

Is default from colposcopy a problem, and if so what can we do? A systematic review of the literature

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SUMMARY

It has been reported that many women referred to outpatient colposcopy clinics fail to attend for their appointments. The aim of this paper is to search the literature to assess the extent of default from colposcopy and to identify interventions, suitable for implementation within primary care, to reduce the proportion of women defaulting. Searches were performed on MEDLINE, PsychLIT, Bids and Cancerlit from 1986 to September 1997 using the terms colposcopy or cervical/Pap smear in association with default, non-attendance, adherence, patient compliance, treatment refusal, patient dropouts, attendance, barriers or intervention. The inclusion criteria for primary papers were that they contained data that enables the calculation of default rates for colposcopy or the results of interventions aimed at improving the default rates. Thirteen publications describing default rates and four describing interventions were included as primary papers. Combining the data from these studies suggests default rates of 3%, 11%, and 12% for assessment/treatment visits, first review, and second review respectively. The intervention studies suggested a need to tailor the intervention to the population and the type of information to suit the individual. Varying definitions make comparison of default rates difficult, and the use of a crude non-attendance rate may result in an overestimate of default rates. The vast majority of women invited to colposcopy eventually attend. It is questionable if there is a need for interventions to increase compliance. Where necessary, greater cooperation across the primary/secondary care interface and use of the extended primary care team may be a more cost-effective means of increasing compliance.

Keywords: colposcopy; non-attendance; patient compliance; treatment refusal.

Introduction

THE development of the Papanicolaou smear was a breakthrough in the detection of premalignant disease and was heralded as a means of preventing cervical cancer.¹ Attempts to reduce the morbidity and mortality related to this cancer have revolved around the development of a primary care-based cervical screening programme,²⁻⁴ and coverage of the target population has increased from 61% in 1989-90 to 85% in 1996-97.^{5,6} More than 4.4 million smears tests were performed in 1996-97, of which 6% showed a degree of abnormality resulting in recommendations for regular cytological surveillance or referral for

colposcopy. However, despite all this activity, in England and Wales there are still approximately 3500 new tumours and 1650 deaths every year attributable to neoplasms of the cervix uteri; cervical cancer is the seventh most common invasive tumour in women and the most common tumour diagnosed in women under the age of 35 years.^{5,7,8}

The authors' interest in this area was stimulated by reports that approximately a quarter of women referred to outpatient colposcopy clinics failed to attend for their appointments.⁹⁻¹³ The success of cervical cancer screening programmes is dependent both on the proportion of women who attend for screening and on the adequate assessment, treatment, and follow-up of women found to have cervical abnormalities.¹⁴ From a primary care perspective, following up women who default from the recommended course of action can have a significant impact on the workload of general practitioners, practice nurses, and secretaries. To ensure that National Health Service resources are used in the most cost-effective manner, it is important to have reliable information on default rates and on interventions that can increase the proportion of women who attend colposcopy. This literature review aims first to assess the extent of default from colposcopy, and then to identify interventions, suitable for implementation within primary care, that would reduce the proportion of women defaulting from colposcopy.

Method

Searches were performed on the following computer databases: MEDLINE, PsychLIT, Bids (Bath University ISI database), and Cancerlit from 1986 to September 1997, using the terms colposcopy or cervical/Pap smear (exploded) in association with default, non-attendance, adherence, patient compliance, treatment refusal, patient dropouts, attendance, barriers or intervention. The Cochrane Library database (1997, Issue 3) was also used as part of the search strategy. These searches were supplemented by hand searches of the major United Kingdom (UK) and United States (US) primary care and obstetrics and gynaecology journals, and by scanning the reference lists of all articles found through the above strategies. Grey literature, including conference proceedings from the British Society of Colposcopy and Cervical Pathology, was searched for research in progress. All references were stored on a database using the bibliographic software package, Reference Manager.

Both authors scanned the titles and, where available, the abstracts of all articles identified by the searches in order to exclude those that had no relevance to colposcopy. Complete copies of all remaining papers were obtained to identify all publications relating to default or interventions in a colposcopy clinic. Primary papers included were those that contained data to enable the calculation of default rates for colposcopy, or the results of interventions aimed at improving these default rates. Complete citation tracking was undertaken, with no time limit from the selected primary papers.

Articles selected as primary papers were assessed independently by the authors, who judged the papers using a protocol adapted from a previously published systematic review.¹⁵ The four criteria

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Submitted: 16 March 1998; final acceptance: 12 August 1998.

