohol scores (as mea-

sured by an Alcohol Use Disorders Identification Test or AUDIT score of 8 or more) showed significant reductions in alcohol-impaired driving. In contrast to the findings of Field and Caetano (2010) and Mello and colleagues (2008), Saitz and colleagues (2009a,b) recently reported that brief intervention was associated with improved outcomes among nondependent drinkers but not among those with alcohol dependence.

These initial studies of potential moderators suggest that BI may not be universally effective across settings and contexts, and that the medical care setting of a hospital emergency department, trauma center, or medical inpatient setting may differ from one another. For example, in the emergency department, there may be numerous interruptions to provide medical care. This may be the reason why Longabaugh found that to produce treatment effects, the participants needed to have received a booster session that took place outside of the emergency department. In contrast, the inpatient setting may present fewer interruptions, but the severity of the patient's medical condition, particularly among patients with trauma, may be a limiting factor to the provision of brief intervention. In addition to the provider's ability to conduct brief intervention, the severity of the medical condition may also influence the patient's receptivity to brief intervention. For example, brief intervention in the trauma department or emergency department may be more effective than inpatient hospital settings because of the saliency of the medical event. Alternatively, the saliency of the event may obviate the need for BI if the medical event itself is sufficient to prompt self-change. In general, differences with regard to findings pertaining to moderating effects may also be a function of different inclusion criteria, intervention conditions, differences in patient population (e.g., age, race/ethnicity, socioeconomic status etc.), or other methodological differences between the studies.

One common criticism of brief intervention studies conducted in the trauma care setting is the apparent inability to account for the impact of the injury event on subsequent drinking behavior. Mello and colleagues (2005) investigated type of injury as a potential moderator and found that brief intervention was effective among those in a motor vehicle collision as opposed to other unintentional or intentional injuries. However, this does not account for the psychological impact of the injury per se that may vary within patients from a particular setting and across treatment contexts. For example, some medical inpatients may have continued to drink despite the development of a symptomatic condition that leads to hospitalization, while others may be provided care for medical problems unassociated with their drinking. Thus, patient receptivity to brief intervention may also vary across hospital settings. Additional efforts to account for individual differences in response to the medical event are particularly important because patient characteristics and context factors may help explain the differential effectiveness of brief intervention across various medical settings.

WHAT IS BRIEF INTERVENTION IN THE MEDICAL SETTING?

While studies in diverse patient populations increase generalizability, the variation in setting and patient population across studies may be an important piece of the puzzle which is often disregarded in systematic reviews, meta-analyses and commentaries or editorials, which attempt to synthesize the results of studies conducted across medical settings as if they were uniform. Nilsen and colleagues (2008) noted that the studies included in their systematic review were conducted in 3 types of medical settings including outpatient emergency departments, inpatient hospitals or trauma centers, and outpatient clinics. This, in and of itself, creates significant problems in terms of deriving general statements about the effectiveness of BI and condensing the results of these studies to yield definitive conclusions. This is due in part because patient characteristics and contextual factors may influence the effectiveness of brief interventions. A meaningful synthesis of current studies also requires greater uniformity in the use of brief intervention, a common approach for identifying patients who receive brief intervention, and increased similarity in both operationalizing and measuring outcomes and consistency in statistical approaches for analyzing those outcomes (Nilsen et al., 2008). Given fundamental differences in these methodologies, we are far from being able to reach definitive conclusions based on the current body of research.

The research on brief intervention in the medical care setting also conflates several distinct types of interventions. For example, brief advice, brief intervention, and brief interventions with multiple visits are all referred to as brief intervention. In a recent meta-analysis of brief intervention in the emergency department setting, 14 studies were identified for inclusion (Moyer et al., 2002). Ten studies evaluated a single session, 8 incorporated principles of motivational interviewing, and 8 provided a handout that included generic advice, personalized advice or feedback based on blood alcohol concentration at the time of admission. In studies that reported the length of the session, the length of the session varied from 5 to 60 minutes. Six studies reported that for the majority of participants, the intervention took place in the emergency department; 2 reported that the majority of sessions took place on an outpatient basis, and 2 studies reported that missed participants were scheduled to return for a visit, and 2 did not indicate the location of the intervention. Beich and colleagues (2003), Emmen and colleagues (2004), and Nilsen and colleagues (2008) reported similar variability in duration, approach, content as well as target population and provider characteristics. As noted by Nilsen and colleagues (2008), the general lack of methodological detail in many studies of brief intervention makes it difficult to discern whether 1 treatment approach or a range of treatment approaches is being evaluated.

