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An Economic Evaluation of Primary Care Behavioral Health in Pediatrics: A Case Study

A dissertation

presented to

the faculty of the Department of Psychology

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Doctor of Philosophy in Psychology

by

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August 2013

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ABSTRACT

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by

Natasha Benfield Gouge

A barrier cited by primary care administrators in integrating behavioral health is financial risk. Fee-for-service billing mechanisms remain complex and there is little empirical guidance on cost-effective models. This study was an economic evaluation of an integrated care model in a pediatric private practice clinic. The study evaluated cost benefits by examining specific delivery indices such as concerns presented, time spent, billing codes used, and reimbursement received in regards to pediatric primary care visits by comparing days when an on-site Behavioral Health Consultant (BHC) was available versus Non-BHC Days. All 3 hypotheses were supported: 1) more patients were seen in clinic on BHC Days; 2) more revenue was generated on BHC Days; and 3) incorporation of the BHC was cost-effective. Findings showed that time saved by having a BHC onsite increased provider productivity, resulting in an additional \$1,142 in revenue generated on a BHC Day when compared to a Non-BHC Day.

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CHAPTER 1

INTRODUCTION

It has been estimated that more individuals with mental health and behavioral problems are seen in primary care than in the mental health sector (Regier, Goldberg, & Taube, 1978), and the prevalence of childhood psychosocial concerns in primary care is well-established with estimates from national samples ranging from 10% to 21% (Jellinek et al., 1999; McInerney, Szilagyi, Childs, Wasserman, & Kelleher, 2000; Palermo et al., 2002; Wasserman et al., 1999). However, a number of specific barriers limit the treatment of psychosocial concerns in pediatrics. Specifically, children remain undiagnosed and untreated due to: 1) difficulties inherent in providing services in primary care settings such as physicians' lack of time and training (Perrin & Stancin, 2002) and 2) poor patient follow-through with referrals to outside mental health specialists (Kazdin, 1996). Consequently, a majority of children with significant mental health concerns do not receive the services they need (US Public Health Service, 2000).

Studies of integrated services have shown positive outcomes such as increasing physician knowledge and confidence in addressing behavioral health concerns, improving access to services and treatment adherence, decreasing medical costs, and improving patient and provider satisfaction (e.g., AAP, 2009; Gray, Brody, & Johnson, 2005; Williams, Shore, & Foy, 2006). Yet, the barriers to the implementation of integrated care often overshadow the benefits. Such barriers include lack of organization or leadership, a lack of willingness to collaborate, minimal time to develop integrated programming, and most often, a lack of funding mechanisms to make integrated programming sustainable (Drotar, 1995).

One of the most critical trends contributing to the fiscal challenges of the field of mental and behavioral health is that the portion of the health care funding pie spent on behavioral health services is shrinking despite the fact that more people are receiving mental health treatment than in the past. Further, integrated care settings can put behavioral health clinicians at a disadvantage when it comes to reimbursement (Kessler, 2008), often due to restrictions on same-day specialty payments. Although there is evidence that integrated care in general is clinically effective and cost-effective, both improving outcomes and reducing medical costs (Kessler, 2008), little is known about the effect on pediatric practices. It is essential to show that the implementation of primary care behavioral health *at least* increases effectiveness of care and may save costs overall (Blount et al., 2007). Unfortunately, many psychologists have limited interest and little formal training in business, health care financing, and the major economic contexts for practice, making it especially difficult to overcome the fiscal barriers (Cummings & O'Donohue, 2008).

Psychologists working in integrated care settings are particularly well positioned to use evidence to increase effective practice and blaze a trail for more applied economically focused research. However, for this potential to be realized, psychologists will need to use their scientist-practitioner training to demonstrate effectiveness through evaluation and economic focused outcomes. This study was an economic evaluation of an integrated care model in a rural, pediatric private practice clinic. Specifically, the study was an evaluation of the cost benefits by examining specific service delivery indices (i.e., presenting concerns, time spent, billing codes) and revenue generated on

days when an on-site Behavioral Health Consultant (BHC) was available versus days the BHC was not present.

The following discussion includes a brief introduction to the professions of pediatrics and psychology and how they overlap, followed by literature supporting the rationale for integrated health care within pediatric settings. An overview of integration models and barriers to integration development is also addressed. Finally, a discussion of the economics of integrated health care, terminology within health economics, and the need for more applied economically minded research follows.

Introduction to Professionals

Pediatrics

Pediatrics is a health care practice devoted to the comprehensive, long-term care of children between birth and 18 years of age. Pediatricians are considered to be primary care physicians due to the in-depth knowledge of childhood growth and development required, but they are also regarded as specialists due to the specific age range of patients seen (Korsch, Chen, & Lewis, 2004). The field of pediatrics developed fairly recently, around the latter half of the 19th century, (Drotar, 1995) and is not consistently available, especially in rural areas (Randolph & Pathman, 2001).

Health care needs addressed by pediatricians continue to evolve. The focus of care has broadened from infant nutrition, infectious disease, and preventative to encompass children's developmental, social, emotional, mental health, and behavioral needs (e.g., Briggs-Gowan, Carter, Skuban, & Horwitz, 2001; Korsch et al., 2004). Conditions such as adolescent depression, Attention Deficit Hyperactivity Disorder (ADHD), and developmental disabilities such as mental retardation and cerebral palsy are

among the most common chronic impairments that pediatricians must address. It has been estimated that the management of chronic pediatric disorders approached \$12 billion per year within the last decade (Ringel & Sturm, 2001).

As early as 1951 the American Board of Pediatrics recognized the need to enhance training in the developmental and behavioral aspects of pediatrics, and this need has been echoed in subsequent training program agendas (Tarnowski, 1991). Throughout the 1970s and 1980s the idea of developmental and behavioral pediatrics (DBP) as formal discipline began to take shape, and the Society for Developmental Pediatrics in 1978, followed by the Society for Behavioral Pediatrics in 1982, were among the first attempts to breed specialized pediatricians with a focus on DBP (Drotar, 1995). To date, all pediatric residency training programs are required to offer a 30-day DBP rotation during the 3-year training period in accordance with the Accreditation Council for Graduate Medical Education (ACGME). Further, the American Academy of Pediatrics (AAP) has promoted the adoption of guidelines to address a variety of mental and medical health overlap concerns such as ADHD, Autism, anxiety, depression, and substance abuse within pediatric populations (Policy Statement, 2009).

In addition to the incorporation of DBP, the field of Pediatrics was the first to suggest the centralization of patient records, now a widely adopted concept known as “medical home.” Specifically, in the 1970s the medical home was promoted by the AAP for children with chronic diseases to coordinate the complex array of physicians and specialists seen to maintain their healthcare (Sia, Tonniges, Osterhus, & Taba, 2004). As the medical home concept evolved and gained greater recognition nationally, the need for a medical home for all children became apparent; further, dozens of other healthcare

specialties continue to follow suit.

Today, the medical home is known as the “patient-centered medical home” (PCMH), orienting physicians to practice in such a way that patients’ needs are addressed (such as by making it easier for patients to access care) and by more actively coordinating with other providers to manage all aspects of a patient’s care. The AAP includes these characteristics to describe its goal of patient centered-medical home: accessible, continuous, comprehensive, family-centered, coordinated, compassionate, and culturally effective care (AAP, 2007). The model also typically involves relying more on a team-based approach to delivering care to maximize efficiency and take advantage of the different team members’ professional skills (Berenson, Devers, & Burton, 2011). As such, pediatric patient centered medical home characteristics fit nicely with the notion of integrated care. The health economics of the PCMH are discussed in a subsequent section.

Clinical Child and Adolescent Psychology

The American Psychological Association (APA) describes clinical child and adolescent psychology as a specialty of professional psychology which brings together the basic tenets of clinical psychology with a thorough background in child, adolescent and family development and developmental psychopathology (Society of Clinical and Adolescent Psychology, 2013). Clinical child and adolescent psychologists conduct scientific research and provide psychological services to infants, toddlers, children, and adolescents and are focused on understanding, preventing, diagnosing, and treating psychological, cognitive, emotional, developmental, behavioral, and family problems of children. Of particular importance to clinical child and adolescent psychologists is a

scientific understanding of the basic psychological needs of children and adolescents and how the family and other social contexts influence socio-emotional adjustment, cognitive development, behavioral adaptation, and health status of children and adolescents (Society of Clinical and Adolescent Psychology, 2013). As such, clinical child and adolescent psychologists specialize in psychopathology that occurs before adulthood.

Pediatric Psychology

Pediatric psychology is a specialty field of science and practice in which evidence-based methods are applied within the context of pediatric health (Society of Pediatric Psychology, 2013). Areas of expertise can be wide-ranging within the field and may include, but are not limited to: “psychosocial, developmental and contextual factors contributing to the etiology, course and outcome of pediatric medical conditions; assessment and treatment of behavioral and emotional concomitants of illness, injury, and developmental disorders; prevention of illness and injury; promotion of health and health-related behaviors; education, training and mentoring of psychologists and providers of medical care; improvement of health care delivery systems and advocacy for public policy that serves the needs of children, adolescents, and their families” (American Psychological Association, 2013, “Society of Pediatric Psychology”, para. 2). As such, pediatric psychologists tend to specialize in emerging psychosocial problems related to pediatric health rather than clinical psychopathology.

Due to the psychosocial nature of problems seen in pediatric primary care, an increased focus on DBP, and a desire for a more comprehensive collaborative health care approach through patient centered-medical home, the integration of mental health professionals into pediatrics emerged, albeit rather slowly. Although the earliest report of

collaboration between psychology and medical education was documented by the APA in 1911 (Fernberger, 1932), only recently have the professions established collaborative health care models. Renowned developmental psychologist Jerome Kagan proposed in 1965 that the relationship between psychology and pediatrics be “nothing less than a marriage” (Drotar, 1995; pp. 15). Since Kagan’s address at the Massachusetts General Hospital in Boston on the topic, the professions of psychology and pediatric primary care have continued to trend towards one another (Drotar, 1995). According to Rodrigue (1994) the collaboration between clinical child psychologists, developmental psychologists, and pediatricians began more formally in the 1970s, and this forged the formative years of pediatric psychology (Peterson & Harbeck, 1988; Roberts, 1986) which has long been committed to collaborative care.