© British Journal of General Practice, 1999, 49, 223-229.

used for assessment were appropriate sample composition, appropriate methodology, sufficient description of the method to permit replication, and appropriate outcome measures. Disagreements about papers were discussed and a consensus reached.

Results

The literature search

The literature searches identified 134 unique references, of which 100 were not relevant to the aims of this review.¹ Twenty-eight papers were identified that included information on the proportion of women who defaulted from colposcopy. Fifteen of these papers were not included as primary papers because the method of determining the default rate was inadequately described.^{9-11,13,16-26} Thirteen publications describing default rates were included as primary papers, of which six related to women referred for colposcopy^{12,14,27-30} and seven included only those women who had attended their first colposcopy appointment³¹⁻³⁷ (Table 1).

Six papers were identified that related to the effectiveness of interventions aimed to improve compliance with colposcopy appointments. Two of these publications were not included as primary papers because the methodology was inadequately described.^{25,28} Only four publications were eligible to be included as primary papers^{19,30,38,39} (Table 2).

What is the extent of default from colposcopy?

The 13 primary papers describing default rates are detailed in Table 1. Most of these primary papers relate to studies developed for purposes other than the measurement of default. Only five of these papers stated that their primary aim was to examine the extent of non-attendance at colposcopy clinics and only three of the studies were based in the UK.^{14,27-29,33} Default rates based on studies designed to evaluate treatment^{12,31,32,34-37} on selected groups of patients³³ or interventions aimed to improve attendance at colposcopy³⁰ must be interpreted with caution.

The 13 primary studies identified report default rates for the initial appointment ranging from 0.4% to 47.3%; the lower attendance rates were reported by a US study based on a deprived population in which more than half the sample were required to arrange their own colposcopy appointments^{29,30} (Table 3). Overall attendance rates are difficult to interpret as default rates vary depending on whether the appointment is for assessment, treatment, or review.^{27,29} The proportion of patients who default increases with successive follow-up appointments.^{27,29,32}

Combining the data for 12 of the 13 primary studies (i.e. excluding data from the one study with very different results and appointment practices³⁰) enables the calculation of combined attendance rates. The best estimation of default rates is 3% (95% CI = 2.1% to 4.1%) for assessment and treatment, and 11% and 12% for the first and second review respectively (Table 3).

As well as varying by follow-up visit, default rates vary according to the time that has elapsed since the invitation was issued.^{27,29} A UK study reported that, although default rates for specific appointments were about 20%, only 1% of women had not attended for their assessment visit and only 5% had not attended for their initial review 12 months after the original appointment.²⁷ Similarly, Australian studies have reported that a large proportion of women (6% to 24%) attend colposcopy more than three months after the original appointment.^{23,26}

There is conflicting evidence as to whether default rates vary by treatment modality; a Canadian study ($n = 2773$) reports default rates of 5.8% in patients treated by cryotherapy and 14.0% for those treated by laser,³⁴ whereas an American study ($n = 1092$) reported that patients treated by conization or laser were

more likely to attend their next appointment than those treated by cryotherapy.²⁵ Similar discrepancies in findings relate to whether default rates vary by grade of abnormality. Some studies have reported higher default rates in patients for whom the cytology or initial biopsy was suggestive of more severe disease,^{27,34} but other studies have contradicted these findings.^{17,25,33}

Why do women default from colposcopy?

Studies that address the reasons why women default from colposcopy clinics highlight a number of recurring themes. Default rates have been associated with younger age,^{21,25} lower social class,^{16,21} not having private medical insurance,^{9,14} not having further educational training,¹⁴ lack of understanding about colposcopy,²¹ and simply forgetting the appointment.^{25,30} Defaulters were more likely to have child care responsibilities, particularly for children under school age, and were more likely to be single parents.³⁰ Pregnancy also appears to be an important factor in defaulting from colposcopy appointments, with women reporting a fear that colposcopy will increase the risk of miscarriage.^{21,25,27,29}

More than one half (52%) of the women in one study reported having concerns about undergoing colposcopic examination.³⁰ Anxiety has been suggested by several authors as an important issue in determining compliance with colposcopy.^{14,18,21,25,40-43} 'Precolposcopy clinics' have been suggested as one mechanism for enabling women to ask questions and have an opportunity to discuss anxieties with health professionals prior to a colposcopy appointment.⁴⁰ Video facilities to enable women to observe the colposcopy procedure have been used to inform and reassure women about the procedure,⁴⁴ and watching music videos has been shown to decrease anxiety in adolescents having colposcopy.⁴⁵ However, although there is evidence of the anxiety caused by colposcopy⁴⁶⁻⁵¹ and of the effectiveness of interventions to reduce anxiety,⁴⁵ we identified no research evidence to confirm that decreasing anxiety levels lead to increased compliance with colposcopy.

