



Cornerstones

Practice-Based Research Syntheses of Child Find, Referral, Early Identification, and Eligibility Practices and Models
Volume Two, Number Five

December 2006

Practices for Increasing Referrals from Primary Care Physicians

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This practice-based research synthesis included a secondary analysis of two research reviews of studies investigating interventions to improve primary care physician referrals to secondary specialist care. This synthesis included 42 studies of primary care physicians. The interventions constituting the focus of analysis included information campaigns, referral or practice guidelines, feedback on referrals, outreach to physicians, and organizational interventions. Results showed that interventions that more actively involved primary care physicians in the referral process were more effective in influencing rates and patterns of referrals. Implications for improving child find and outreach to primary referral sources are described.

Purpose

The purpose of this practice-based research synthesis was to identify which interventions were most effective in terms of improving primary care referrals to secondary care specialists. This was accomplished by conducting a secondary analysis of two research reviews of intervention studies to affect changes in referrals from primary care physicians to secondary care specialists (Faulkner et al., 2003; Grimshaw et al., 2005). Both research syntheses included studies that were specifically designed to influence referral rates and patterns by primary care physicians and other health-care providers.

The secondary analysis was guided by a framework that focuses on the characteristics of practices that are associated with different outcomes (Dunst, Trivette, & Cutspec, 2002). The analyses reported in this *Cornerstones* differed from those in the original reviews by attempting to isolate those practice characteristics that mattered most in terms of influencing referral patterns and rates of referrals. More specifically, the practices that had direct implications for improving primary referral source referrals to early intervention and preschool special education were examined to identify those practices that held special promise for improving child find.

Background

The major aims of the primary reviews were to “identify [and] estimate the effectiveness of interventions to change primary care outpatient referral rates or improve outpatient referral appropriateness” (Grimshaw et al., 2005, p. 3) and to “review the available evidence on initiatives affecting primary care referral to specialist secondary care” (Faulkner et al., 2003, p. 878). To be included in either review, studies had to explicitly include intentional efforts aimed at influencing or changing referrals by primary health-care professionals.

Description of the Practices

The practices constituting the focus of analysis included information campaigns, referral or practice guide-

This *Cornerstones* is a publication of the Tracking, Referral, and Assessment Center for Excellence (TRACE) funded by the U. S. Department of Education, Office of Special Education Programs (H324G020002). The opinions expressed are those of the authors and do not necessarily reflect the views of the U.S. Department of Education. TRACE is an initiative of the Center for Improving Community Linkages, Orelena Hawks Puckett Institute (www.puckett.org). Copyright © 2006 by the Orelena Hawks Puckett Institute. All rights reserved.

lines, feedback to physicians, outreach to physicians, or organizational interventions designed to better link primary and secondary care. Information campaigns included distribution of educational materials (e.g., brochures) or videos to promote referrals to secondary care specialists. Referral or practice guidelines included descriptions of procedures primary care physicians used to make referrals or procedures for implementing targeted medical interventions. Feedback to physicians included feedback on referral rates and the use of referral feedback forms. Outreach to physicians included specialist or consultant visits to primary care physicians. Organizational interventions included the provision of specialty care in the primary care settings or the attachment of a specialist to a general practice. Several of the studies included two or more of the five practices. Faulkner et al. (2003) and Grimshaw et al. (2005) also examined the influences of monetary incentives on referral rates and patterns but they were considered not relevant for this secondary analysis and therefore were not included in this synthesis.

The interventions constituting the focus of investigation varied along a continuum from *passive* to *active* efforts to affect changes in referral rates and patterns. Passive distribution of educational information were considered the weakest intervention (Freemantle et al., 2003) and active involvement by the study investigators to affect changes in referral rates and patterns were considered the strongest interventions (Clow, Dunst, Trivette, & Hamby, 2005). The extent to which the different kinds of interventions had like or unlike effects on referral patterns and rates was the primary focus of analysis in this research synthesis.

Search Strategy

Search Terms

Grimshaw et al. (2005) used *refer** and *consultation** with *outpatient** as their search terms. Faulkner (2003) used *referral* in combination with *general practice* and *primary care* which themselves were combined with *intervention*, *innovation*, *program**, *scheme**, and *project** as search terms. The terms were searched in the titles, abstracts, and index headings of the studies to identify relevant investigations.

