Review Article

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

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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. Attempts to reduce the morbidity and mortality related to this cancer have revolved around the development of a primary care-based cervical screening programme, and coverage of the target population has increased from 61% in 1989–90 to 85% in 1996–97. More than 4.4 million smears tests were performed in 1996–97, of which 6% showed a degree of abnormality resulting in 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.

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. 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. 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 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.
used for assessment were appropriate sample composition, appro-
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 the 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 inade-
quately 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 papers9,30,38,39 (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 treatment12,31,32,34-37 on selected
groups of patients or interventions aimed to improve attendance
at colposcopy9,30,38,39 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 atten-
dance 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 appointments29,30 (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.12,26
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,38 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.12,25,33

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 col-
poscopy,25 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 miscar-
riage.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.14,18,21,25,40,42
‘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 col-
poscopy.45 However, although there is evidence of the anxiety
caused by colposcopy46-51 and of the effectiveness of interven-
tions to reduce anxiety,45 we identified no research evidence to
confirm that decreasing anxiety levels lead to increased compli-
ance 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 rele-
vant to follow-up, particularly for a disadvantaged population.19
This finding was supported by Marcus et al in a randomized con-
trolled 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 tele-
phone or letter to confirm their appointment subsequently
default, which may provide support for deliberately overbooking
colposcopy clinics to increase the efficiency of the service.29

Discussion
This review has raised a number of important issues. Existing
Table 1. Default rates from colposcopy.

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Attendance rate definition</th>
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<th>Comments</th>
</tr>
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<tbody>
<tr>
<td>Patterson et al 1995</td>
<td>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.</td>
<td>Proportion of eligible women who attended. Analysis by life table method to allow for changes in the denominator.</td>
<td>Assessment*: 90% First review: 81% Second review: 80%</td>
<td>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.</td>
</tr>
<tr>
<td>Mitchell et al 1992</td>
<td>Melbourne, Australia; 1988; systematic sample of women booked to attend the dysplasia clinic (mixture of new referrals and repeat appointments); n = 251.</td>
<td>Proportion of women who failed to ever attend within 18 months of appointment</td>
<td>Assessment: 99.6% Treatment: 98.8% Review: 81.0%</td>
<td>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.</td>
</tr>
<tr>
<td>Miller et al 1995</td>
<td>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.</td>
<td>Proportion of eligible women who attended within six months of original appointment</td>
<td>Assessment*: 52.7% First review: 47.8%</td>
<td>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.</td>
</tr>
<tr>
<td>Kavanagh and Simpson 1996</td>
<td>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.</td>
<td>Proportion of eligible women who attended. Default rate per 100 women-months of follow-up = 2.2 women/100 women-months.</td>
<td>Treatment: 98.4% First review: 81.4% Scheduled*: 79.3%</td>
<td>Retrospective cohort study.</td>
</tr>
<tr>
<td>Jones et al 1992</td>
<td>London, England; 1986-87; Mild dyskaryosis. No information on reminder policy. Women under cytological surveillance; n = 203. Referrals to colposcopy; n = 205.</td>
<td>Proportion of women who ever attended.</td>
<td>Ever attended: 70.9% Ever attended: 66.8%</td>
<td>Retrospective study comparing loss to follow-up different management strategies; cytological surveillance and immediate colposcopy.</td>
</tr>
<tr>
<td>Woolley and Hicks 1997</td>
<td>Sheffield, UK; 1988-90; all appointments booked at a colposcopy clinic; n = 973 No information on reminder policy</td>
<td>Proportion of women who attended the booked appointment</td>
<td>Attended: 76.6%</td>
<td>Audit of genitourinary based colposcopy service.</td>
</tr>
<tr>
<td>Flannelly et al 1994</td>
<td>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.</td>
<td>Proportion of women who attended</td>
<td>First review: 88.5% Second review: 80.3% Two-year review: 63.2%</td>
<td>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.</td>
</tr>
</tbody>
</table>

*aAssessment and treatment visit; *as recommended by their gynaecologist; *large loop excision of the transformation zone.
Table 1. Default rates from colposcopy.

<table>
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<tr>
<td>Benedet et al 199527</td>
<td>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.</td>
<td>Proportion of women with complete follow-up; three months post treatment and four- to five-monthly.</td>
<td>Follow-up: 88.8%</td>
<td>Retrospective study aiming to compare cryotherapy and laser surgery in the treatment of CIN.</td>
</tr>
<tr>
<td>Woolley and Talbot, 199033</td>
<td>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.</td>
<td>Proportion of women who eventually attended.</td>
<td>Follow-up: 76.8%</td>
<td>Cohort study aiming to assess the extent of default in a GUM clinic. Unrepresentative of routine colposcopy referrals.</td>
</tr>
<tr>
<td>Flannelly et al 199735</td>
<td>Aberdeen, Scotland; 1989-91; consecutive series of women treated by LLETZ; n = 1000 Follow-up: four months post-treatment and smear and colposcopy seven months after treatment</td>
<td>Proportion of eligible women attending for repeat smear</td>
<td>First review: 97.5%</td>
<td>Retrospective study aiming to assess the extent of treatment failures and compare crytology and colposcopy as methods of follow-up.</td>
</tr>
<tr>
<td>Denny et al 199531</td>
<td>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.</td>
<td>Proportion of women who returned for their next appointment.</td>
<td>Treatment: 94.3%</td>
<td>Retrospective study aiming to compare biopsy and treatment with see and treat.</td>
</tr>
<tr>
<td>Spitzer et al 199337</td>
<td>New York, USA; 1990-92; women who attended colposcopy and received treatment by LLETZ; n = 236. CIN I-III. Follow-up: two-week postoperative check-up and four- to six-month follow-up.</td>
<td>Proportion of eligible women who attended for follow-up.</td>
<td>First review: 74.6%</td>
<td>Cohort study aiming to assess the feasibility of treatment by LLETZ.</td>
</tr>
<tr>
<td>Ferenczy et al 199636</td>
<td>Montreal, Canada; 1990-94; consecutive referrals to colposcopy clinic; n = 1189 Follow-up: three- to six-month intervals post-treatment.</td>
<td>Proportion of women who attended for follow-up.</td>
<td>First review: 90.0%</td>
<td>Cohort study aiming to compare traditional two-step procedure (biopsy then treat) with ‘see and wait’ (LLETZ).</td>
</tr>
</tbody>
</table>

