



# Smoke free hospital campus: Strong positive shift in attitudes post implementation but paradox in nursing and medical attitudes

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## Abstract

**Background** This paper is a report of a study of acceptance by patients and staff of a hospital campus-wide smoking ban one year post-introduction, in order to determine if there was a shift in attitude, and staff perception of their individual roles in implementation. The survey also investigates the smoking rates of patients and staff.

**Method** Survey of both patients and staff in a tertiary referral university hospital in Ireland. Interviewer-delivered questionnaire survey of all inpatients on single day and sample of staff (10% in each occupational group); comparison with 2006 pre-implementation survey.

**Results** There was a significant fall in smoking rates between 2006 and 2010 in staff (17.8% v 10.7%;  $p=0.02$ ) but not in patients (22.7% v 18%;  $p>0.05$ ). Positive attitude of patients (58.6% v 84.2%,  $p<0.001$ ) and staff (52.4% v 83.3%,  $p<0.001$ ) to the campus-wide ban increased significantly between 2006 and 2010; the greatest increase was seen in doctors. When perception of own role in implementation was examined, younger staff were less likely to agree they had a role, while ex-smokers were more likely. Among the occupational groups, nurses were significantly more likely to agree than all other groups, including medical doctors.

**Conclusion** Documented significant positive change in attitudes to a campus-wide smoking ban; opposite attitudes of doctors and nurses to ban and to role in implementation. Despite documented challenges internationally, for long-term success a commitment from all staff to implementation is critically important.

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## Introduction

In March 2004 the Republic of Ireland became the first country in the world to legislate for an outright ban on indoors smoking in workplaces (1-4) and many countries have since followed suit. Yet at the time of the workplace ban in Ireland, no health-care facility opted to go with a site-wide ban including outdoors. St Vincent's University Hospital is a tertiary referral teaching hospital with a full range of acute and elective medical and surgical services in addition to a major psychiatric service. In 2009, following extensive and well-documented consultation (5) and prior assessment of acceptance, the hospital introduced a campus-wide smoke free policy. The goal was to achieve a health-care facility that is both health promoting in its ethos and as supportive and compassionate as possible to the clinical needs of smokers.

Patients were made aware of the policy by several means, including the patient information handbook given to all patients on admission, a patient information leaflet sent out prior to elective admissions and clinic appointments, a message on all letters sent to patients, posters, signage, website and voice over announcements at entrances to the hospital. A smoking cessation service was available for patients, with support for those patients wishing to quit smoking and management of smoking through nicotine replacement therapy for continuing smokers while in hospital. An exemption clause was introduced to cover the circumstances where ethically some patients could need to be given a choice to smoke, including detention under the Mental Health Act, being acutely psychotic or traumatised or terminal illness (6).

Staff were made aware of the policy through briefing sessions and policy



## Research and Best Practice

documents. Staff training using clinical vignettes was offered in small groups to all staff. A smoking cessation service and free nicotine replacement therapy for staff were all in place prior to the introduction of the policy (7).

St Vincent's University Hospital has had a Department of Preventive Medicine and Health Promotion for over 30 years and has a comprehensive smoking cessation service. Since 1997 regular surveillance of smoking prevalence was introduced, with surveillance data collected in 1997, 1998 and 2004, using similar methodology throughout. The final survey in 2004 took place before introduction of the indoor national workplace smoking ban in the Republic of Ireland later that year (5). Prior to the introduction of the campus wide ban the most recent survey was conducted in 2006, when there was strong support for the 2004 workplace ban, backed by 87.6% of staff and 81.3% of patients (5). At that time a majority, 58.6%, of patients said they would support an outright campus wide ban; support was strongest in the oldest group, with no difference in support according to General Medical Card eligibility. This is a commonly used indicator of social class in Ireland, with those on the lowest incomes eligible for a means-tested General Medical Card (GMS) entitling the holder to free GP and hospital care and prescription medications. A narrower majority of staff, 52.4%, said they would support the introduction of a total campus-wide smoking ban. This pattern was related to both age (greatest support in younger staff) and occupational groups (higher in medical, nursing, allied health professionals and administration/management than in cleaning contractors and allied services). Of those who did not support it, some were themselves non-smokers and factors such as compassion for patients and civil liberties of staff figured in their responses. A larger majority 74.7% would have been prepared to support the implementation of a campus-wide ban if were introduced, with a similar pattern in relation to age and occupational grouping.