Sources

Both groups of investigators searched the Cochrane Effective Practice and Organization of Care (EPOC) registry for relevant studies. MEDLINE, EMBASE, Healthstar, and the Cochrane Library were searched by Grimshaw et al. (2005). The United Kingdom National Research Register was searched by both Faulkner et al. (2003) and Grimshaw et al. (2005), and the United Kingdom National Health Service Centre for Reviews and

Dissemination was searched by Faulkner et al. (2003). Reference lists of retrieved papers were hand searched to identify other studies by both groups of investigators.

Selection Criteria

Grimshaw et al. (2005) included studies that were “Randomised controlled trials, controlled clinical trials, controlled before and after studies, and interrupted time series of interventions to change or improve outpatient referrals. [Where the] participants were primary care physicians [and] outcomes were objectively measured provider performance or health outcomes” (p. 1). Faulkner et al. (2003) included studies that were “an intervention of any sort in the general practice setting and/or system...having a measured effect upon referral[s] to specialist care (in the secondary care setting)” (p. 879). Studies were excluded if they did not involve intentionally planned efforts to influence referred rates or patterns. The studies constituting the focus of this secondary review and synthesis included investigations that used referral rates or patterns as an outcome measure and the interventions constituting the focus of investigation specifically were designed to change or influence referrals.

Search Results

Grimshaw et al.’s. (2005) review included 12 studies and Faulkner et al.’s. (2003) review included 35 studies that evaluated the five types of interventions constituting the focus of this synthesis. The published research reviews as well as supplemental information included in the Grimshaw et al. (2005) paper, and data extraction tables for the Faulkner et al. (2003) review found in the *British Journal of General Practice* Web site (www.rcgp.org.uk/PDF/Journal_Faulkner-s3.pdf), were used to code the study characteristics for this research synthesis.

Table 1 shows which studies were included in each review and the number of participants (patients and physicians) and practices included in the intervention and control groups. Only five studies were included in both reviews (Bennett, Haggard, Churchhill, & Wood, 2001; Kinnersley, Rapport, Owen, & Stott, 1999; Linnala, Aromaa, & Mattila, 2001; Morrison et al., 2001; O’Cathain, Froggett, & Taylor, 1995). This was not surprising given the fact that each group of investigators used different search terms and strategies which would be expected to identify different studies (Lucas & Cutspec, 2005). The studies included in either review, however, all focused on interventions affecting rates and patterns of referrals to specialist secondary care.

Participants

Information about the study participants in the Grimshaw et al. (2005) review were included in an appendix of the research synthesis. Study participant information

in the Faulkner et al. (2003) review was obtained from the data extraction table for the published paper at the Web site cited above.

The number of patients constituting the focus of referrals was reported in 25 studies. The numbers ranged between 24 and 8,245 in the intervention groups and between 19 and 2,294 in the comparison and control groups. The number of physicians who were the focus of investigation was reported in 11 studies. The numbers ranged between 10 and 300 in the intervention groups and between 4 and 300 in the comparison and control groups. The practices included in the studies were reported in 18 studies. The numbers ranged between 1 and 113 in the intervention groups and between 1 and 101 in the comparison and control groups.

Interventions

Information about the interventions that were the focus of analysis were found in both the research reviews (Faulkner et al., 2003; Grimshaw et al., 2005) and in the supplemental source material for both reports. The interventions were coded according to type, frequency (number of contacts), and length (months). Table 2 shows the coding of the studies. Information campaigns were used in 9 studies (21%), referral or practice guidelines were used in 12 studies (29%), feedback to physicians was used in 4 studies (10%), outreach to physicians was used in 10 studies (24%), and organizational interventions were used in 22 studies (52%). Multiple interventions were used in 11 studies (26%).

The interventions in any one study lasted from as few as two months to as many as 48 months. The average length of the interventions was 12.78 months (SD = 11.11). The number of contacts intervenors had with the physicians was coded as occurring one time (7 studies), a couple of times (7 studies), or many times (28 studies) during the conduct of the studies. Information campaigns typically were “one shot” interventions whereas outreach to physicians and organizational interventions generally involved repeated contacts.