Interventions to increase compliance with colposcopy

The four primary papers evaluating interventions aimed at increasing compliance with colposcopy are detailed in Table 2.

Lauer *et al* describe an intervention giving information about the need for colposcopy in a positive and a negative manner, and concluded that factors other than 'optimism' may be more relevant to follow-up, particularly for a disadvantaged population.¹⁹ This finding was supported by Marcus *et al* in a randomized controlled trial which reported that transport incentives of bus passes and parking permits were the most effective intervention among a socioeconomically deprived population.³⁹

The use of the telephone has been evaluated as an intervention to improve colposcopy attendance rates. Lermann found that the telephoned group were significantly more likely to attend the rescheduled appointment,³⁸ and Miller *et al* found that telephone counselling had a greater effect on attendance than confirmation of the appointment alone, which in turn was more effective than standard care.³⁰ However, the cost-effectiveness of attempting up to 10 telephone calls to contact every patient is questionable. Of greater practical application may be the simple finding that approximately half of women who fail to be contacted by telephone or letter to confirm their appointment subsequently default, which may provide support for deliberately overbooking colposcopy clinics to increase the efficiency of the service.²⁸

Discussion

This review has raised a number of important issues. Existing

Table 1. Default rates from colposcopy.

Study	Population	Attendance rate definition	Attendance rate	Comments
Patterson et al 1995 ²⁷	Fife, Scotland; 1999; new referrals to colposcopy; n = 200. Persistent CIN I or a single smear reported as CIN II or CIN III. Non-attenders sent up to three reminders then GP asked to intervene.	Proportion of eligible women who attended. Analysis by life table method to allow for changes in the denominator.	Assessment ^a : 90% First review: 81% Second review: 80%	Good paper suggesting that most women eventually attend for their colposcopy appointment. Sample size insufficient to examine the characteristics of non-attenders but women failing to attend for review appointments appear to have more severe disease than attenders.
Mitchell et al 1992 ²⁹	Melbourne, Australia; 1988; systematic sample of women booked to attend the dysplasia clinic (mixture of new referrals and repeat appointments); n = 251.	Proportion of women who failed to ever attend within 18 months of appointment	Assessment: 99.6% Treatment: 98.8% Review: 81.0%	Series comprised a sample of appointments made in 1988 and included women who had already attended for four or more appointments. Of the 50 cases that DNA'd, 45 attended the dysplasia clinic at least once. Four of the five women who never attended were internal referrals from other Women's clinics.
Miller et al 1997 ³⁰	Philadelphia, USA; 1992-95; new referrals to two colposcopy clinics, excluding women with history of cervical cancer or with smear suggestive of cancer; n = 573.	Proportion of eligible women who attended within six months of original appointment	Assessment ^a : 52.7% First review: 47.8%	Sample had a high proportion of women from low-income, inner-city areas. The primary aim of this study was to assess the effect of a telephone intervention aiming to increase attendance rates. These 573 women received standard care; attendance rates in the intervention group were significantly higher.
Kavanagh and Simpson, 1996 ¹⁴	Canberra, Australia; 1989-90; consecutive series of new referrals to a private outpatient colposcopy service, excluding women who had previously seen a gynaecologist; n = 493. Follow-up to August 1991.	Proportion of eligible women who attended. Default rate per 100 women-months of follow-up = 2.2 women/100 women-months.	Treatment: 98.4% First review: 81.4% Scheduled ^b : 79.3%	Retrospective cohort study.
Jones et al 1992 ¹²	London, England; 1986-87; Mild dyskaryosis. No information on reminder policy. Women under cytological surveillance; n = 203. Referrals to colposcopy; n = 205.	Proportion of women who ever attended.	Ever attended: 70.9% Ever attended: 66.8%	Retrospective study comparing loss to follow-up different management strategies; cytological surveillance and immediate colposcopy.
Woolley and Hicks, 1997 ²⁸	Sheffield, UK; 1988-90; all appointments booked at a colposcopy clinic; n = 973. No information on reminder policy	Proportion of women who attended the booked appointment	Attended: 76.6%	Audit of genitourinary based colposcopy service.
Flannely et al 1994 ³²	Aberdeen, Scotland; 1989-91; women who attended colposcopy and agreed to enter a trial of management strategies; n = 192. Mild or moderate dyskaryosis. Women withdrawn from study on progression to severe dyskaryosis (treated and no further follow-up information available). Reviews six-monthly; no information on reminder policy.	Proportion of women who attended	First review: 88.5% Second review: 80.3% Two-year review: 63.2%	Aim of study was comparison of immediate treatment and surveillance. Population unrepresentative (less severe disease) than usual colposcopy referrals. Unsurprising that 37% had DNA'd by the two-year follow-up visit as these were women who had already had three negative colposcopies.