Rationale for Integrated Care

De facto Mental Health Provider

Primary care has been identified as the chief delivery setting for child mental health care nationwide (Kelleher, McInerney, Gardner, Childs, & Wasserman, 2000). Pediatricians are the first professionals to come in contact with families with young children and are in the unique position of evaluating children at regular intervals over time (Tarnowski, 1991). Reports indicate that pediatricians spend considerable time (25% to 60%) in well-child care where the focus is on anticipatory guidance, assessment of developmental progress, and identification and treatment of behavior problems (e.g., Brazelton, 1975). Primary care settings are in the position to encounter the majority of patient-physician interactions consisting of *emerging* clinical problems (i.e., problems that do not yet meet DSM-IV criteria for psychiatric disorders) and are positioned to

provide preventative efforts and early intervention before psychopathology progresses (AAP, 2009).

It is estimated that more individuals with mental health and behavioral problems are seen in the primary care than in the mental health sector (Regier et al., 1978). The prevalence of childhood psychosocial concerns in primary care is well-established with estimates from national samples ranging from 10% to 21% (Jellinek et al., 1999; McInerny et al., 2000; Palermo et al., 2002; Wasserman et al., 1999). Lavigne et al. (1996) estimated prevalence rates for young children ages 2-5 years enrolled in primary care to be 21.4% for all disorders and 9.1% for severe disorders.

Such concerns in very early childhood, without proper guidance or intervention, are associated with increasing behavior problems throughout childhood and psychopathology that often persists into adolescence and adulthood (e.g., Anda et al., 2007; Frick & Lonely, 1999; Hofstra, Ende, & Verhulst, 2002). Further, pediatric behavior problems have been shown to have extensive negative impacts across settings such as home, school, with peers, and during public outings. These negative outcomes can result in social costs related to potential school dropout rates, unemployment, family breakdown, drug and alcohol use, and/or increased delinquent or risky behaviors (Barlow & Stewart, 2000).

Overlap of Medical and Mental Health

The difficulty of disentangling psychosocial and medical or physical phenomena lends support to a biopsychosocial model of care. It has been estimated that 70%-75% of all medical problems presenting in primary care are a result of, or exacerbated by, psychosocial variables (Mori, LoCastro, Grace, & Costello, 1999; Strosahl, 1997).

Psychologically distressed individuals experience more physical symptoms (Katon et al., 1990), and patients with more significant or pronounced physical symptoms are more likely to have a psychological diagnosis (Kroenke et al., 1994). For example, Gortmaker, Walker, Weitzman, and Sobol (1990) reported that rates of psychological problems in children with chronic illness were 1.5 times greater than in children without such health difficulties. Likewise, there is evidence that children with developmental or behavioral concerns have increased probability of seeking services in medical clinics compared to those without such problems (Costello, 1986).

According to deGruy (1997) when mental and physical problems are dichotomized, this leads to “a misconceived and incomplete clinical reality that produces duplication of effort, undermines the comprehensiveness of care, hamstring clinicians with incomplete data, and insures that the patient cannot be completely understood” (p.4). As such, overuse of medical care, economic burden, and dissatisfaction for both the patient and provider can occur.

Barriers to Mental Health Care

A number of specific barriers limit the treatment of psychosocial concerns in pediatrics. Specifically, children remain undiagnosed and untreated due to: 1) difficulties inherent in providing services in primary care settings such as physicians’ lack of time and training (Perrin & Stancin, 2002) and 2) poor patient follow-through with referrals to outside mental health specialists (Kazdin, 1996). Consequently, a majority of children with significant mental health concerns do not receive the services they need (US Public Health Service, 2000).

Time. Data indicate that at least half of pediatric appointments for approximately 35% of acute visits, 67% of chronic visits, and 43% of well-child visits result in behavioral health related discussions, which causes an addition of approximately 5-7 unanticipated minutes to each appointment (Cooper, Valleley, Polaha, Begeny, & Evans, 2006). However, for pediatric residents the cost is higher. In one study behavior concerns raised caused an average increase of 10 additional minutes per visit (Gouge, Polaha, & Powers, in preparation). The pressure to see a high volume of patients in a short amount of time presents several challenges including: behavioral health concerns being inadequately addressed; discussion of unanticipated behavioral health concerns negatively impacting time allotted for other patient visits; and/or a decrease in the number of patient visits scheduled per day, impacting clinic revenue and patient care.

Training. As mentioned previously, pediatric residency training programs are required to offer a 30-day developmental and behavioral pediatrics (DBP) rotation during the 3-year training period. However, a 30-day rotation may not be sufficient to address the wide range of objectives laid out by the ACGME (AAP, 2009; Horwitz et al., 2010; Leigh, Stewart, & Mallios, 2006b). Further, only 12% of residents report being interested in DBP rotations and 28% of residents indicate their vacation time is strategically scheduled during DBP rotations, resulting in a sizeable portion of residents indicating they are likely to only receive 2-3 weeks of DBP training during their 3-year residency (AAP, 2009; Horwitz et al., 2010). This is problematic because findings show DBP training duration is positively related to self-rated competence and training satisfaction among residents (Horwitz, 2010; Leigh, Stewart, & Mallios, 2006a). Surveys collected in 2001-2002 among all accredited residency programs in pediatrics revealed that 85% of

training directors described their DBP training as minimal or suboptimal, with 70% of residents desiring additional behavioral health training that incorporates more diversity of venues, formats, and teachers beyond the faculty's DBP rotation (Leigh et al., 2006b).

Patient Resistance. Patients may be reluctant to report mental health issues to their doctor, perhaps deeming this information irrelevant in the context of a medical visit (Mechanic, 1997). In one study 70% of mothers visiting pediatricians reported primary concern related to development, behavior, or emotional issues regarding their children; however, only 28% voiced their concerns during their visit (Mechanic, 1997). In a managed care system, when employers shift insurance plans and doctors move among plans, there may be less continuity in doctor-patient relationships over time, which discourages patients from disclosing and doctors from knowing patients well enough to identify problems (Mechanic, 1997). Further, patient resistance occurs due to stigma of mental diagnosis and care (e.g., deGruy, 1997) and parent role expectations within the context of the pediatric visit (e.g., Enlow, 2011).

Referrals. Pediatricians are challenged to provide behavioral health services in their daily practice; however, outcomes are no better when developmental, behavioral, or psychosocial concerns identified in primary care are referred to specialty mental health. In a study by Hacker et al. (2006), pediatricians used an evidence-based rating scale to identify such concerns; however, only 17% of patients who scored above the cutoff and were referred for mental health services actually attended their first appointment.

A Possible Solution. In sum, primary care is the de facto mental health provider, but is not equipped to address mental health concerns due to many barriers such as lack of time, inadequate training, low reimbursement, and patient resistance. At the same time

referral show rates to mental health specialists outside of primary care are very low. Many have argued that the optimal way to address this “crisis” is to incorporate mental health services into pediatric primary care settings (e.g., Stancin, Perrin, & Ramirez, 2009; Tolan & Dodge, 2005).

Integrated pediatric practice is not a new concept, with demonstration projects dating 3 decades (Schroeder,1999). Over the past 10-15 years, however, integrated care has gained more momentum in pediatrics and more demonstration projects have been published (e.g., Sobel, Roberts, Rayfield, Barnard, & Rapoff, 2001; Valleley et al., 2007). Moreover, the American Academy of Child and Adolescent Psychiatry (AACAP) and the AAP released a paper in 2009 stating that identification, assessment, and treatment of behavioral health needs should occur within the child’s familiar primary care setting; coocation of pediatric behavioral health providers was recommended to facilitate this process.

Studies of integrated services have shown positive outcomes such as increasing physician knowledge and confidence in addressing behavioral health concerns, improving access to services and treatment adherence, decreasing medical costs, and improving patient and provider satisfaction (e.g., AAP, 2009; Gray et al., 2005; Williams et al., 2006). Valleley et al. (2007) reported that when the behavioral health service was located within primary care patient follow-through with referral was 81%. Additionally, having a behavioral health professional readily available may decrease the time demand on physicians by offering immediate access to specialty behavioral health services (Gouge et al., in preparation).

In addition to providing behavioral health services to patients with identified behavioral health needs, the integrated model holds promise in improving prevention and early intervention during wellness visits. The frequency and regularity of these visits during the first 5 years of life creates an opportunity to systematically assess and treat developmental, psychosocial, and behavioral health concerns in young children. Moreover, these visits occur during a time in which rapid development results in frequent and wide ranging behavioral challenges for parents around feeding, sleep, toileting, disruptive, and noncompliant behavior (Cooper et al., 2006; Polaha, Volkmer, & Valleley, 2007). In one study direct observation of 93 wellness visits found nearly one quarter of all visits included a discussion of psychosocial concerns (Cooper et al., 2006).

Models of Integration

A hallmark of an integrated approach incorporating psychologists is the use of interventions that may be delivered in a very brief time period and without the benefit of a traditional comprehensive diagnostic evaluation (Rodrigue, 1994). In the context of primary care there is a premium on the development and refinement of techniques that are briefly implemented, economical, and demonstrably effective (Roberts, 1986). Finney, Riley, and Cataldo (1991) demonstrated that brief targeted therapy in a primary care setting (for children with common behavior, toilet, school, and psychosomatic problems) decreases medical care use. Furthermore, a number of innovative models have demonstrated increasingly sophisticated services for the pediatric primary care population in a way that is both effective and efficient (e.g., Polaha et al., 2007; Sanders, 1999).

Pediatric Collaboration Models

Models specific to integrated pediatric care have been described (Drotar, 1995; Friman, 2008; Schroeder, 1999) and range from distinct but well-coordinated practices to comprehensively integrated service provision. An important aspect to integrated primary care is that it is a highly innovative endeavor that seeks novel applications of the two fields (i.e., primary care and psychology) to solve multi-faceted patient concerns.