Outcomes

The outcome that was the focus of analysis in this synthesis was the increase or decrease in referrals from primary care specialists to secondary care specialists depending on the purpose of the study. This was reported by both groups of investigators as a percent difference from a pretest to posttest or between experimental and control/comparison groups. These percent differences were used as the size of effect of the interventions intended to affect changes in rates or patterns of referrals.

The referral outcomes that were used to estimate the size of effects of the interventions included the number of referrals made by the physicians or practices, the rates

of referrals (e.g., number per 100 patients), the appropriateness of referrals, and the odds ratio of referrals in the intervention compared to the control group or condition. Effect sizes were reported in 24 studies (57%) and were estimated in the remaining studies (43%) from information included in the Faulkner et al. (2003) and Grimshaw et al. (2005) reports.

Synthesis Findings

Table 3 shows selected characteristics of the studies and the percent differences in the referral measures. Twenty two (22) studies were randomized controlled trials (52%), 9 studies were observational or clinical controlled trials (21%), and 11 studies were interrupted time series or controlled before and after studies (26%). The largest majority (81%) of studies evaluated the effectiveness of the interventions comparing an experimental group against a control or comparison group. The number of referrals was used as the outcome in 19 studies (45%), rates of referrals were used as the outcome in 13 studies (31%), the appropriateness of the referrals was used as the outcome in 5 studies (12%), and an odds ratio was used as the outcome in 5 studies (12%).

Table 4 summarizes the findings according to four study characteristics and three intervention characteristics. Substantive interpretation of the findings was based on the mean effect sizes and their 95% confidence intervals, and was supplemented by inspection of the individual studies contributing effect sizes to the aggregate results. The results, taken together, indicate that interventions that focused on small numbers of physicians and practices implemented over an extended period of time that involved outreach to physicians or organizational interventions were effective in terms of influencing the number of referrals and rates of referrals of patients to secondary care providers. The particular studies that had most of these characteristics were ones that combined outreach to physicians or organizational interventions with other practices (Abu-Ramadan, 2002; Banait, Sibbald, & Thompson, 2003; Rutz et al., 1989).

Findings also showed that passive attempts at influencing referrals were generally not effective in changing patterns of referrals. This was especially true in terms of passive distribution of materials and providing feedback to physicians. The use of referral or practice guidelines were somewhat effective, at least in situations that involved some type of training or instruction (e.g., Banait et al., 2003; Worrall, Angel, Chaulk, Clarke, & Robbins, 1999).

Conclusion

Findings from this practice-based research synthesis indicate that proactive (as opposed to passive) in-

interventions are more likely to be effective in terms of changing physician referrals to secondary care providers. Two practices in particular—outreach to physicians and organizational interventions—prove to be especially effective. A previously completed practice-based research synthesis on outreach to physicians found that highly active involvement of physicians in changing their prescribing behavior contributed to the effectiveness of interventions (Clow et al., 2005). The organizational interventions found to be effective in this practice-based research synthesis are ones that typically involve attachment of secondary care providers to primary care practices. The common denominators of both kinds of interventions are ongoing and frequent contact with primary referral services and providing services by secondary care providers deemed important by primary care providers.

Implications for Practice

Findings reported in this *Cornerstones* have direct implications for improving child find. First, passive distribution of program materials, including, but not limited to, brochures, videos, and referral guidelines are not likely to be effective child find strategies. Second, interventions that occur infrequently or for a short period of time are not likely to be effective either. Third, effective child find needs to be proactive and include ongoing and frequent face-to-face contact with primary referral sources. Fourth, these proactive interventions are likely to be optimally effective when program materials are used to reinforce face-to-face communication (Dunst, 2006a).

A nontechnical summary of this research synthesis is available in a companion report (*Endpoints, Volume 2, Number 5*). Guidelines for implementing child find practices consistent with the findings from this practice-based research synthesis will be available as a *TRACE Practice Guide*. This practice guide will include additional information about the characteristics of proactive child find that can be used to promote and sustain primary referral source referrals to early intervention and preschool special education. The interested reader should find companion practice guides and guidelines useful as well (Dunst, 2006a, 2006b, 2006c).