^aAssessment and treatment visit; ^bas recommended by their gynaecologist; ^clarge loop excision of the transformation zone.

Table 1. (cont) Default rates from colposcopy.

Study	Population	Attendance rate definition	Attendance rate	Comments
Benedet et al 1995 ²⁷	Vancouver, Canada; 1984-89; women who had attended colposcopy and received treatment; n = 2773. CIN I with persistent dysplasia and CIN II-III confirmed by colposcopic biopsy.	Proportion of women with complete follow-up; three months post treatment and four- to five-monthly.	Follow-up: 88.8%	Retrospective study aiming to compare cryotherapy and laser surgery in the treatment of CIN.
Woolley and Talbot, 1990 ³³	Sheffield, England; 1984-87; new referrals to genitourinary medicine clinic who had abnormal result on routine smear; n = 508. Mild dyskaryosis sent one reminder; moderate to severe dyskaryosis sent two reminders. Non-attenders with severe dyskaryosis referred to health visitor.	Proportion of women who eventually attended.	Follow-up: 76.8%	Cohort study aiming to assess the extent of default in a GUM clinic. Unrepresentative of routine colposcopy referrals.
Flannelly et al 1997 ³⁵	Aberdeen, Scotland; 1989-91; consecutive series of women treated by LLETZ ^c ; n = 1000 Follow-up: four months post-treatment and smear and colposcopy seven months after treatment	Proportion of eligible women attending for repeat smear	First review: 97.5% Second review: 92.6%	Retrospective study aiming to assess the extent of treatment failures and compare cryology and colposcopy as methods of follow-up.
Denny et al 1995 ³¹	Cape Town, South Africa; 1991-92; new referrals having attended colposcopy and had a punch biopsy performed. CIN II-III or persistent CIN I on smear. Positive punch biopsy; n = 123. Negative punch biopsy; n = 61.	Proportion of women who returned for their next appointment.	Treatment: 94.3% Review: 86.9%	Retrospective study aiming to compare biopsy and treatment with see and treat.
Spitzer et al 1993 ³⁷	New York, USA; 1990-92; women who attended colposcopy and received treatment by LLETZ ^c ; n = 236. CIN I-III. Follow-up: two-week postoperative check-up and four- to six-month follow-up.	Proportion of eligible women who attended for follow-up.	First review: 74.6% Second review: 74.4%	Cohort study aiming to assess the feasibility of treatment by LLETZ.
Ferenczy et al 1996 ³⁶	Montreal, Canada; 1990-94; consecutive referrals to colposcopy clinic; n = 1189 Follow-up: three- to six-month intervals post-treatment.	Proportion of women who attended for follow-up.	First review: 90.0%	Cohort study aiming to compare traditional two-step procedure (biopsy then treat) with 'see and wait' (LLETZ)

^aAssessment and treatment visit; ^bas recommended by their gynaecologist; ^clarge loop excision of the transformation zone.

Table 2. Interventions.

Study	Population	Attendance rate definition	Attendance rate	Comments
Lauver and Rubin, 1990 ¹⁹	Pennsylvania, USA; n = 116. Low income women; 94% black. Smears indicated either CIN or HPV. Colposcopy was in a secondary care setting. Cohort design.	Message framing and dispositional optimism on follow-up.	Attendance within six weeks of contract.	N/S effect on attendance.
Marcus et al 1992 ³⁹	Los Angeles, USA; 1984-86; n = 2044. Low income women; 69% Hispanic or black. Smears ranged from inadequate to invasive carcinoma. Follow-up smear or colposcopy in one of 12 hospital or community based clinic. RCT, 2 2 2 factorial design.	Educational pamphlet and personalized letter or slide tape programme or transportation incentive.	Return clinic visit for follow-up care.	Transport incentive best as single intervention P<0.05 combined letter and tape had positive effect on follow-up P<0.01.
Miller et al 1997 ³⁰	Philadelphia, USA; 1992-95; n = 828. Low income women, 86% black. Smears ranged from atypia to carcinoma in situ. Smears suggestive of carcinoma were excluded. Colposcopy in secondary care. RCT.	Telephone counselling with or without a booster call or telephone confirmation call or standard care.	Adherence within six months of original appointment.	Counselling more effective than confirmation more effective than standard care.
Lerman et al 1992 ³⁸	Philadelphia, USA; n = 90. Low income women, 85% black and 92% unmarried. Smears reported as class 3-5. Colposcopy in secondary care. RCT.	15-minute structured telephone counselling protocol or standard care for women who had defaulted once from colposcopy follow-up.	Compliance with re-scheduled colposcopy appointment.	67% of intervention group complied with rescheduled appointment compared with 43% of the control group; P<0.05.