Independent Functions Model. The independent functions model is quite similar to general medical consultation models, whereby the pediatrician consults with specific professionals as needed on a case-by-case basis. In this model the psychologist provides diagnosis and treatment as needed to patients referred by a pediatrician, with communication or collaboration between professionals occurring only briefly before and after the referral (Drotar, 1995). In general both professionals have familiarity with this model and it requires low levels of contact between service providers. Disadvantages to this approach include limited communication, relationships, and consultation accuracy (Stabler & Murray, 1973); lack of opportunity for teaching opportunities and discussion of collaborative patient care (Stabler, 1988); and low show rates to psychological providers once the pediatrician has made the referral (Hacker et al., 2006). Further, such collaboration can make meeting patient centered-medical home goals challenging due to gaps in service, documentation, and/or communication between psychologists and pediatricians.

Indirect Consultation Model. The indirect consultation model, also known as the process-educative model (Stabler, 1979), allows for the pediatricians to retain sole responsibility for the clinical management of their patients and allows the psychologist to

assume the role of teacher or consultant (Roberts, 1986). In this model, the patient is not referred to the psychologist, rather, the pediatrician seeks advice specific to psychological concerns (i.e., “is this typical development for this age?”, “what would you recommend for a child who presents with...?”, “could you explain this disorder to me?”). These types of consults may take place in the hallway, via phone or email, or during didactic lectures or case conferences (Drotar, 1995). Although this approach may avoid problems with no show rates for outside referrals, it can be very time consuming for both professionals and can produce high frustration among both professionals, particularly when the patient’s case is quite complex (Drotar, 1983, 1995). As such, indirect consultation as a sole means of integrated care is not often utilized.

Collaborative Team Model. Another model of consultation is the collaborative team model in which shared responsibility and joint decision making among psychologists and pediatricians occurs within a team-approach setting (Roberts, 1986). Perhaps the most desirable collaborative team model is one in which Strosahl (1998) describes a “population-based approach,” where behavioral health services “keep pace” with the volume and variety in primary care. In this model psychologists work as consultants to physicians, providing brief (20-30 minute), evidence-based interventions to individual patients and groups with a particular concern. Psychologists are available at all times (i.e., can be interrupted) to take “warm hand-offs” (i.e., on-the-spot referrals) from physicians who identify relevant concerns in the context of patient visit.

The AACAP and the AAP (2009) advocate for a collaborative team model stating that identification, assessment, and treatment of behavioral health needs should occur within the child’s familiar primary care setting and colocation of pediatric behavioral

health providers has been recommended to facilitate this process. As mentioned previously, integrating behavioral health services into primary care settings has resulted in positive outcomes such as increasing physician knowledge and confidence in addressing behavioral health concerns, improving access to services and treatment adherence, decreasing medical costs, and improving patient and provider satisfaction (e.g., AAP, 2009; Gray et al., 2005; Williams et al., 2006). Additionally, having a behavioral health professional readily available may decrease the behavioral health time demand by offering immediate access to specialty behavioral health services that can be outside the scope of training, interest, and/or time available to physicians. Further, this level of collaboration addresses many disadvantages to previous models such as increasing collaboration and communication between professionals, decreasing the gap of knowledge between professionals about patient care, facilitating educational experiences among professionals, increasing access to services, and eliminating off-site referral issues. Despite these advantages, however, developing a successful collaborative team model can be especially challenging.

Barriers to the Implementation of Integrated Care

Barriers to the implementation of integrated care among professionals include lack of organization or leadership, a lack of willingness to collaborate, minimal time to develop integrated programming, and a lack of funding mechanisms to make integrated programming sustainable (Drotar, 1995). To date most well-established integrated programs have developed in settings where professionals take care of a very specific population within the same health care system (e.g., HMOs, Departments of Family Medicine, the Air Force and other branches of the military, and the Veterans

Administration).

Such unified systems are quite rare across the country however, making integration even more challenging (Walker & Collins, 2009). One reason is that the health care system in the United States is not designed to foster the development, implementation, and/or maintenance of integrated services. Specifically, the fee-for-service model facilitates reimbursement for performing medical procedures or diagnostic tests and little, if any, for prevention, communicating with other providers, and/or coordinating care (Walker & Collins, 2009). In addition, behavioral and mental health services have not yet achieved parity with “physical” health despite significant efforts to bring about this change. As a result, behavioral and mental health factors are often ignored clinically and “carved out” financially, resulting in fragmented, poor-quality, and more-expensive care. This, combined with misaligned financial incentives, often leads to insurmountable barriers for those attempting to develop any type of integrated care program (Walker & Collins, 2009).

Cunningham (2009) reported impediments to integrated care access that included insufficient numbers of mental health providers, health insurance plan barriers, and poor or no coverage for mental health services. Health care and behavioral health care continue to be bifurcated into separate systems and separate settings throughout much of health care to the detriment of both consumers and professionals and resulting in inefficient, costly systems and untreated behavioral health problems (Goodheart, 2010; Kautz, Mauch, & Smith, 2008).

Fiscal Challenges

One of the most critical trends contributing to the fiscal challenges of the field of mental and behavioral health is that the portion of the health care funding pie spent on behavioral health services is shrinking despite the fact that more people are receiving mental health treatment than in the past. From 1970 to 2003 the percentage of the gross domestic product of the United States spent on medical health increased from 7% to 15.8%, whereas the percentage for mental health remained essentially flat at less than 1% (Goodheart, 2010). Patterson, Peek, Heinrich, Bischoff, and Scherger (2002) stress that the world of health care is really three simultaneous worlds including the clinical, operational, and financial, and that unless daily practice is strategically designed to incorporate the views of all three worlds problems result.

In about a third of studies on general integrated care there is a demonstrated reduction of medical costs (Blount et al., 2007; Chiles, Lambert, & Hatch, 1999). However, Kessler (2008) argues:

“...what is needed are administrative and financial methods geared directly to the difference between behavioral health care positioned as a mental health specialty in community based care, and behavioral care positioned as part of a medical team focused on medical problems. Without shifting the financial dimension along with the clinical dimension, collaborative medical behavioral health care becomes difficult to sustain. It remains very difficult to track the new services, their outcomes or their impact on utilization and costs of medical care. This is crucial if this effort is going to be taken seriously by policymakers and payers. Until then,

behavioral health practitioners in medical settings remain a somewhat expendable add on” (pg. 208).

Developing a fiscal model that “fits” primary care behavioral health (PCBH) requires more than simply finding ways to use existing psychiatric Current Procedural Terminology (CPT) codes in primary care. Optimally, behavioral health consultants (BHC) in primary care will provide different types of services than they might in a traditional mental health setting. Specifically, a BHC might provide psychological treatments to medical patients who have no “diagnosable mental disorder”, which is not captured in the traditional mandated billing codes (Kessler, 2008). Also, much of what psychologists provide in integrated care includes collaboration, feedback, and consultation. Although these contributions are valuable, they are not reimbursed in the current system (Kessler, 2008).

In an attempt to better accommodate an integrated care model, the Health and Behavior Codes were recently introduced for the assessment and treatment of medical patients with behavioral concerns that do not meet criteria for a psychiatric diagnosis. For example, frequent and wide ranging behavioral challenges for parents around feeding, sleep, toileting, disruptive, and noncompliant behavior are ripe for prevention and early intervention efforts within primary care clinics (Cooper et al., 2006; Polaha et al., 2007) and do not meet criteria for psychiatric diagnoses. The Health and Behavior Codes allow for a psychologist to address such behavioral concerns and promote the spirit of integration. Significantly, the Health and Behavior Codes allow payment for the service of a psychologist (at this time master’s level therapists may not use this code) and are funded from the medical rather than behavioral health budgets (Kessler, 2008). This

element demonstrates an important step toward the structural alignment of incentives for collaborating (Goldberg, 1999).

The Health and Behavior Codes have not been a panacea for integrated care. In 2001, the year before the Codes' adoption, the only insurer to reimburse for the codes nationally was Medicare, which represented a very low 7% of billings for behavioral health services (Mark, 2005) and only occurred in certain regions throughout the country. It was not until 2006 that 100% of all of the National Medicare programs regional subcontractors began funding the codes in some form or other. Regulations regarding eligibility for reimbursement using the Health and Behavior Codes are highly variable between states and contracted insurance plans. Further, there is no available database to identify eligible providers in other insurance programs because it is not known which carriers approve the codes (Kessler, 2008). A reflection of this is found in a 2005 survey of members of clinical divisions of the APA (Delamater, 2005). This study found 25% of respondents reported receiving no reimbursement when billing for services under the Health and Behavior Codes; 39% reported 25%– 50% reimbursement; 11% reported 51%– 75%, and only 25% reported getting 76 %–100% reimbursement. In addition, over 70% of denials were due to “use of medical diagnosis by a behavioral health practitioner,” which is precisely why the codes were developed--reflecting insurance companies' insufficient knowledge of the utility of the codes. Until there are more structural changes in the relationship between commercial insurers and carve out organizations, the utility of the codes will be limited (Kessler, 2008).

Ideally, the coming changes inherit among accountable care organizations (ACO) will make these tricky fee-for-service mechanisms a thing of the past, but the widespread

acceptance of this dramatic health care shift has been slow moving. ACO models have been promoted as a way to level the playing fields among health care professionals by shifting the focus from dollars earned through sick-care to a perspective in which dollars saved through well-care can be valued and reimbursed with overall payment rates and incentives for health care organizations. Implementing an ACO model can be costly at the front-end, however, and requires substantial top-down buy in among administrators within collaborative organizations (DeVore & Champion, 2011).

The good news is that public policies are growing in support of ACO models. And clinicians within primary care behavioral health will eventually be better positioned for reimbursement based on value-driven models of payment rather than fee-for-service payments solely. As such, it is all the more important and timely to begin better understanding the economics of behavioral health services.