While efforts to standardize brief interventions are essential to ongoing research and dissemination, 1 approach for addressing differences in intervention protocols across studies

is to test the underlying theory of brief intervention. Apodaca and Longabaugh (2009), in a recent meta-analysis, evaluated the results of 19 studies and found that limited attention had been given to testing the underlying theory. The most consistent evidence found during their review was that client change talk and client experience of discrepancy were related to better outcomes, and clinician behavior inconsistent with motivational interviewing was related to worse outcomes. Furthermore, the use of a decisional balance exercise showed the strongest association with better outcomes. This initial review of early evidence pertaining to mechanisms of change may provide a starting point for future research investigating the active ingredients and mechanisms of behavior change underlying brief interventions in various medical settings.

RESEARCH ON BRIEF INTERVENTION: NEITHER HERE NOR THERE

Clinical trials are often categorized as either efficacy or effectiveness research that generally focuses on either internal or external validity, respectively. Advancement in clinical research typically proceeds from establishing efficacy in well-controlled clinical trials to testing the generalizability of those findings in effectiveness trials. More recently, alternative conceptualizations to this dichotomy have emerged. Specifically, the terms hybrid research, translational research, practical or pragmatic trials have emerged as similar concepts reflecting the merging of efficacy and effectiveness trials (Woolf, 2008). Brief interventions in the medical setting reflect the shades of gray in hybrid research. Hybrid trials attempt to control some of the parameters that affect outcome while allowing others to vary (Carroll and Rounsaville, 2003). On the one hand, clinical trials of brief intervention in medical settings, including the emergency department and trauma center, have well-established procedures for ensuring adherence to the study protocol such as standardized screening procedures, clearly defined inclusion and exclusion criteria, treatment protocol manuals and ensuring that those conducting assessments are blind to treatment condition. On the other hand, these clinical trials have involved a wide range of patients recruited from diverse settings to evaluate multiple outcomes of interest and diverse approaches to BI. To refer to BI in these settings as either efficacy or effectiveness studies is a misnomer that fails to capture the complexity of conducting clinical trials in these settings.

With regard to behavioral trials including brief intervention in the medical setting, the spectrum may be better reflected by the framework described by Westfall and colleagues (2007). These authors describe a continuum of research that includes hybrid research as a stage beyond efficacy and effectiveness research but prior to implementation and dissemination. Between these stages of research development, Westfall and colleagues (2007) describe practice-based research, which is necessary before distilled knowledge can effectively be put into practice. Such research focuses on how beneficial and cost effective the treatment is in practice as well as questions

about the optimal application and use of the treatment or intervention. This type of research more accurately reflects the challenge of conducting research on brief interventions in medical settings and reaching definitive conclusions regarding their effectiveness. In short, an efficacy study is an unachievable ideal in the medical setting and additional trials to attempt to establish the efficacy of brief intervention in various medical setting without accounting for differences in the treatment context and unique patient characteristics are unlikely to resolve current discrepancies in findings. In addition to testing BI in specific contexts, what is needed is a more sophisticated approach to determining when and how brief intervention is effective in an effort to enhance positive treatment outcomes in various patient populations identified as at-risk drinkers in different treatment contexts.

THEN WHAT SHOULD WE DO? DO NOT THROW THE BABY OUT WITH THE BATHWATER

While not precluding continuing efforts to implement screening and brief intervention, the emergence of mixed evidence should lead to a more careful consideration of the potential strengths and limitations of brief interventions from a research perspective. Given the hybrid nature of the research, highly controlled efficacy trials are not feasible in the emergency department, trauma care, and inpatient medical settings. To date, most studies of brief intervention have evaluated the general effectiveness of brief intervention and have supported the view that some patients do benefit from this approach to reduce at-risk drinking and its consequences. While such studies are an essential first step, similar investigations in the future are unlikely to clarify current ambiguities in the research. For future research to enhance the current knowledge base addressing differences in effects of BI, a systematic approach to evaluating effectiveness is required to continue to support and enhance efforts to effectively implement this evidence-based intervention strategy and to confidently advocate for its widespread dissemination in various medical settings.