*Assessment and treatment visit; †as recommended by their gynaecologist; ‡large loop excision of the transformation zone.
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 proportion of the total study population for which complete follow-up is available. 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.

**Table 2. Interventions.**

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Attendance rate definition</th>
<th>Attendance rate</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lauver and Rubin, 1990[^1,2]</td>
<td>Pennsylvania, USA; n = 116. Low income women; 94% black. Smears indicated either CIN or HPV. Colposcopy was in a secondary care setting. Cohort design.</td>
<td>Message framing and dispositional optimism on follow-up.</td>
<td>Attendance within six weeks of contract.</td>
<td>N/S effect on attendance.</td>
</tr>
<tr>
<td>Marcus et al 1992[^3,4]</td>
<td>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; 2x2 factorial design.</td>
<td>Educational pamphlet and personalized letter or slide tape programme or transportation incentive.</td>
<td>Return clinic visit for follow-up care.</td>
<td>Transport incentive best as single intervention P&lt;0.05 combined letter and tape had positive effect on follow-up P&lt;0.01.</td>
</tr>
<tr>
<td>Miller et al 1997[^5,6]</td>
<td>Philadelphia, USA; 1992-95; n = 828. Low income women, 86% black. Smears ranged from atypia to invasive carcinoma. Smears suggestive of carcinoma were excluded. Colposcopy in secondary care. RCT.</td>
<td>Telephone counselling with or without a booster call or telephone confirmation call or standard care.</td>
<td>Adherence within six months of original appointment.</td>
<td>Counselling more effective than confirmation more effective than standard care.</td>
</tr>
<tr>
<td>Lerman et al 1992[^7,8]</td>
<td>Philadelphia, USA; n = 90. Low income women, 85% black and 92% unmarried. Smears reported as class 3-5. Colposcopy in secondary care. RCT.</td>
<td>15-minute structured telephone counselling protocol or standard care for women who had defaulted once from colposcopy follow-up.</td>
<td>Compliance with re-scheduled colposcopy appointment.</td>
<td>67% of intervention group complied with rescheduled appointment compared with 43% of the control group; P&lt;0.05.</td>
</tr>
</tbody>
</table>

**Table 3. Overall estimated default rates.**

<table>
<thead>
<tr>
<th>Visit</th>
<th>Studies</th>
<th>Number</th>
<th>Attendance rate (%)</th>
<th>Weighted attendance rate (%)[^9]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment and treatment</td>
<td>Mitchell et al 1992[^29]</td>
<td>251</td>
<td>99.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Patterson et al 1995[^27]</td>
<td>200</td>
<td>90.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mitchell et al 1992[^29]</td>
<td>250</td>
<td>98.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kavanagh and Simpson 1996[^14]</td>
<td>493</td>
<td>98.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Denny et al 1995[^31]</td>
<td>123</td>
<td>94.3</td>
<td>97.0</td>
</tr>
<tr>
<td>First review</td>
<td>Patterson et al 1995[^27]</td>
<td>180</td>
<td>81.0</td>
<td></td>
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<tr>
<td></td>
<td>Kavanagh and Simpson 1996[^14]</td>
<td>485</td>
<td>81.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flannely et al 1997[^35]</td>
<td>1000</td>
<td>97.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Denny et al 1995[^31]</td>
<td>61</td>
<td>86.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spitzer et al 1993[^37]</td>
<td>226</td>
<td>74.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ferenczy et al 1996[^36]</td>
<td>1189</td>
<td>90.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mitchell et al 1992[^29]</td>
<td>247</td>
<td>81.0</td>
<td>88.7</td>
</tr>
<tr>
<td>Second review</td>
<td>Patterson et al 1995[^27]</td>
<td>146</td>
<td>80.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flannely et al 1994[^32]</td>
<td>170</td>
<td>80.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flannely et al 1997[^35]</td>
<td>975</td>
<td>92.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spitzer et al 1993[^37]</td>
<td>176</td>
<td>74.4</td>
<td></td>
</tr>
</tbody>
</table>

[^9]: Overall attendance rate calculated by combining all available data for this visit; ^treatment after assessment.
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 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. 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 defaults 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.

Default rates increase with increasing periods of follow-up, and 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.

Although a number of studies have examined methods of increasing women’s compliance with repeat smear tests, 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 in suggesting a need to tailor the intervention to the population, and the need to tailor information to the individual patient. 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 assessment, treatment, and review is important, 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 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 more realistic, cost-effective, and attainable mechanisms for increasing compliance.

References
The use of large-loop excision procedure for squamous intraepithelial lesions of the cervix: advances and potential pitfalls.