Economics of Behavioral Health Care

Cummings, O'Donohue, and Cummings (2009) make a bold statement: “integrated behavioral/primary care is like a pomegranate: overwhelmingly people say they like it, but few buy it” (pg. 6). The need for more “buy in” within the current health care climate ultimately requires demonstrations that the introduction of collaborating behavioral health staff *at least* increases effectiveness of care and may save costs overall (Blount et al., 2007). Historically, the field of psychology has demonstrated limited interest and little formal training in business, health care financing, and the major economic contexts for practice, making it especially difficult to overcome the fiscal barriers described above (Cummings & O'Donohue, 2008). Thus, the field is challenged to impact the economic factors and systems that can influence the practice and sustainable psychological services

(Goodheart, 2010). Goodheart (2010) argues that we must become more fluent in “psychology economics” as there are specific economic concepts that play an important role in public policy decision making.

For example, cost effectiveness studies reviewed by Kaplan and Groessl (2002) support the supposition that psychological interventions in behavioral medicine settings provide a cost benefit, a cost utility benefit, and a cost offset. These are important terms for policy makers, but few psychologists are able to describe their meaning or incorporate them into clinical practice and research to provide economic information needed to secure alternative funding mechanisms for integrated care (Kaplan & Groessl, 2002).

Conceptualizing Areas for Cost Savings

Blount et al. (2007) reviewed the evidence and suggest the most promising area for cost savings lies in meeting the unmet behavioral health needs that people bring to their primary care physicians. Kroenke and Mangelsdorff (1989) suggest that less than 20% of visits to primary care for problems with organic causes, but that only 10% are purely psychological in nature, which supports the notion that behavioral health problems, not identified mental health disorders, drive the majority of visits to primary care settings and are often manifested as physical symptoms (Unutzer, Schoenbaum, Druss, & Katon, 2006). Because the majority of individuals do not seek mental health treatment in traditional settings, and few behavioral health specialists are in the primary care settings, patients’ needs are often unmet, primary care physicians are overburdened, and the cost is higher than necessary. Such a scenario seems ripe for economic evaluation. Further, a particular area of health care intervention that may yield significant and cost effective health gains is health promotion and prevention (Goodheart, 2010).

Even in the best integrated and collaborative systems of care, the persistent economic challenge is how to provide “medically necessary” services at the lowest possible cost (Tovian, 2004). Psychologists are well poised to meet that challenge so long as proper evaluation and treatment standards are not gutted by cost cutting denials of payment for needed behavioral health services and research (Goodheart, 2010).

When applied to pediatric practice, integrated models have the potential to maximize the evidence-based technology that has evolved in the fields of pediatric and child clinical psychology. Many professionals recognize the utility of integrated practice for addressing traditional mental health concerns in children such as depression, anxiety, or conduct problems; however, this one-dimensional view severely under uses the range of potential applications in primary care behavioral health within pediatrics. In fact, this growing field, characterized by empiricism, is well positioned to make a broad contribution to children’s health (Friman, 2008).

Within the tightening health care economy noted earlier, payers seek ways to gain efficiencies that allow them to make decisions about funding for services (Goodheart, 2010). A major initiative throughout health care, including behavioral health care, is a drive for accountability and quality. Psychologists need to take advantage of their scientific training and clinical positions within primary care clinics to grow the applied research base so that theory can be translated into practice and ultimately data translated into more feasible funding mechanisms that can be applied to real world settings. In other words, we need to move beyond efficaciousness into effectiveness trials so that findings can be disseminated and implemented within our communities (See Appendix A, Heyman & Slep, 2009).

Study Aim

This study was an economic evaluation of an integrated care model in a pediatric private practice clinic in which the primary goal was to assess how using a part-time BHC impacts clinic revenue. This study does not account for treatment outcomes, quality of interventions, or patient quality of life; thus, we focus on evaluating cost benefits in order to determine average “cost effectiveness”. In this study *cost effectiveness* was a term used that defined the point at which the minimum amount of cost (the BHC salary) was used to achieve at least enough additional revenue to cover the BHC salary and “break even”. In other words, cost effectiveness within this study is not synonymous with Cost Effectiveness as associated to a Cost Benefit Analysis.

The focus was to examine service delivery indices (i.e., presenting concerns, time spent, billing codes) and revenue generated on days when an on-site BHC was available versus days the BHC was not present. We hypothesized that: 1) more patients would be seen in the clinic on days when a BHC was present, 2) more reimbursement would be received on days when a BHC was present, and 3) incorporation of the BHC would be cost-effective.

CHAPTER 2

METHOD

Participants

Participants consisted of five pediatric primary care providers who worked within a private practice in rural Virginia and two BHCs. Two providers were medical doctors (M.D.) in pediatrics, one was a doctor of osteopathy (D.O.) in pediatrics, and two were certified nurse practitioners (N.P.). Both BHCs were supervised doctoral students in a doctoral program in clinical psychology with graduate training in pediatric behavioral health and integrated primary care. Each BHC worked at the practice for separate 12-month terms; data collection occurred during the last 2 months of one BHC's term, and the first 4 months of the other BHC's term. It is noteworthy that these providers have been incorporating a doctoral psychology student as a part-time BHC since August of 2009, so the practice of integrated care was fairly well established in this setting. All participants were female.

Procedure

The BHC was on-site during clinic hours 1 full day per week. Practitioners used the BHC in a variety of ways including "curbside consultations" (i.e., meeting about a patient for advice and recommendations); "warm handoff" (on-the-spot referrals of patients with behavioral concerns in the context of a medical visit); and patient referrals to the BHC's schedule for a future appointment. The BHC was located near the nurse's station in the clinic, a centralized and highly visible location that facilitated her being incorporated into regular practice.

The study was approved by the university's Institutional Review Board (IRB). Health care providers were consented at the beginning of the study. Research assistants (RAs) provided all patients attending medical visits a passive study consent and HIPPA forms prior to their visit with the physician. Patients' parents and guardians were required to sign a new HIPPA form for every individual clinic visit.

Data were collected over a 6-month period beginning in June and ending in November in which observations occurred on 10 clinic days on which the BHC was present and 10 clinic days on which the BHC was not present. Two different graduate clinicians served the role of BHC during data collection. One was finishing her 1-year rotation when data collection started and 3 observation days (Fridays) were conducted during her clinic days with 3 comparison dates (Thursdays) during that same time frame. The other BHC was beginning her 1-year rotation as data collection progressed and 7 observation days (Thursdays) were conducted during her clinic days with 7 comparison dates (Fridays) during that same time frame. In this way, BHC Days could be "yoked" to Non-BHC Days, so that only Thursdays and Fridays were ever compared to one another. Thus, data from the BHC who worked on Thursdays could be compared to data collected on Fridays of that same week, and data from the BHC who worked on Fridays could be compared to data collected on Thursdays of that same week. This "yoked control design" permitted data to be consolidated so that analyses were not dependent on one particular BHC's style or day of the week. All five medical providers worked on both Thursdays and Fridays as scheduled by administration (i.e., no single provider always had Thursdays or Fridays off). Over the 10 yoked Non-BHC Days, 277 patient visits were observed; over the 10 yoked BHC Days, 392 patient visits were observed.

A watch and coding sheet (Appendix) were used to collect the relevant information for each patient visit as described below:

From observations, provider report or patient records as needed:

- Provider name and type (MD, DO, NP, BHC)
- Patient demographics (gender, ethnicity, age)
 - These were used to create a unique identifier so that the data collected, bills generated, and insurance reimbursement could later be linked with one another for analyses
- Individuals present for appointment (e.g., parent, siblings, etc.)
- Time spent
 - Total time spent by providers in direct patient care
 - Total time spent by BHC in direct patient care
 - Tracking time spent: a time stamp was recorded every time a provider or BHC entered and exited an exam room to account for direct care versus “non-care” time. These time stamps were later calculated together to derive at overall direct care and non-care time totals.
 - Total time spent between provider and BHC in patient consultation
 - Total time patient spent from check-in to check-out (specifying whether that time was spent in the waiting room versus exam room, and with a provider or alone)

From brief interview with health care provider or BHC after visit was completed:

- List of concerns *presented* during appointment

- List of concerns *addressed* in the appointment
- Any diagnoses given and type of billing code used including level coded for the visit
- Whether patient was scheduled to see BHC in the future (either as an initial appointment if they presented on a Non-BHC Day, or as a follow-up appointment if they presented and saw the BHC)

From administration:

- Copay and insurance company information
- Reimbursement data relative to the observation dates

Visits were coded into one of four main categories: acute, chronic, well, or psychiatric, and were defined as either a “complicated” or an “uncomplicated” visit (Table 1). *Acute visits* applied to 1-time sick visits, which included an ear infection, strep throat, rash, or acid reflux for example. *Chronic visits* applied to the ongoing care of a medical problem such as diabetes or pain management. *Well visits* applied to regularly-scheduled well child checks and *psychiatric visits* applied to visits scheduled specifically to address a mental health-related concern such as ADHD, anxiety, or depression for example. Visits were defined as “uncomplicated” if there was one clear primary concern presented and addressed in the appointment, and if direct patient care was completed within 15 minutes by one provider. If multiple concerns, such as a combination of diabetes, toileting, and compliance, arose; more than one provider was required to provide direct patient care (i.e., doctor and BHC); consultation with BHC, schools, and/or other professionals was needed; or more than 15 minutes were spent addressing concerns, the visit was then defined as “complicated.”

Table 1.

Visit Category Types by Example

EXAMPLES	Uncomplicated	Complicated
Acute	Sore throat; 11 min visit	Sore throat, rash, feeding concerns; 27 min visit
Well	9 month WCC; no additional concerns	9 month WCC; concerns about development and mobility, nursing, and sleep; 45 min visit & referred to BHC
Chronic	Juvenile Diabetes f/u	Juvenile Diabetes f/u, issues with treatment adherence; referred to BHC
Psychiatric	ADHD rx refill; 14 min visit	ADHD assessment; 40 min visit; referred to BHC

Data were obtained for 92% of all visits (8% accounted for participation refusal). RAs were paired together intermittently throughout the data collection phase so that a second trained RA could observe and independently code patient visits to assess inter-rater reliability for this coding scheme. Thirty percent of patient visits were used for this purpose. Data from both RAs were entered and compared to get an overall inter-rater reliability score, with 100% indicating a perfect coding match. Analysis of all inter-rater reliability sessions resulted in a high reliability score of 96%.