Table 3. Overall estimated default rates.

Visit	Studies	Number	Attendance rate (%)	Weighted attendance rate (%) ^a
Assessment and treatment	Mitchell et al 1992 ²⁹	251	99.6	97.0
	Patterson et al 1995 ²⁷	200	90.0	
	Mitchell et al 1992 ^{29b}	250	98.8	
	Kavanagh and Simpson 1996 ¹⁴	493	98.4	
	Denny et al 1995 ³¹	123	94.3	
First review	Patterson et al 1995 ²⁷	180	81.0	88.7
	Kavanagh and Simpson 1996 ¹⁴	485	81.4	
	Flannelly et al 1994 ³²	192	88.5	
	Flannelly et al 1997 ³⁵	1000	97.5	
	Denny et al 1995 ³¹	61	86.9	
	Spitzer et al 1993 ³⁷	236	74.6	
	Ferenczy et al 1996 ³⁶	1189	90.0	
	Mitchell et al 1992 ²⁹	247	81.0	
Second review	Patterson et al 1995 ²⁷	146	80.0	87.8
	Flannelly et al 1994 ³²	170	80.3	
	Flannelly et al 1997 ³⁵	975	92.6	
	Spitzer et al 1993 ³⁷	176	74.4	

^aOverall attendance rate calculated by combining all available data for this visit; ^btreatment after assessment.

published research inadequately defines the extent and clinical outcome of default from colposcopy in the UK or the effectiveness of different interventions. Most of the studies identified by this review have used a crude non-attendance rate, which at best gives the ratio of the total number of women failing to attend to the number of invitations issued, and at worst indicates the pro-

portion of the total study population for which complete follow-up is available.^{10,12,17,28,34} Other studies calculated default rates per 100 women-months of follow-up: such rates may be the ideal way of providing data for comparative purposes, but they fail to describe adequately the number of women who may be at risk after failing to follow treatment or follow-up recommendations.¹⁴

The variation in definition of default rates makes comparison of rates difficult, and the use of a crude non-attendance rate may result in an overestimate of the final default rate from treatment. If 99% of patients attend for assessment and treatment^{27,29} and only a small proportion of the non-attenders are likely to have intra-epithelial neoplasia, the extent of untreated disease may not be sufficient to warrant the allocation of further resources.²³ This impression is supported by a study of 206 women with CIN II-III on cytology; of the 13 (6.3%) women who did not attend for assessment, five were seen by another gynaecologist, three had a repeat smear that was normal, three moved out of the area, and two were lost to follow-up before they got the smear results. Overall, 85% (11/13) of suspected defaulters had adequate management and the 2/206 (1%) who did not attend were attributable to deficiencies in the system that failed to inform the women in time.²³

Default rates increase with increasing periods of follow-up;^{27,29,32} this is most probably because, after treatment, women often perceive their risk of cervical cancer as being reduced or negligible.^{14,52} The limited number of studies that have evaluated colposcopy-based interventions have concentrated on educating women. Future initiatives may be more efficient if they emphasize the importance of post-treatment care. However, before interventions are implemented it is necessary to confirm that patient factors, as opposed to provider factors, determine re-attendance rates, and that these factors are amenable to change.^{53,54}

Although a number of studies have examined methods of increasing women's compliance with repeat smear tests,^{39,55-59} little work has been done to evaluate interventions aiming to increase compliance with colposcopy. Studies examining the reasons why women default from general outpatient appointments support the limited evidence from the colposcopy intervention studies^{19,30,38,39} in suggesting a need to tailor the intervention to the population,⁶⁰ and the need to tailor information to the individual patient.⁶¹ Although such interventions are possible in a primary care setting, they would require extra funding for the additional manpower and resources. Based on the evidence in this review, the authors suggest that further evaluation of interventions aimed to improve attendance at colposcopy should not be undertaken until there is firmer evidence that default rates pose a significant clinical and administrative problem.