As represented in this brief review, research on screening and brief intervention in the medical setting is undoubtedly in a transition period. The current status of research on brief interventions is by no means unique in the investigation of behavioral interventions (see for example, Crits-Christoph, 1997; Kendall, 1998; and Rounsaville and Carroll, 2002). For instance, in Longabaugh and Morgenstern's reviews of cognitive behavioral therapy (CBT), they noted that numerous studies failed to identify which components of CBT accounted for its effectiveness and that many more studies suggested that CBT's effectiveness was limited to specific treatment contexts or specific patient subgroups (Longabaugh and Morgenstern, 1999; Morgenstern and Longabaugh, 2000). Similarly, the most likely explanation for the mixed evidence reported herein is that brief intervention sometimes reduces alcohol use and its associated consequences among certain types of patients in particular treatment contexts.

The mixed results may be a function of the heterogeneity in the patient population, the characteristics of the intervention itself, the setting in which they are provided or differences in research methodology across studies. While single-site randomized trials currently being conducted will undoubtedly prove informative and further enhance the current knowledge base, they are unlikely to disentangle the issues discussed in this qualitative review. Nevertheless, existing research can help determine a path for building on current knowledge to clarify remaining ambiguities. To date, only peripheral or post hoc consideration has been given to the components of the intervention, which are most effective, the therapeutic processes that lead to improved outcomes, the characteristics of patients who respond most favorably to intervention, and contextual factors that may influence the effectiveness of brief intervention. Studies of these factors may help determine if and when these interventions should be offered and thus have important clinical implications that will guide clinical practice and ensure the efficient use of limited resources by targeting patients who are most likely to benefit from intervention and referral for treatment.

A POTENTIAL SOLUTION: ONE PROTOCOL TO RULE THEM ALL

To continue making progress in our understanding of the effectiveness of brief interventions and ensure ongoing dissemination efforts, a more refined approach to its evaluation is required. This review identified 3 core factors which may be influencing our ability to reach definitive conclusions. These include the context in which the intervention is being carried out, the characteristics of patients within these contexts and research methodology including the intervention protocol, measurement, and statistical analysis of data. Traditionally a multisite is considered beneficial, when multiple single-site RCT's are inconclusive because there is sufficient heterogeneity among their results and incongruity in study procedures (Kraemer, 2000). Multisite trials are particularly useful when initial positive findings from well-designed studies are not consistently replicated (Weinberger et al., 2001). A multisite trial would confer numerous benefits above and beyond the current body of single-site studies but would introduce site as a potential confounder to interpreting the findings. Thus, a large multisite trial may not yet be warranted and may not resolve current discrepancies in findings.

An alternative approach to advancing this line of research is to conduct a single-site, multisetting trial of brief intervention. Such a study might further establish the effectiveness of brief intervention, investigate its effectiveness across settings, begin to account for potential moderators unique to the medical setting and differences in patient population, and explore the underlying mechanisms of change. This novel approach would have the advantage of utilizing a single-study methodology, which would standardize the inclusion/

exclusion criteria, intervention protocol, assessment procedures, and statistical analysis of the findings. Based on current research, such a study should carefully assess patient characteristics that may influence the effectiveness of brief intervention. Furthermore, the study should also formally test the theoretical mechanism of change underlying brief intervention based on motivational interviewing. Finally, a process evaluation and organizational assessment may help characterize differences between the emergency department, trauma care, and inpatient medical setting, which may influence the delivery of brief intervention and its effectiveness in these settings. Differences between these contexts are perhaps the most difficult and least often studied aspect of conducting behavioral interventions in medical settings. This nontraditional approach to behavioral research may help resolve some of the current discrepancies highlighted in this review by standardizing study procedures across settings and addressing the most likely factors accounting for variations in study findings.

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