CHAPTER 3

RESULTS

Sample Characteristics

Demographics

Across the total 669 visits observed, 396 visits were coded as acute (328 uncomplicated / 68 complicated); 180 were coded as well (132 uncomplicated / 48 complicated); 88 were coded as psychiatric (20 uncomplicated / 68 complicated); and four were coded as chronic (2 uncomplicated / 2 complicated). Because of the low occurrence of chronic visits, these were excluded from further analyses. Table 2 depicts these visit types by BHC vs. Non-BHC days of observations.

Table 2.

Number of Visit Types by Clinic Day

Visit Type	Uncomplicated		Complicated		TOTAL	
	Non-BHC	BHC Day	Non-BHC	BHC Day	Non-BHC	BHC Day
Acute	150	178	26	42	176	220
Well	54	78	30	18	84	96
Psychiatric	6	14	10	58	16	72

Fifty-three percent of appointments (n=355) included a male child as the identified patient. Ninety-two percent of patients were identified as Caucasian (4% multiracial; 3% African American; 1% Hispanic; and less than 1% Asian). Patients ranged in age from 3 days to 17 years, with an average age of approximately 4 years (less than 1 year old, n=133; ages 1-2 years, n=116; ages 3-4 years, n=93; ages 5-7 years, n=120; ages 8-10 years; n=84; ages 11-13 years, n=68; ages 14-17 years, n=55).

Eighteen percent of visits were considered “multi-patient” visits wherein more than one patient (usually siblings) were seen in the same exam room and appointment slot.

Forty-two percent of visits were accompanied by the mother only; 20% of visits were accompanied by “other” (indicating a “nontraditional” caretaker such as aunt or uncle, grandparent, foster parent, etc.) Fifteen percent of visits were accompanied by the mother and siblings of the patient; 10% by both mother and father; 7% by father only; 4% by both parents and siblings of the patient; 1% had no accompaniment; and less than 1% of visits were accompanied by the father and siblings of the patient.

Eighty-four percent of the BHC’s caseload were from visits categorized as psychiatric (n = 53); 11% well visits (n = 7); 5% acute visits (n = 3). Sixty percent were boys (n = 38). Seventeen percent of visits were categorized as multi-patient visits (n = 11). No children under the age of 1 year were referred to the BHC. Patients aged 1 year to 4 years accounted for 30% of BHC contacts (n = 19), and patients aged 5 years to 10 years accounted for the largest group of BHC contacts at 46% (n = 30). Preteen and teenage patients aged 11 to 17 years accounted for 21% of BHC patient contacts (n = 14).

Among the 63 patients who received BHC services, 80% were identified as Caucasian, 16% multiracial, 3% Hispanic, and 1% African American. These data represented a higher portion of minority status children receiving BH services than was expected from the overall sample’s ethnicity distribution. A chi-square test indicated that ethnicity rates among this group was statistically different from the overall sample $X^2(5, N = 667) = 36.92, p < .001$. Of the children identified as “multiracial” within this clinic, 38% (n = 10) received BH services; 33% (n = 2) of Hispanic patients, 8% (n = 50) of

Caucasian patients, and 5% (n = 1) of African American patients met with the BHC during the course of the study.

Patient Concerns Presented

Patients attended the visit with one primary concern in 268 visits (40%). Two primary concerns were presented in 181 visits (27%); three primary concerns were presented in 95 visits (14%), and zero concerns (all well child checks) were presented in 80 visits (12%). Overall, parents presented with 0-7 concerns in all, with 4 or more in less than 7% of visits. Providers reported they discussed all (100%) of the concerns presented in each session, regardless of the number.

Concerns presented were entered into the database as open-ended variables (e.g., “sore throat”, “rash”, and “cough”). These variables were then grouped according to themes for data consolidation. For example, responses of “sore throat”, “strep”, “swollen tonsils”, and “hurts when swallowing” were all consolidated into a “throat” category to facilitate analyses and interpretation of the data. This process yielded 18 main themes related to the description of concerns presented. Respiratory concerns occurred the most frequently; during 21% of visits. Anticipatory guidance during well child checks and concerns related to ADHD accounted for the second and third most frequently occurring topics (14% and 9% respectively). Among the top 18 themes, eight themes were overtly behavioral in nature (e.g., anticipatory guidance during well visits, ADHD, oppositional and noncompliant behavior, toileting, anxiety, feeding, sleep, and school problems) and accounted for 40% of the concerns presented during appointments across all observation days.

Provider Responses to Concerns Raised

All concerns raised were addressed by at least one provider (physician, nurse practitioner, and/or BHC). Medical providers addressed 91% of concerns raised; a BHC addressed 5% of concerns raised, and 4% of concerns were addressed through provider-BHC-collaboration. The 9% of concerns that were addressed by a BHC, either alone or in tandem with the provider, primarily consisted of oppositional and non-compliant behavior, anxiety, and ADHD (these concerns comprised 68% of BHC referrals and warm hand-offs). Concerns related to feeding, sleep, toileting, developmental delays and Autism comprised approximately 5% of the BHC's referrals each, resulting in another 20% of BHC contacts. The remaining referrals were best categorized as "other" due to very low frequency concerns such as school avoidance, depression, medication compliance, and sibling rivalry.

Hypothesis 1: Patient Volume

We hypothesized that more patients would be seen in the clinic on days when the BHC was present. This hypothesis was supported. A total of 392 patients received medical care on a day when a BHC was on site. A total of 277 patients received medical care on a Non-BHC Day. This resulted in 115 more patients seen on BHC Days, which was a 42% increase in patient volume from a Non-BHC Day to a BHC Day within the clinic. Overall, 2-3 more patients were seen per medical provider on BHC Days, resulting in 8-12 additional patients (across all visit types) seen in the clinic on BHC Days.

To explore whether the differences among patient volume could be better explained by chance, a series of inferential statistics were completed. A two-way between-subjects ANOVA was conducted in which the first factor was patient day (BHC

vs. NonBHC) and the second factor was visit type (acute, well, or psychiatric). Clinic day had a significant main effect on patient volume ($F(1, 53) = 30.11, p = .000, \alpha=.05$). The main effect of visit type was also significant ($F(2, 53) = 77.63, p = .000, \alpha=.05$). Additionally, the interaction term of clinic day and visit type was significant ($F(2, 53) = 11.59, p = .000, \alpha=.05$). Interpreting this significant interaction effect, evaluation of the cell means suggested that the volume increase on BHC days for acute visits was greater than that for well visits, and well visits greater than that for psychiatric visits. This finding demonstrates that the significant increase in patient volume was not restricted to psychiatric visits. Tukey post hoc comparisons indicated that differences in patient volume across all visit types (acute, well, and psychiatric) were statistically significant ($p = .000$).

Sixty-three (16%) appointments occurred as BHC contacts. Half ($n=32$) of these contacts were prescheduled appointments as a result of a follow-up from a previous BHC contact or as a referral from provider on a Non-BHC Day. The other half ($n=31$) of these contacts were nonscheduled same-day warm hand-offs initiated by the medical provider. In general, the BHC had contact with six patients per day. The BHC recommended a follow-up BH appointment in 80% of BHC visits ($n=50$).

To assess whether the difference in patient volume was a function of increased patients due to the BHC schedule, an additional analysis was completed without the inclusion of the 32 previously scheduled BHC-specific patients. A statistically significant main effect for clinic day remained as determined by a two-way between-subjects ANOVA even when excluding prescheduled BHC patients ($F(1, 53) = 9.224, p = .004, \alpha=.05$). The main effect for visit type on patient volume increase also remained

statistically significant ($F(2, 53) = 85.028, p = .000, \alpha = .05$). The interaction term, however, no longer retained statistical significance when the 32 prescheduled BHC-specific patients were controlled for. Evaluation of the cell means suggested that the increased volume on BHC days for acute visits was greater than that for well or psychiatric visits, with psychiatric visits occurring much less frequently when controlling for prescheduled BHC-specific appointments. Therefore, exclusion of prescheduled BHC-specific appointments did result in a loss of statistical significance when comparing the volume of psychiatric appointments from BHC Days to Non-BHC Days, as would be expected; however, this exclusion did not weaken main effect results in regards to statistical significance between clinic days or visit types. Tukey post hoc comparisons indicated that differences in patient volume, when excluding prescheduled BHC appointments, remained statistically significant across all three visit types ($p = .000$).

Hypothesis 2: Revenue

We hypothesized that more revenue would be generated on days when a BHC was present. This hypothesis was supported. The following sections outline these data and explain billing, reimbursement, and time savings in more detail.

Analyses revealed that \$2,676 average revenue was generated on Non-BHC Days, compared to \$3,818 average revenue generated on BHC Days (Table 3). The total difference between days was \$1,142 more on BHC Days. Four hundred nine dollars (36%) additional revenue was associated to the increased frequency of psychiatric visits, \$376 (33%) additional revenue was associated to WCCs, and \$357 (31%) was associated to acute visits.

Table 3.

Average Revenue Received by Clinic Day and Visit Type

Visit Type	Non-BHC Day	BHC Day	Additional Revenue Received
U-Acute	\$960	\$1,139	\$179
C-Acute	\$245	\$423	\$178
U-Well	\$988	\$1,427	\$439
C-Well	\$328	\$265	-\$63
U-Psyc	\$76	\$106	\$30
C-Psyc	\$79	\$458	\$379
TOTAL	\$2,676	\$3,818	\$1,142

In order to calculate the average revenue received by clinic day, the following formula was created: $\sum (\text{Average reimbursement amount per visit type} \times \text{number of visit types per clinic day}) / \text{number of observation days} = \text{Average Daily Revenue by Appointment Type}$. This equation was calculated a total of 12 times: once for each visit type (e.g., U-Acute, C-Acute, etc.) per clinic day (i.e., Non-BHC Day versus BHC Day). Day totals were added together for comparison totals. Visit types were collapsed into main categories of acute, well, and psychiatric visit types for overall comparisons.