If future research demonstrates that default rates in some areas are sufficiently high to warrant concern, a number of primary care based initiatives that encourage compliance with colposcopy should be considered. Health professionals within the primary care team can play a key role in reducing anxiety. Providing women with user-friendly information about their smear result at the time of notification has been shown to reduce anxiety and improve general well-being.^{59,62} Locally agreed protocols between general practitioners and the colposcopy clinic could help to ensure that information about an abnormal smear and the need for colposcopic follow-up is given appropriately, as well as reducing the duplication of workload. Improved communication across the primary/secondary care interface may also help to keep waiting times for colposcopy to a minimum, a factor implicated in default rates and in generating anxiety.⁶³ Young women are a highly mobile population,⁶⁴ and practice secretaries have an important role in the notification of changes of address and therefore in the maintenance of continuing care.

Few studies have investigated why women default from colposcopy, and few have accurately described the level of non-attendance. The authors suggest that non-attendance rates should be consistently reported (using patients as the denominator rather than invitations) and should allow for some women missing the

initial appointment but attending subsequently. Attendance rates should be the proportion of women who attend within six or 12 months of the original invitation, should allow for the changing denominator (some of the original cohort will move out of the area or be discharged), and should be calculated using the actuarial method.^{27, 65} Overall default rates (combining defaults for assessment, treatment, and review) have little clinical significance, and we suggest that rates should be separately reported.

It would appear that, although crude non-attendance rates for colposcopy may be substantial, most women attend within 12 months of their initial appointment. The defaulting patient should perhaps be thought of in terms of an inefficient use of NHS resources rather than as a cause of unnecessary morbidity or mortality. The lack of consensus on the clinical effect of default from colposcopy raises questions regarding the need for costly and time-consuming interventions. Greater cooperation across the primary/secondary care interface and use of the extended primary care team may be a more realistic, cost-effective, and attainable ambition for increasing compliance.

Key points

- Existing research inadequately defines the extent and clinical outcome of default from colposcopy in the UK, and the effectiveness of different interventions.
- Although crude non-attendance rates for colposcopy may be substantial, most women attend within 12 months of their initial appointment
- If further research shows that default rates are high, cooperation across the primary/secondary care interface and use of the extended primary care team may be the most realistic, cost-effective, and attainable mechanisms for increasing compliance with colposcopy.

References

1. Papanicolaou G, Traut HF. *The diagnosis of uterine cancer by the vaginal smear*. New York: Commonwealth, 1943.
2. Department of Health. *Cervical cancer screening*. Health circular. HC(88). London: DoH, 1988.
3. Reid GS, Robertson AJ, Bissett C, *et al*. Cervical screening in Perth and Kinross since introduction of the new contract. *BMJ* 1991; **303**: 447-450.
4. Wilkinson C. Abnormal cervical smear test results: old dilemmas and new directions. *Br J Gen Pract* 1992; **42**: 336-339.
5. Austoker J. Cancer prevention in primary care: Screening for cervical cancer. *BMJ* 1994; **309**: 241-247.
6. Department of Health. *Cervical screening programme, England: 1996-97*. Statistical Bulletin 1997/27. London: DoH, 1998.
7. ONS. Monitor: *Registrations of cancer diagnosed in 1992*. MB1 97/1. London: ONS, 1997.
8. Office for Population Censuses and Surveys. *Mortality statistics: Cause, England & Wales 1992*. DH2 No 19. London: HMSO, 1993.
9. Eger RR, Peipert JF. Risk factors for noncompliance in a colposcopy clinic. *J Reprod Med* 1996; **41**: 671-674.
10. Murphy M, Pomeroy L, Tynan M, *et al*. Cervical cytological screening in HIV-infected women in Dublin - a six year review. *Int J STD AIDS* 1995; **6**: 262-266.
11. Bailie R, Barron P, Learmonth G. Towards a rational cervical cytology screening strategy. *S Afr Med J* 1995; **85**: 30-33.
12. Jones MH, Jenkins D, Cuzick J, *et al*. Mild cervical dyskaryosis: safety of cytological surveillance. *Lancet* 1992; **339**: 1440-1443.
13. Montz FJ, Bradley J, Monk J, *et al*. Natural history of the minimally abnormal papanicolaou smear. *Obstet Gynecol* 1992; **80**: 385-388.
14. Kavanagh AM, Simpson JM. Predicting nonattendance for colposcopy clinic follow-up after referral for an abnormal Pap smear. *Aust NZ J Pub Health* 1996; **20**: 266-271.
15. Hobbs FDR, Delaney BC, Fitzmaurice DA, *et al*. *A review of near patient testing in primary care*. Health Technology Assessment, vol 1. Winchester: National Health Service Executive, 1997.
16. Laedtke TW, Dignan M. Compliance with therapy for cervical dysplasia among women of low socioeconomic status. *South Med J* 1992; **85**: 5-8.