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Table 1
Studies Included in Each Research Synthesis and the (Estimated) Numbers of Study Participants

Study	Research Review		Number ^a					
	Grimshaw et al. (2005)	Faulkner et al. (2003)	Intervention Group			Control Group		
			Patients	Physicians	Practices	Patients	Physicians	Practices
Abu-Ramadan (2002)	X		– ^b	40	–	–	–	–
Atherton-Naji et al. (2001)		X	24	–	(3)	21	–	(2)
Banait et al. (2003)	X		–	–	33	–	–	81
Bennett et al. (2001)	X	X	–	(134)	38	–	(43)	12
Bertakis & Robbin (1987)	X		520	–	–	–	–	–
Blair et al. (1997)		X	100	–	–	100	–	–
Delaney et al. (2001)		X	285	–	–	193	–	–
Donohoe et al. (2000)		X	950	–	–	950	–	–
Ellman et al. (1982)		X	110	–	–	112	–	–
Fender et al. (1999)		X	–	–	54	–	–	46
French et al. (1990)		X	–	100	–	–	100	–
Gentle et al. (1984)		X	123	–	–	107	–	–
Gilliam et al. (1995)		X	1,309	–	17	1,187	–	17
Grimshaw (1998)	X		–	(58)	–	–	(58)	–
Hackett et al. (1993)		X	183	–	1	218	–	2
Harvey et al. (1998)		X	111	–	–	51	–	–
Hemmings (1997)		X	136	–	–	52	–	–
Hobbs et al. (1996)		X	–	–	21	–	–	4
Jones et al. 1999)		X	165	31	6	92	33	9
Jones et al. (1993)	X		–	(90)	(23)	–	(90)	(23)
Kendrick et al. (1995)		X	184	–	–	189	–	–
Kinnersley et al. (1999)	X	X	177	–	8	145	–	7
Linnala et al. (2001)	X	X	–	10	2	–	4	2
Mackie & Hole (1992)		X	–	–	–	–	–	–
McKechnie et al. (1981)		X	–	–	1	–	–	1
Moayyedi et al. (1999)		X	260	–	–	–	–	–
Morrison et al. (2001)	X	X	(345)	(299)	113	(345)	(299)	101
Nichols & Waters (1984)		X	–	–	–	–	–	–
Oakeshott et al. (1994)		X	–	–	30	–	–	32
O’Cathrin et al. (1995)	X	X	–	–	6	–	–	35
Power et al. (1990)		X	(82)	–	–	19	–	–
Rink et al. (1993)		X	65	–	–	124	–	–
Rutz et al. (1989)		X	–	18	–	–	–	–
Thomas et al. (2003)	X		–	–	(38)	–	–	(38)
Thomson et al. (1999)		X	497	–	–	500	–	–
Tucker et al. (1996)		X	878	–	–	887	–	–
Tyrer et al. (1990)		X	8,245	–	–	–	–	–
Vierhout et al. (1995)	X		(136)	–	(6)	(136)	–	(6)
Wells et al. (1992)		X	282	–	1	2,294	–	–
Wells & Faragher (1992)		X	–	52	–	–	35	–
Whitehead et al. (1989)		X	272	–	–	–	–	–
Worrall et al. (1999)		X	91	22	–	56	20	–

^aNumbers in parenthesis are estimates based on information included in the Faulkner et al. (2003) and Grimshaw et al. (2005) reports.

^b– = Information was not reported.