To explore whether differences in revenue generated could be better explained by chance, a two-way between-subjects ANOVA was conducted in which the first factor was clinic day (BHC vs. Non-BHC) and the second factor was visit type (acute, well, psychiatric). Clinic day had a significant main effect on revenue generated ($F(1, 53) = 38.955, p = .000, \alpha = .05$). The main effect of visit type was also significant ($F(2, 53) = 94.392, p = .000, \alpha = .05$). Additionally, the interaction term of clinic day and visit type was significant ($F(2, 53) = 10.214, p = .000, \alpha = .05$). Interpreting this significant

interaction effect, evaluation of the cell means suggested that the revenue generated on BHC days for both acute and well visits was greater than that for psychiatric visits. Tukey post hoc comparisons indicated that there was a statistically significant difference between revenue generated among psychiatric visits and both well and acute visits ($p = .000$); acute and well visits were not statistically significantly different in terms of revenue from each other, however ($p = .598$).

An additional two-way between-subjects ANOVA was completed to determine the difference in additional revenue when controlling for the 32 prescheduled BHC appointments. The main effect for clinic day remained statistically significant ($F(1,54) = 10.942, p = .000, \alpha=.05$). The main effect for visit type also remained statistically significant ($F(2, 54) = 52.764, p = .000, \alpha=.05$). When controlling for the prescheduled BHC-specific appointments, the interaction term no longer remained statistically significant. Evaluation of cell means remained similar in that the revenue generated on BHC Days during acute and well visits was greater than that for psychiatric visits. Therefore, exclusion of prescheduled BHC-specific appointments did result in a loss of statistical significance when comparing the revenue generated by psychiatric appointments from BHC Days to Non-BHD Days, as would be expected when less of these appointments are accounted for; however, this exclusion did not weaken main effect results in regards to statistical significance between clinic days or visit types. Tukey post hoc comparisons remained similar as well, with revenue among psychiatric visits testing as statistically significantly different from both acute and well visits ($p = .000$); acute and well visits remained nonsignificant from each other ($p = .351$).

Ancillary Data Pertinent to Hypothesis 2

Insurance Demographics

The majority of patient data collected in this study corresponded to Virginia state Medicaid third party payers (N=394, 59%). Commercial insurance plans comprised 40% (N=269) of the data. Six individuals (1%) were identified as self-pay patients. Data regarding copays revealed that 75% of visits observed were associated with no copayment requirements. The remaining 25% of visits were associated with copayment charges with a range of \$2 to \$35, however, less than half of patients seen followed through with paying the required copay amount. These data points were presented to the clinic administration and were confirmed to be representative of the overall clinic population and not specific to the patients attending clinic on Thursdays and Fridays during the data collection phase.

Reimbursement Rates

Calculations were conducted to determine a reimbursement rate by comparing the average amount billed to the average amount received (i.e., paid towards the bill). Amount “billed” included all charges associated with the visit: copay requirement and charges associated to E and M (Evaluation and Management) coding as well as CPT coding. Amount “received” included any payment made towards billed charges, whether out-of-pocket by the patient or from third party insurance payers.

Up-coding of E and M codes was conducted in 19% (N=127) of all observed visits. Forty-nine percent of up-coded visits (N=62) were up-coded due to medical complexity and increased time spent. Forty-eight percent of up-coded visits (N=61) were

up-coded due to behavioral complexity and increased time spent, with 3% (N=4) of up-coded visits due to both a medical and behavioral increase in time and complexity. The BHC was used for about half of the up-coded behavioral visits (N=32).

Self-pay patients paid an average of 35% of billed charges. Medicaid had a reimbursement rate of 37% and the commercial insurance group paid an average of 48% of billed charges. There were no differences in reimbursement by clinic day or by bills generated for patients who had BHC-contact, resulting in an overall sample reimbursement rate at a weighted average of 42%.

Reimbursement rates varied by visit type (see Table 4). The lowest reimbursement rates were associated with WCCs (33% for complicated wells, and 38% for uncomplicated wells). The highest reimbursement rates were associated with uncomplicated acute visits and complicated psychiatric visits, both at a 50% reimbursement rate.

Table 4.

Reimbursement Rate by Visit Type

Visit Type (N)	Average Billed	Average Received	Percentage
U-Acute (227)	\$128	\$64	50%
C-Acute (54)	\$213	\$94	44%
U-Well (85)	\$483	\$183	38%
C-Well (33)	\$470	\$156	33%
U-Psyc (17)	\$173	\$76	44%
C-Psyc (53)	\$159	\$79	50%

Time

Patient Perspective. On Non-BHC days, patients spent an average of 61.39 minutes on site, with 16.85 minutes of direct care from their provider and 44.54 minutes of noncare time that was spent waiting in the waiting room and exam room. On BHC days all patients regardless of visit type experienced a decrease in noncare time. Specifically, on BHC Days, each patient spent an average of 5.38 fewer minutes in noncare time in the waiting and/or exam room compared to non-BHC days, a statistically significant difference ($t(643) = 2.101, p = 0.036, \alpha = .05$). It is important to note that these wait time differences occurred for the entire sample as a function of whether it was a BHC day, regardless of whether patients were scheduled to see the BHC.

A comparison of wait times for patients seen by the BHC indicated patients spent statistically significantly less time in the waiting room ($M = 3.21$ minutes, $t(654) = 1.825, p = 0.030, \alpha = .05$) and statistically significantly less time waiting in the exam room ($M = 5.13$ minutes, $t(656) = -7.323, p = 0.000, \alpha = .05$). BHC-patients received an average of 38.23 minutes of direct care (almost 22 minutes more than patients on Non-BHC Days), which was statistically significant ($t(667) = 2.629, p = 0.009, \alpha = .05$), and, although they were all seen by two providers (the medical provider and BHC), were only on site an average of 10 minutes longer than other patients (see Table 5).

Table 5.

Average Time Spent in Minutes

	NonBHC Day	BHC Day	BHC Contact
Pt Waiting Room	16.72	14.80	13.51
Pt Exam Room	44.87	43.04	61.12
Pt Onsite	61.39	57.56	71.70
Direct Care Total	16.85	39.04	38.23
NonCare	44.54	39.16	34.64

Provider Perspective. The difference in time spent by providers on Non-BHC Days (M=16.85, s=10.46) and BHC Days (M=14.26, s=7.93) represents a time savings of over 2 minutes per patient regardless of the number and type of concerns presented, a statistically significant difference ($t(489) = 3.471, p = .001, \alpha=.05$). Further, providers spent an average of 12.15 minutes in the primary care visit with patients who were referred to see the BHC, resulting in an average of 4.70 minutes saved per patient when compared to provider time spent on Non-BHC Days ($t(661) = 2.976, p = 0.003, \alpha=.05$), and an average of 2.11 additional minutes saved per patient when compared to time spent with all patients on BHC Days ($t(661) = 3.635, p = 0.000, \alpha=.05$); both differences were statistically significant.

Provider time savings varied by visit type (see Table 6). The greatest time savings occurred within complicated psychiatric visits, resulting in PCPs saving an average of 19.71 minutes per visit. Complicated psychiatric visits had the only statistically significant time savings difference found ($t(65) = 5.683, p = 0.000, \alpha=.05$). The BHC spent a range of 7 to 57 minutes with each patient, resulting in an average visit time of 27 minutes.

Table 6.

PCP Time Spent by Visit Type (average in minutes)

Visit Type (N)	Non-BHC Day	BHC Day	Time Saved
U-Acute (227)	12.14	12.07	0.07
C-Acute (54)	19.04	16.61	2.43
U-Well (85)	19.54	17.00	2.54
C-Well (33)	28.58	28.28	0.30
U-Psyc (17)	19.33	12.79	6.54
C-Psyc (53)	31.40	11.69	19.71

Reimbursement Perspective. The average reimbursement per visit type (see Table 4) was divided by the average amount of time spent by provider per clinic day per visit type (see Table 6) to calculate a reimbursement per minute rate. For example, \$79 was the average reimbursement amount for complicated psychiatric visits. On Non-BHC Days, PCPs received \$79 for an average 32-minute psychiatric appointment, versus \$79 for an average 12-minute appointment on the BHC-Day, resulting in a rate of \$2.61/minute for psychiatric visits on Non-BHC Days compared to a rate of \$7.04/minute for psychiatric visits on BHC-Days, resulting in close to \$5.00 savings per minute. See Table 7 for all reimbursement per minute ratios.

Table 7.

PCP Reimbursement Per Minute by Visit Type and Clinic Day

Visit Type	Reimbursement	Non-BHC Day	BHC Day	Cost-Benefit
U-Acute	\$64	\$5.67/min	\$5.68/min	N/A
C-Acute	\$94	\$4.89/min	\$5.60/min	+\$0.71/min
U-Well	\$183	\$10.05/min	\$11.53/min	+\$1.48/min
C-Well	\$156	\$5.15/min	\$5.25/min	+\$0.10/min
U-Psyc	\$76	\$3.79/min	\$5.54/min	+\$1.75/min
C-Psyc	\$79	\$2.61/min	\$7.04/min	+\$4.43/min

Hypothesis 3: Cost Effectiveness

We hypothesized that incorporation of the BHC would be cost effective. This hypothesis was supported. In order to offset the current stipend salary that the clinic pays for BHC services, \$192 per BHC Day needed to be generated to break even and demonstrate a cost-effective delivery of services. Results based on all visit types and clinic days are represented in Table 3 and indicate a total \$1,142 average cost-benefit on BHC Days. This finding revealed that using an on-site BHC one day a week not only covered the cost of the service but generated an additional \$950 daily. In sum, the clinic pays \$10,000 per year for the 1-day BHC service, and in turn, the service yields an annual cost-benefit of \$59,384 which results in an annual cost-offset of \$49,384 after behavioral health expenses are deducted.

CHAPTER 4

DISCUSSION

This study evaluated the cost effectiveness of a 1-day-per-week integrated care service in a rural, stand-alone pediatric practice. Currently the literature is sparse in terms of the economics associated to integrated behavioral and pediatric health care. Therefore, this study demonstrated a way to examine important variables associated to one model of integration's cost (BHC salary) and benefits (time saved and additional revenue generated) related to BH services.