We undertook a survey of both patients and staff in St Vincent's University Hospital in 2010, to determine the level of agreement with the ban one year post-introduction, in order to determine if there was a shift in attitude, and the perception of staff of their individual roles in implementation. The survey also investigates the smoking rates among patients and staff.

### Methods

#### Patient survey 2010

St Vincent's University Hospital is a tertiary referral

university hospital with 478 in-patient beds at the time of survey. In-patients were interviewed in a census performed across a single day. All in-patients in the relevant specialties on the days of the study were eligible for inclusion, other than those in day-care beds and those too ill to participate, as determined by the nurse in charge on each ward. A single-page questionnaire was developed and piloted. A member of hospital staff gave each patient an information leaflet, explaining the survey, the day prior to the survey being carried out. Patients had the right to refuse or give consent. Written consent was sought prior to interview. If a bed was vacant the interviewer returned, with a maximum of two attempts to see each patient.

Face-to-face interviews were conducted by the staff of the Department of Preventive Medicine and Health Promotion in the hospital, with the assistance of health promotion students and researchers.

The questionnaire sought information on smoking status, awareness of policy, acceptance of the campus wide smoking ban, beliefs about effect of passive smoking, if a patient was living with a smoker and whether there was a smoke free area in house.

Carbon monoxide (CO) testing was used to verify smoking status, by means of a breath test conducted at the time of interview.

#### Staff survey 2010

300 staff were surveyed face to face or by telephone interview. A quota sample of staff randomly selected, with 10% of staff in each occupational group selected (medical, nursing, allied health care, administration, cleaning, allied services). Due to small numbers, non-consultant hospital doctors were merged with consultants to form the medical group.

For the purposes of analysis allied services staff were merged with cleaning staff.

Data was inputted by health promotion staff. Patients were informed their data was anonymous for research purposes. Staff were verbally informed that the questionnaire was anonymous. No names were recorded. Data was entered on a password protected research database, which could only be accessed by health promotion staff.

#### Data analysis

Smoking rates were compared with 2006 data, by gender and by age group for both patients and staff. In 2006 the same methodology was used for patients as in 2010, with



## Research and Best Practice

sample size of 365 patients. However for staff a quota sample of 40 in each occupational group was taken in 2006, whereas a 10% sample of all occupational groups was taken in 2010. We present both the unweighted and weighted overall prevalence rates for smoking and attitudes for staff from 2006. The weighted prevalence was calculated by applying the percentage smokers found in each occupational group sample to the actual numbers of staff in that occupational group; the resulting numbers were summed and divided by the total staff count to give a weighted prevalence. Chi square test was used for comparison of proportions and students t test for comparison of means. Logistic regression was used to determine independent factors associated with agreement with the campus smoke free policy in both patients and staff and with staff perception of their role in implementation of policy. SAS version 9 (SAS Institute Inc, Cary, NC, USA) was used for statistical analysis.

### Ethical considerations

Ethical approval was obtained from the St Vincent's Healthcare Group Ethics Committee for patient and staff studies.

### Power considerations

The achieved sample size in patients has power of 80% to detect 10.3% increase in agreement; the sample size in staff has power of 80% to detect 12.2% increase in agreement.

## Results

### Patient survey

Of 478 beds available in the hospital, 51 were unoccupied; Interviews were conducted on 183 patients (42.7% of occupied beds). 156 patients (36.5% of occupied beds) were deemed too ill to partake in the study. Fifty-seven patients (13.3%) refused to partake, two could not speak English and 29 (6.8%) were not found after two attempts. These 88 patients were similar to the 183 patients who were included in terms of GMS status (68.2% vs 65.9%) and gender (males 56% vs 49.1%).