17. Nathan PM, Moss TR. Screening colposcopy in genitourinary medicine. *Int J STD AIDS* 1991; **2**: 342-345.
18. Lerman C, Miller SM, Scarborough R, *et al.* Adverse psychologic consequences of positive cytologic cervical screening. *Am J Obstet Gynecol* 1991; **165**: 658-662.
19. Lauer D, Rubin M. Message framing, dispositional optimism, and follow-up for abnormal Papanicolaou tests. *Res Nursing & Hlth* 1990; **13**: 199-207.
20. Shen RN, Hicks DA, Cruickshank ME. Colposcopy services provided by genito-urinary medicine clinics in the United Kingdom - British Society for Colposcopy and Cervical Pathology/National Coordinating Network Survey, 1993. *Int J STD AIDS* 1996; **7**: 98-101.
21. Sanders G, Craddock C, Waggstaff I. Factors influencing default at a colposcopy clinic. *Qual Health Care* 1992; **1**: 236-240.
22. Singer A. Abnormal cervical smear. *BMJ* 1986; **293**: 1551-1556.
23. Towler BP, Irwig LM, Shelley JM. Adequacy of management of women with CIN 2 and pap smear abnormalities. *Med J Aust* 1993; **159**: 523-528.
24. Ferris DG, Hainer BL, Pfenninger JL, *et al.* Electrosurgical loop excision of the cervical transformation zone: the experience of family physicians. *J Fam Pract* 1995; **41**: 337-344.
25. Cartwright PS, Reed G. No-show behaviour in a county hospital colposcopy clinic. *Am J Gynecological Health* 1990; **4**: 15-21.
26. Schofield MJ, Sanson Fisher R, Halpin S, Redman S. Notification and follow-up of Pap test results: current practice and women's preferences. *Prev Med* 1994; **23**: 276-283.
27. Patterson T, Roworth M, Hill M. An investigation into the default rate at the Fife colposcopy clinic: implications for target setting. *J Pub Hlth Med* 1995; **17**: 65-69.
28. Woolley PD, Hicks DA. Audit of a genitourinary-based colposcopy service. *Int J STD AIDS* 1997; **8**: 63.
29. Mitchell H, Hoy J, Smith MT, Quinn M. A study of women who appear to default from management of an abnormal pap smear. *Aust NZ J Obstet Gynaecol* 1992; **32**: 54-56.
30. Miller SM, Siejak KK, Schroeder CM, *et al.* Enhancing adherence following abnormal pap smears among low-income minority women: A preventive telephone counseling strategy. *J Natl Cancer Inst* 1997; **89**: 703-708.
31. Denny LA, Soeters R, Dehaeck K, Bloch B. Does colposcopically directed punch biopsy reduce the incidence of negative LLETZ? *Br J Obstet Gynaecol* 1995; **102**: 545-548.
32. Flannely G, Anderson D, Kitchener HC, *et al.* Management of women with mild and moderate cervical dyskaryosis. *BMJ* 1994; **308**: 1399-1403.
33. Woolley PD, Talbot MD. Experience in Sheffield: follow-up of abnormal cervical cytology. *Int J STD AIDS* 1990; **1**: 95-97.
34. Benedet JL, Miller DM, Nickerson KG. Results of conservative management of cervical intraepithelial neoplasia. *Obstet Gynecol* 1992; **79**: 105-109.
35. Flannely G, Langhan H, Jandial L, *et al.* A study of treatment failures following large loop excision of the transformation zone for the treatment of cervical intraepithelial neoplasia. *Br J Obstet Gynaecol* 1997; **104**: 718-722.
36. Ferenczy A, Choukroun D, Arseneau J. Loop electrosurgical excision procedure for squamous intraepithelial lesions of the cervix: advantages and potential pitfalls. *Obstet Gynecol* 1996; **87**: 332-337.
37. Spitzer M, Chernys AE, Seltzer VL. The use of large-loop excision of the transformation zone in an inner-city population. *Obstet Gynecol* 1993; **82**: 731-735.
38. Lerman C, Hanjani P, Caputo C, *et al.* Telephone counseling improves adherence to colposcopy among lower-income minority women. *J of Clin Oncology* 1992; **10**: 330-333.
39. Marcus AC, Crane LA, Kaplan CP, *et al.* Improving adherence to screening follow-up among women with abnormal pap smears. *Med Care* 1992; **30**: 216-229.
40. Kavanagh AM, Broom DH. Women's understanding of abnormal smear test results: a qualitative interview study. *BMJ* 1997; **314**: 1388-1391.