This clinic was implementing a modified version of the Collaborative Team Model of integrated care (Roberts, 1986; Strosahl, 1998) in which the goal was to have the medical provider and BHC collaborate to share responsibility and joint decision making as a team on behalf of the mutual patient, and in which the BHC strived to keep pace with medical providers' service delivery and provide brief (20-30 minute), evidence-based interventions to the population of clinic patients as they presented for medical appointments. Because the BHC was only available for 1 day a week, the model of integration was limited in how much of the population BH services could realistically reach and about half of BH appointments were scheduled in advance, so their method was not "the gold standard" but they were actively striving towards that goal during the days a BHC was available on site.

As noted earlier, data were collected during the fourth year of integrating a psychology graduate student as a BHC into this particular pediatric practice. As such, participants were invested in their model of integration and had insight related to how incorporating a BHC could impact their practice. Therefore, this was not a naïve study.

Nonetheless, no formal data collection or analyses had been conducted prior to this study to more objectively identify specific outcomes associated with their model of integration, thus this study was a first step in that direction. Although it was possible that using the BHC may slow the clinic down and may not generate additional revenue because no direct billing was associated to the BHC, informal observations throughout the previous years of integrating BH services suggested the potential for positive outcomes. As such, the hypotheses for this study were that: 1) more patients would be seen in the clinic on days when a BHC was present, 2) more revenue would be generated on days when a BHC was present, and 3) the incorporation of the BHC would be cost-effective. All three hypotheses were supported.

Hypothesis 1: Patient Volume

Because the BHC was available only 1 day a week, complex psychiatric cases were prescheduled for BHC Days (50%) and other BH referrals were squeezed in as was feasible during same day appointments (50%). This model seems to be an efficient way to use limited access to BHC wherein the neediest patients can be pre-scheduled for the BHC and assist the PCPs in maximizing their productivity with more medically-focused appointments.

Data showed that 42% more patients were seen on BHC Days consistently, which can be attributed to BHC-use and its impact on time savings that enhanced patient flow and provider productivity. Results indicated that the increase in patient volume was not an artifact of additional patients being prescheduled for the BHC. Rather, even when controlling for those patients, days when a BHC was available continued to produce a higher volume of patients across acute, well, and psychiatric visit types due to time

savings associated to warm-handoffs. Data also demonstrated less wait time per patient and providers' use of the BHC for on-the-spot treatment (50% of BHC patients were warm hand-offs), lending additional support to the possibility that patient flow was enhanced on BHC days. In addition, BHC-use facilitated strategic scheduling so that more of all appointment types could be scheduled. Higher patient volume occurred because BHC Days allowed the clinic to accept walk-in appointments and double-book psychiatric appointments when needed with acute appointments because the medical provider would have less time demand during psychiatric appointments with a BHC onsite. This method allowed 8-12 additional patients to be seen on BHC days; on average, 6 of those additional patients were seen by the BHC.

Hypothesis 2 & 3: Reimbursement & Cost Effectiveness

The current study offers evidence that use of an onsite BHC can alleviate time demand for providers. In turn, the time saved can be used to see additional patients, which facilitates additional revenue for the clinic. Results from this study showed that providers spent 19.33 minutes on average in *uncomplicated psychiatric visits* on Non-BHC Days, compared to 12.79 minutes of their time spent with such patients on BHC Days—showing a time demand of 6.54 average minutes for those appointments when providers have to address psychiatric concerns without a BHC onsite. Further, when multiple concerns were raised and the visit became a *complicated psychiatric visit*, providers spent 31.40 minutes on Non-BHC Days, compared to 11.69 minutes on BHC Days—revealing a time demand of 19.71 minutes when providers have to address those concerns without access to a BHC onsite. These time savings permit additional billable medical encounters to accumulate and results indicated a total \$1,142 average cost-

benefit on BHC Days, which pro-rates to an annual cost-offset of \$49,384 after behavioral health expenses are deducted (specific to the observed practice).

Multiple fiscal challenges have been presented (e.g., Cummings & O'Donohue, 2008; Kessler, 2008) that pose barriers to billing and reimbursement mechanisms for BHCs and PCPs. The key ingredient to benefits uncovered in this study, however, is not what the BHC did but what the providers were already doing: discussing 100% of concerns brought up in all appointments. This left a substantial margin of time available to be saved; and it was the time saved that allowed for more patients to be seen and more revenue to be generated. Had the current providers not already been devoting their time to discussing patient concerns, there would not have been any time to save for them by incorporating BH services. Time saved increased provider productivity, volume of patients, and billable encounters, which resulted in additional revenue flow even with the absence of the BHC's ability to bill separate charges, and even when controlling for prescheduled BHC patients.

It was expected that copayments associated with the increased volume of appointments on BHC Days would also contribute a significant additional amount of revenue, but the high proportion of Medicaid patients (59%) coupled with substantial noncompliance of copayments related to commercial insurance, prevented that expectation from bearing out in the data. This is an area ripe for financial growth within this specific clinic; if policies are set in place to encourage compliance with copayment, then as patient volume increases on BHC Days, so will funds associated to copayments among the 40% of patients with commercial insurance.

Additional Considerations

Expansion of BH Services

Observations within this clinic revealed 40% of the main concerns raised were behaviorally oriented (e.g., well child anticipatory guidance, ADHD, oppositional and noncompliant behavior, toileting, anxiety, feeding, sleep, and school problems). This finding is congruent with pediatrician reports that up to 60% of their time is spent addressing concerns related to behavior problems, focusing on anticipatory guidance and assessing developmental progress (e.g., Brazelton, 1975).

When the number of BH concerns raised across all observation days is compared to the number of concerns addressed by the BHC specifically, results indicate that the current method of integration allowed the BHC to intervene among 9% of BH concerns presented. Meeting that 9% of BH need is keeping the BHC quite busy during their 1 day a week onsite (averaging six patients per day), so this data point does not suggest under use of the BHC on BHC Days. Rather, the supply of BH services is not meeting the demand of BH needs, so expanding BHC coverage to more days a week is needed. The high demand of BH needs coupled with the time and cost savings demonstrated from the current 1 day a week model suggests that this clinic could expand services across several more clinic days (perhaps if not full time) and not fall short of maintaining cost effectiveness. Maintaining program evaluation to monitor this expansion and its financial impact is highly recommended.

Further, incorporating BHC services more strategically in WCC appointments could significantly enhance time and cost benefits. Time saving potential for the providers is ripe, given that providers spent almost 30 minutes during complicated well

visits regardless of clinic day or BHC access because the BHC was not used during these appointments because of the limited availability of BH services. Because of this time drain, a 33%-38% reimbursement rate is associated to WCC appointments; this could improve as time savings occur.

Ethnic Minority Patients

An unexpected finding was the significant difference in ethnicity rates among patients who received BH services. It is unclear from this data why the relationship between BHC contacts and ethnicity exists. Because of the BHC's limited availability throughout the typical week, it is unclear whether minority patients within this clinic present with a higher prevalence of BH concerns, are more compliant with BH referrals, or whether such patients are being selectively prioritized for BH services. Reassessing these data when more BH coverage is expanded at this clinic will be an important area of focus. What we can note, however, is that multiple studies have cited the unmet need of BH services accessible to ethnic minority children and adolescents (e.g., Kataoka, Zhang, & Wells, 2002), and our unexpected finding of a significant relationship between BHC contacts and ethnic minority patients may lend evidence to support an integrated behavioral health model within a pediatric setting as a way to better reach these underserved children.

Salary Comparisons

Demonstrating cost effectiveness based on a part-time student's salary of \$10,000 is admittedly a far cry from demonstrating cost effectiveness based on a full-time licensed clinical psychologist's salary. According to a salary survey conducted by the APA in 2009, licensed clinical psychologists working within group primary care

practices 15-19 years earned an average of \$97,200 (n = 5) and 20-24 years at an average of \$103,243 (n = 6) annually (Finno, Michalski, Hart, Wicherski, & Kohout, 2010). The salaries of clinicians vary greatly and differ based on degree (masters or doctoral), program focus (e.g., clinical, counseling, school), setting (e.g., primary care, private practice, community mental health), and years of experience (Finno et al., 2010). Many of these differences impact whether the BHC can bill for services and necessitate what kind of codes can be used (i.e., Health and Behavioral Codes versus traditional psychiatric codes). Further, salaries also vary by region and state. This variability makes it difficult to posit how exactly the cost offset demonstrated in this study might apply to other types of clinicians in a BHC role. Based on the findings of this study, it is recommended that any level of professional in a BHC role could maximize their potential for cost effectiveness within an organization by practicing in a way that facilitates the medical providers' productivity. Again, real-world research is needed to continue documenting how these various factors change financial outcomes associated to PCBH.

Program Evaluation is Essential

In order to collaborate the most efficiently, the model of integration and mechanisms for billing may need to be site-specific and change over time as provider habits change. Ongoing program evaluation will allow clinic personnel to know when they have “hit the sweet spot” for integrative services and are maximizing cost effectiveness within their clinic culture. For example, if a medical provider's practice habit is to spend 15 minutes or less with each patient, a BHC is not going to save that particular provider time by seeing the patient for an additional 25 minutes. In fact, the BHC will in turn be costing the provider time by occupying the exam room and

preventing other patients from getting timely medical care. If use of the BHC slows the provider down, this can be a quick way to decrease provider satisfaction with BH services and lower future BH referrals. Instead, in this case, a suggestion that could be more time and cost efficient is to see the patient in another location, perhaps an overflow exam room or BH office, so that the medical provider pace and clinic flow are not negatively impacted. This suggestion could be especially important for clinics that are offering BH services at no charge to their patients, as BHCs in this role can only generate additional revenue by assisting medical providers in enough time savings to see an increase of medical visits.