There was a small but non-significant overall fall in smoking rates between 2006 and 2010, with the downwards trend observed in most age groups and in both males and females (Table 1).

The carbon monoxide test verified the smokers as follows: 11 of 16 current smokers who reported smoking while in hospital were positive at cut off of 10 parts per million (69%) while 127 of 132 who reported not smoking while in hospital were negative (96%).

There was a significant positive shift in attitudes of patients to a campus-wide ban between 2006 and 2010. This was seen in both males and females, in non- and ex-smokers and in older patients particularly (Table 2).

Looking at factors associated with agreement with the campus wide smoking ban in the current study, on univariate analysis, current smokers were less likely to agree, while those who considered passive smoking to be bad for health and those aged 60 or over were more likely (Table 3). After adjustment, being aged 60 or over and current smoking remained significant. The oldest group of patients had odds seven times greater than the youngest.

We examined the same factors in relation to awareness of the ban but found no significant associations, with high levels of awareness in all groups (current smoker 90.9%, ex-smoker 78.7%, non-smoker 73.8%).

### Staff survey

The smoking rate overall among staff was 10.7% which represents a significant fall from 2006 when it was 17.8% (weighted; 18.0%). There was a trend downwards in all subcategories, but the only significant were among females and those aged 30-39 (Table 1).

There was a large significant increase in positive support among staff since the pre-implementation study in 2006; 52.4% (weighted; 51.2%), reaching 83.3% in 2010. Of the 234 staff who said they had agreed with the plan to introduce the campus ban prior to implementation 229 (97%) said they now still supported the ban; 21 (31.8%) of the 66 who said they were previously opposed now supported the ban. The greatest shift in support between 2006 and 2010 was seen in males and in medical staff (Table 2).

On univariate analysis, current smokers were less likely to accept the campus-wide smoking ban, while male staff were more likely (Table 4); significance persisted after adjustment. Medical staff (97.5%) were non-significantly more likely to support ban than nursing colleagues (82.5%).

When perception of own role in implementation was examined, younger staff were significantly less likely to agree they had a role, while ex smokers were significantly more likely to agree. Among the occupational groups, nurses were significantly more likely to agree than all other groups, including medical doctors (nurses 80.8%, doctors 32.5%; OR 13.01, 95%CI 4.1-41.9).

We asked about awareness of document detailing pro-



## Research and Best Practice

**Table 1** Smoking rates 2006 and 2010; 295 and 183 patients and 225 and 300 staff of St Vincent's University Hospital, Dublin, by gender and age group

|                    | Patients: Current Smokers |      |        |      |      | Staff: Current Smokers |      |        |      |      |
|--------------------|---------------------------|------|--------|------|------|------------------------|------|--------|------|------|
|                    | 2006                      |      | 2010   |      | p    | 2006                   |      | 2010   |      | p    |
|                    | n/N                       | %    | n/N    | %    |      | n/N                    | %    | n/N    | %    |      |
| <b>Male</b>        | 30/141                    | 21.3 | 17/90  | 18.9 | 0.66 | 13/72                  | 18.1 | 11/80  | 13.8 | 0.47 |
| <b>Female</b>      | 37/154                    | 24.0 | 16/93  | 17.2 | 0.21 | 27/153                 | 17.6 | 21/220 | 9.5  | 0.02 |
| <b>Age (years)</b> |                           |      |        |      |      |                        |      |        |      |      |
| <30                | 10/30                     | 33.3 | 6/18   | 33.3 | 1.00 | 12/72                  | 16.7 | 8/82   | 9.8  | 0.20 |
| 30-39              | 7/22                      | 31.8 | 3/7    | 42.9 | 0.59 | 14/68                  | 20.6 | 8/94   | 8.5  | 0.03 |
| 40-49              | 10/29                     | 34.5 | 7/20   | 35.0 | 0.97 | 3/43                   | 7.0  | 7/66   | 10.6 | 0.52 |
| 50-59              | 12/34                     | 35.3 | 6/20   | 30.0 | 0.69 | 9/32                   | 28.1 | 8/49   | 16.3 | 0.20 |
| ≥60                | 28/180                    | 15.6 | 11/118 | 9.3  | 0.07 | 2/10                   | 20.0 | 1/9    | 11.1 | 0.60 |
| <b>Total</b>       | 67/295                    | 22.7 | 33/183 | 18.0 | 0.22 | 40/225                 | 17.8 | 32/300 | 10.7 | 0.02 |