Table 2
Interventions Used to Influence Physician Referrals

Study	Length of Intervention (Months)	Frequency of Contacts ^a	Type of Intervention				
			Information Campaigns	Referral/Practice Guidelines	Feedback to Physicians	Outreach to Physicians	Organizational Interventions
Abu-Ramadan (2002)	29	3		X		X	X
Atherton-Naji et al. (2001)	6	1	X				
Banait et al. (2003)	7	2		X		X	
Bennett et al. (2001) (Sample 1)	12	2	X				
Bennett et al. (2001) (Sample 2)	12	2		X			
Bennett et al. (2001) (Sample 3)	12	2	X	X			
Bertakis & Robbins (1987)	24	3					X
Blair et al. (1997)	– ^b	3					X
Delaney et al. (2001)	12	3					X
Donohoe et al. (2000)	6	3				X	
Ellman et al. (1982)	12	3					X
Fender et al. (1999)	12	2	X			X	
French et al. (1990)	10	3			X		
Gentle et al. (1984)	6	3					X
Gilliam et al. (1995)	12	3					X
Grimshaw (1998) (Sample 1)	4	3		X			
Grimshaw (1998) (Sample 2)	4	3	X				
Grimshaw (1998) (Sample 3)	4	3			X		
Hackett et al. (1993)	6	3					X
Harvey et al. (1998)	4	3					X
Hemmings (1997)	4	3					X
Hobbs et al. (1996)	6	3		X			
Jones et al. (1999)	12	3					X
Jones et al. (1993)	6	1		X		X	
Kendrick et al. (1995)	24	2				X	
Kinnersley et al. (1999)	12	3					X
Linnala et al. (2001)	33	2		X			X
Mackie & Hole (1992)	7	1	X				
McKechnie et al. (1981)	24	3					X
Moayyedi et al. (1999)	24	3					X
Morrison et al. (2001)	12	2		X	X	X	
Nichols & Waters (1984)	12	1	X				
Oakeshott et al. (1994)	2	1		X			
O’Cathrin et al. (1995)	9	3					X
Power et al. (1990)	6	3					X
Rink et al. (1993)	6	3					X
Rutz et al. (1989)	6	2	X			X	
Thomson et al. (1999)	6	1	X				
Tucker et al. (1996)	4	3					X
Tyrer et al. (1990)	48	3					X
Vierhout et al. (1995)	12	3		X	X		
Wells et al. (1992)	48	3					X
Wells & Faragher (1992)	36	3				X	
Whitehead et al. (1989)	6	1	X				
Worrall et al. (1999)	6	3		X		X	X

^a1 = Once, 2 = A few times, 3 = Multiple contacts/many times.

^bInformation could not be determined.

Table 3
Research Designs, Type of Comparisons, and Estimated Sizes of Effect on the Study Outcomes

Study	Research Design	Type of Comparison	Referral Outcome	Percent Difference ^a
Abu-Ramadan (2002)	Interrupted time series	Pre vs. Post ^b	Rate	(+35)
Atherton-Naji et al. (2001)	Randomized controlled trial	E vs. C ^c	Number	-2
Banait et al. (2003)	Randomized controlled trial	E vs. C	Rate	(+35)
Bennett et al. (2001) (Sample 1)	Randomized controlled trial	E vs. C	Appropriateness	(+13)
Bennett et al. (2001) (Sample 2)	Randomized controlled trial	E vs. C	Appropriateness	(+24)
Bennett et al. (2001) (Sample 3)	Randomized controlled trial	E vs. C	Appropriateness	(-50)
Bertakis & Robbins (1987)	Randomized controlled trial	E1 vs. E2	Number	(+13)
Blair et al. (1997)	Observational controlled	E vs. C	Odds ratio	+56
Delaney et al. (2001)	Randomized controlled trial	E vs. C	Rate	+20
Donohoe et al. (2000)	Randomized controlled trial	E vs. C	Appropriateness	(+12)
Ellman et al. (1982)	Observational controlled	E vs. C	Number	+68
Fender et al. (1999)	Randomized controlled trial	E vs. C	Appropriateness	-9
French et al. (1990)	Observational controlled	E vs. C	Number	(0)
Gentle et al. (1984)	Randomized controlled trial	E vs. C	Appropriateness	+39
Gilliam et al. (1995)	Observational controlled	E vs. C	Rate	(+60)
Grimshaw (1998) (Sample 1)	Controlled clinical trial	E vs. C	Number	(0)
Grimshaw (1998) (Sample 2)	Controlled clinical trial	E vs. C	Number	(-36)
Grimshaw (1998) (Sample 3)	Controlled clinical trial	E vs. C	Number	(0)
Hackett et al. (1993)	Observational controlled	E vs. C	Odds ratio	(0)
Harvey et al. (1998)	Randomized controlled trial	E vs. C	Number	+14
Hemmings (1997)	Randomized controlled trial	E vs. C	Appropriateness	+45
Hobbs et al. (1996)	Controlled before and after	E vs. C	Odds ratio	+40
Jones et al. (1999)	Randomized controlled trial	E vs. C	Number	+13
Jones et al. (1993)	Randomized controlled trial	E vs. C	Rate	(+14)
Kendrick et al. (1995)	Randomized controlled trial	E vs. C	Number	+26
Kinnersley et al. (1999)	Randomized controlled trial	E vs. C	Number	(+10)
Linnala et al. (2001)	Controlled clinical trial	E vs. C	Rate	+28
Mackie & Hole (1992)	Interrupted time series	Pre vs. Post	Odds ratio	+73
McKechnie et al. (1981)	Observational controlled	E vs. C	Rate	+17
Moayyedi et al. (1999)	Interrupted time series	Pre vs. Post	Rate	+37
Morrison et al. (2001)	Randomized controlled trial	E vs. C	Rate	(0)
Nichols & Waters (1984)	Interrupted time series	Pre vs. Post	Number	(+5)
Oakeshott et al. (1994)	Randomized controlled trial	E vs. C	Number	(+18)
O’Cathrin et al. (1995)	Controlled before and after	E vs. C	Rate	+17
Power et al. (1990)	Randomized controlled trial	E vs. C	Rate	+18
Rink et al. (1993)	Observational controlled	E vs. C	Number	+14
Rutz et al. (1989)	Interrupted time series	Pre vs. Post	Number	(+36)
Thomas et al. (2003)	Randomized controlled trial	E vs. C	Number	(0)
Thomson et al. (1999)	Randomized controlled trial	E vs. C	Number	+2
Tucker et al. (1996)	Randomized controlled trial	E vs. C	Odds ratio	+13
Tyrer et al. (1990)	Controlled before and after	Pre vs. Post	Number	+16
Vierhout et al. (1995)	Randomized controlled trial	E vs. C	Rate	+33
Wells et al. (1992)	Controlled before and after	E vs. C	Rate	+2
Wells & Faragher (1992)	Interrupted time series	E vs. C	Number	(+75)
Whitehead et al. (1989)	Interrupted time series	Pre vs. Post	Number	(+43)
Worrall et al. (1999)	Randomized controlled trial	E vs. C	Number	+12