When medical providers practice in a way that promotes long visits and addressing multiple concerns, as is the case with the clinic observed, it makes sense for the BHC to refrain from billing separately and use time savings to increase patient volume and reimbursement for the medical providers. When providers see patients quickly and there is little time available to save, it might make more sense for the BHC to see patients separately and bill for the BH service to bring in another flow of revenue for the clinic. Without conducting ongoing program evaluation of integration style and efficiency, clinics may unknowingly be using inefficient integration models and missing out on time and money savings that could be uncovered. The following section provides some specific areas to improve upon this study and offer suggested future directions for program evaluation.

Strengths and Limitations

Unfortunately when conducting “field experiments” as is the case with this real-world research design, and when targeting a specific case study for observation,

limitations can dampen the generalizability and impact of the findings. This study was specific to a rural private pediatric practice in Virginia that had been using a psychology graduate student for a 1-day-a-week model of integrated behavioral health care across the past 4 years. As such, the results may have little generalizability to large urban health care organizations, or other medical specialties, as well as limited generalizability to clinics in the initial stages of integration or ones who have BH services offered throughout the work week, in addition to clinics that have BHCs with varying levels of credentials and experience. These specific study limitations provide a variety of future avenues for additional research.

Additionally, this study's focus was solely on economic outcomes. A more complex and comprehensive study could also assess for a myriad of other very important factors to include medical and behavioral health outcomes among patients, quality of life, and satisfaction rates among patients, providers, and staff. Future studies that can encompass more of a cost-utility function than cost-offset alone are needed.

Because data were collected during the fourth year of this clinic's commitment to incorporating BH services, the results are a reflection of refining a specific style of integration. We do not know from this study how cost benefits may have developed and changed throughout the years of enhancing their use of BHCs. Further, we do not know how time or revenue outcomes may differ based on BHC or provider characteristics such as personality, biases, or practice habits.

Program evaluation that could track the long-term trajectory of implementing a new integrated model throughout later years of sophistication would be an ideal addition to the literature base. Furthermore, this could inform BHCs and potential employers

about their long-term financial risks and gains as they may need to be prepared for growing pains of building a new collaborative relationship with the expectation that cost-benefits may not occur until years down the road.

Visit types categorized as psychiatric were the primary appointments associated with BHC use in this study. A better understanding of how BHCs can be used for preventative care in WCCs could be an advantageous addition to the literature and could offer an additional margin of time savings potential for medical providers. As expansion of BH services is implemented within the study clinic site, this could be an area of future focus.

Because this was a field experiment study design, real-world schedule conflicts prevented some desired control over BHC-related interventions. Ideally, the two BHCs observed would have both been available an equal number of Thursday and Friday clinic days. This was not possible given the students' 12-month clinical rotation schedules. Therefore one BHC was observed across her last 2 months of providing services on Fridays, and one BHC was observed across her first 4 months of providing services on Thursdays.

However, this scheduling scenario did allow for Thursday and Friday clinic days in which a BHC was not available to be used as a comparison group in a yoked control design. In other words, Thursdays and Fridays were not compared to each other: Non-BHC Days (whether Thursday or Friday) were compared to BHC Days (whether Thursday or Friday). This design is a substantial strength of this study and resulted in a strong control group.

In addition to the yoked control design, another significant strength related to methodology includes that data were collected throughout June to November. This collection phase permitted data to be collected across the summer and fall months, an advantage that diversified our sample in two important ways. One, pediatric visits were observed during non-school and school months. Two, pediatric visits were observed across varying disease seasons. Although 6 months is still a snapshot of time, observing across summer and fall months does enhance result generalizability as medical appointments and behavioral concerns may vary based on disease or school seasons.

Lastly, it is important to note that statistically significant results uncovered from this study remained significant even when controlling for prescheduled BHC appointments. This held true in regards to patient volume, visit type, time saved, and money generated. These findings are a shining light into what has been a darkness of unknown effects related to using a BHC—particularly when separate psychiatric billing is not available.

Conclusion

Although the findings are specific to this case study and have limited generalizability, the results are important to consider within the context of previous literature. Physician lack of time and training (e.g., Perrin & Stancin, 2002) and poor follow-through with referrals to outside mental health agencies (e.g., Kazdin, 1996) have been documented as critical barriers of treating BH problems within pediatrics, and many children with significant problems do not receive the services they need (US Public Health Service, 2000). These points may be used as a plea for adopting integrated care models within pediatric clinics, but barriers associated to the implementation of

integration such as lack of organization, time to develop programming, and/or funding mechanisms to make programs sustainable (e.g., Drotar, 1995) remain serious challenges. This makes it imperative for individuals within programs that are currently integrated to attempt conducting real-world economic evaluations, such as this study, so that we can better understand the many pieces of the economic puzzle that is integrated behavioral health care, regardless of integration nuances (i.e., 1-day-a-week practice versus full time; specialty versus primary care; student versus licensed professional as BHC).

This study revealed statistically significant results that do support the potential for sustainable primary care behavioral health and highlight how a staff model versus a fee-for-service model might impact the clinic economy in a beneficial way. Given that chronic pediatric conditions account for most of pediatric medical costs (\$12 billion per year) (Ringel & Sturm, 2001), and of these, conditions like ADHD, depression, and developmental disabilities consume pediatricians' time the most, the margin of time and money to be saved by implementing an efficient BH-integration seems substantial.

Further, because BHCs can offer preventative services and treatments without billable psychiatric diagnoses, evidence supporting the ability to gain cost-benefits without engaging in billing can be especially relevant and useful. Much of what psychologists have to offer behavioral health primary care includes collaboration, feedback, consultation, and program development—all of which remain unbillable services despite their value and necessity within integrated models (Kessler, 2008). A staff model within ACOs would encourage and support these very important contributions. Further, results support the possibility that efficient use of a BHC could potentially facilitate increased compliance with more rapid access to care, open access

scheduling, evidence-based practices, and integration of specialty services as recommended for high performance health care systems (e.g., Gauthier, Davis, & Schoenbaum, 2006; Shih et al., 2008).

Ultimately the worlds including clinical, operational, and financial health care need to align (Patterson et al., 2002) so that the challenges and barriers to providing integrated BH services can be addressed more effectively. Studies that can continue to explore the indirect cost outcomes that do not rely on psychiatric billing codes for sole sustainability can prove especially informative as our nation's health care continues to shift towards a more equal and more comprehensive system.

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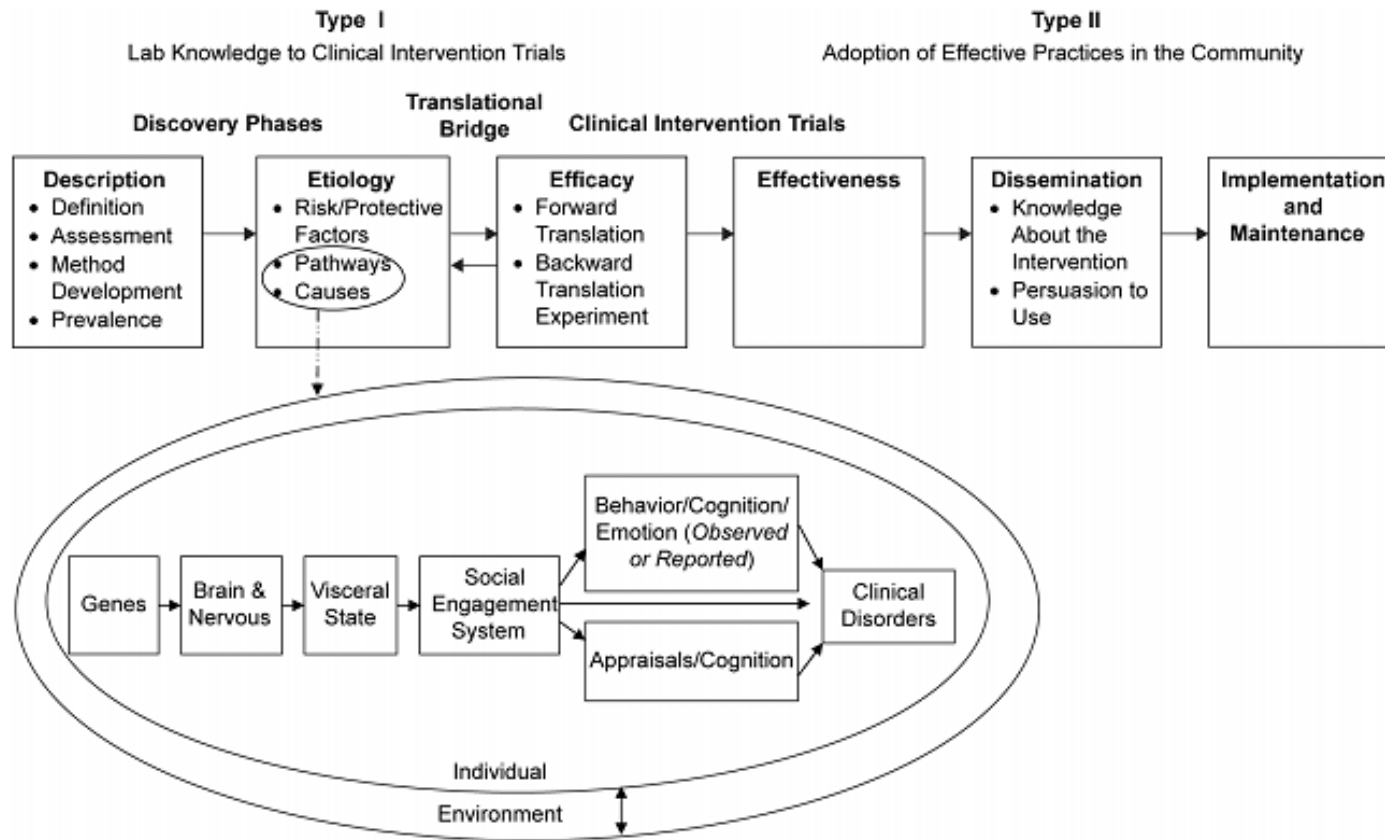
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APPENDICES

APPENDIX A

The Translational Research Cycle



Modified from Heyman & Slep, 2009

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 2002 - 2003 VIC *Campus Pride Scholarship*