41. Roberts RA, Blunt S. The psychological reaction of women to a colposcopy clinic. *Br J Obstet Gynaecol* 1994; **101**: 751-752.
42. Mould TAJ, Rodgers ME, Singer A. The psychological reaction of women to a colposcopy clinic. *Br J Obstet Gynaecol* 1995; **102**: 428-429.
43. Quillam S. *Positive smear*. London: Penguin Books, 1989.
44. Roberts RA. *The emotional impact of women receiving an abnormal smear*. Presentation to the annual meeting of the British Society of Colposcopy and Cervical Pathology, Birmingham, 1988.
45. Rickert VI, Kozlowski KJ, Warren AM, *et al.* Adolescents and colposcopy: The use of different procedures to reduce anxiety. *Am J Obstet Gynecol* 1994; **170**: 504-509.
46. Gath DH, Hallam N, Walis LM, *et al.* Emotional reactions in women attending a UK colposcopy clinic. *J Epidemiol* 1995; **49**: 79-83.
47. Emens JM. The psychological reaction of women to a colposcopy clinic. *Br J Obstet Gynaecol* 1994; **101**: 751-752.
48. Marteau TM, Walker P, Giles J, Smail M. Anxieties in women undergoing colposcopy. *Br J Obstet Gynaecol* 1990; **97**: 859-861.
49. Reelick NF, de Haes WFM, Schuurman JH. Psychological side-effects of the mass screening on cervical cancer. *Soc Sci Med* 1984; **18**: 1089-1093.
50. Campion MJ, Brown JR, Mccance DJ, *et al.* Psychosexual trauma of an abnormal cervical smear. *Br J Obstet Gynaecol* 1988; **95**: 175-181.
51. Boag FC, Dillon AM, Catalan J, *et al.* Assessment of psychiatric morbidity in patients attending a colposcopy clinic situated in a genitourinary medicine clinic. *Genitourin Med* 1991; **67**: 481-484.
52. Kavanagh A. *Accounts of abnormal Pap smears*. Thesis. Canberra: Australian National University, 1994.
53. Frankel S, Farrow A, West R. Non-attendance or non-invitation? A case-control study of failed outpatients appointments. *BMJ* 1989; **298**: 1343-1345.
54. Ross JD, McIver A, Blakely A, *et al.* Why do patients default from follow-up at a genitourinary clinic?: a multivariate analysis. *Genitourin Med* 1995; **71**: 393-395.
55. Stewart DE, Buchegger PM, Lickrish GM, Sierra S. The effect of educational brochures on follow-up compliance in women with abnormal Papanicolaou smears. *Obstet Gynecol* 1994; **83**: 583-585.
56. Bowman J, Sanson Fisher R, Boyle C, *et al.* A randomised controlled trial of strategies to prompt attendance for a Pap smear. *J Med Screen* 1995; **2**: 211-218.
57. Paskett ED, White E, Carter WB, Chu J. Improving follow-up after an abnormal pap smear: A randomized controlled trial. *Prev Med* 1990; **19**: 630-641.
58. Paskett ED, Phillips KC, Miller ME. Improving compliance among women with abnormal Papanicolaou smears. *Obstet Gynecol* 1995; **86**: 353-359.
59. Stewart DE, Lickrish GM, Sierra S, Parkin H. The effect of educational brochures on knowledge and emotional distress in women with abnormal Papanicolaou smears. *Obstet Gynecol* 1993; **81**: 280-282.
60. Giuffrida A, Torgerson DJ. Should we pay the patient? Review of financial incentives to enhance patient compliance. *BMJ* 1997; **315**: 703-707.
61. Carey P, Dwenda KG. Follow-up of abnormal Papanicolaou smears among women of different races. *J Fam Pract* 1993; **37**: 583-587.
62. Wilkinson C, Jones JM, McBride J. Anxiety caused by abnormal result of cervical smear test: a controlled trial. *BMJ* 1990; **300**: 440.
63. Posner T, Vessey M. *Prevention of cancer - the patient's view*. London: Kings Fund, 1988.
64. Crombie IK, Orbell S, Johnston G, *et al.* Cervical screening - the optimum visit plan for contacting users and non-users in Scotland. *J Epidem Pub Hlth* 1994; **48**: 586-589.
65. Ederer F, Axtell LM, Cutler SJ. The relative survival rate: a statistical methodology. *Natl Cancer Inst Monogr* 1961; **6**: 101-121.

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