^aNumbers in parenthesis are estimated percent differences calculated from information in the Faulkner et al. (2003) and Grimshaw et al. (2005) reports.

^bPre = pre-intervention, Post = post-intervention.

^cE = experimental group, C = control or comparison group.

Table 4
Effect Sizes for the Study Characteristics and Interventions

Variables	Number of Effect Sizes	Mean Effect Size	Confidence Interval (95%)
<i>Study Characteristics</i>			
Research Design			
Randomized clinical trials	24	13.04	5.11–20.98
Controlled trials ^a	11	18.82	-2.46–40.09
Before/after studies ^b	11	34.45	18.26–50.65
Sample Size			
Small (less than 100 patients)	12	31.17	15.99–46.35
Medium (100 to 300 patients)	25	13.24	3.64–22.84
Large (more than 300 patients)	7	16.57	-2.00–35.14
Type of Comparison			
E vs. C	38	16.87	8.73–25.00
Pre vs. Post	7	35.00	15.11–54.89
Referral Outcome			
Number	21	15.57	4.49–26.66
Rate	13	24.31	14.58–34.04
Appropriateness	7	10.57	-19.24–40.38
Odds ratio	5	36.40	-0.90–73.70
<i>Intervention Characteristics</i>			
Length of Intervention (Months)			
6 or less	19	14.84	5.27–24.42
7-12	17	18.35	2.90–33.80
13 or more	9	27.67	11.57–43.76
Frequency of Contact			
Once	7	21.86	-3.15–46.86
Few times	9	11.44	-9.83–32.72
Many	30	21.43	12.61–30.25
Type of Intervention			
Information campaigns	10	7.50	-18.61–33.61
Referral/practice guidelines	13	14.54	0.03–29.04
Feedback to physicians	4	8.25	-18.01–34.51
Outreach to physicians	10	23.60	6.67–40.53
Organizational interventions	22	24.86	16.55–33.18

^aIncludes both controlled clinical trials and observational controlled trials.

^bIncludes interrupted time series design studies.