**Table 2** Attitudes towards total campus smoking ban 2006 and 2010; in 295 and 183 patients and 225 and 300 staff of St Vincent's University Hospital, Dublin, by gender, age group and smoking status

|                       | Patients: agree with the smoking ban |      |         |      |       | Staff: agree with the smoking ban |      |         |      |       |
|-----------------------|--------------------------------------|------|---------|------|-------|-----------------------------------|------|---------|------|-------|
|                       | 2006                                 |      | 2010    |      | p     | 2006                              |      | 2010    |      | p     |
|                       | n/N                                  | %    | n/N     | %    |       | n/N                               | %    | n/N     | %    |       |
| <b>Male</b>           | 89/141                               | 63.1 | 75/90   | 83.3 | 0.001 | 37/72                             | 51.4 | 72/80   | 90.0 | 0.000 |
| <b>Female</b>         | 84/154                               | 54.5 | 79/93   | 84.9 | 0.000 | 81/153                            | 52.9 | 178/220 | 80.9 | 0.000 |
| <b>Age (years)</b>    |                                      |      |         |      |       |                                   |      |         |      |       |
| <30                   | 14/30                                | 46.7 | 13/18   | 72.2 | 0.08  | 41/72                             | 56.9 | 69/82   | 84.1 | 0.000 |
| 30-39                 | 9/22                                 | 40.9 | 5/7     | 71.4 | 0.16  | 33/68                             | 48.5 | 80/94   | 85.1 | 0.000 |
| 40-49                 | 14/29                                | 48.3 | 12/20   | 60.0 | 0.42  | 25/43                             | 58.1 | 54/66   | 81.8 | 0.007 |
| 50-59                 | 20/34                                | 58.8 | 17/20   | 85.0 | 0.04  | 16/32                             | 50.0 | 40/49   | 81.6 | 0.003 |
| ≥60                   | 116/180                              | 64.4 | 107/118 | 90.7 | 0.000 | 3/10                              | 30.0 | 7/9     | 77.8 | 0.04  |
| <b>Smoking status</b> |                                      |      |         |      |       |                                   |      |         |      |       |
| Non                   | 75/116                               | 64.7 | 58/61   | 95.1 | 0.000 | 84/129                            | 65.1 | 177/201 | 88.1 | 0.000 |
| Ex                    | 73/112                               | 65.2 | 80/89   | 89.9 | 0.000 | 27/56                             | 48.2 | 58/67   | 86.6 | 0.000 |
| Current               | 25/67                                | 37.3 | 16/33   | 48.5 | 0.286 | 7/40                              | 17.5 | 15/32   | 46.9 | 0.007 |
| <b>Total</b>          | 173/295                              | 58.6 | 154/183 | 84.2 | 0.000 | 118/225                           | 52.4 | 250/300 | 83.3 | 0.000 |

cedures, held on all wards; there was no difference in awareness by occupational group, age or smoking status.

## Discussion

### Study limitations

The samples of patients and staff from 2006 and 2010 were independent. Each study represents a cross-sectional study at a point in time. Over one third of inpatients were ineligible, with illness preventing participation, as determined by the nurse in charge on the ward.

We did not validate staff smoking, as the main focus of this study was to determine changing attitudes following introduction of campus wide smoking ban. However staff reporting of smoking is unlikely to be biased, in that there was no sanction associated with responses given, the study was entirely confidential with no link to the human resources department, which should improve truthfulness of response. In our previous study (5), we confirmed smoking rates vary by occupational group, reflecting the national picture of variation with socioeconomic class.



## Research and Best Practice

**Table 3.** Agreement with smoke-free campus policy – 183 patients of St Vincent’s University Hospital, Dublin 2010

| Variable  | Agree n/N (%)  | Univariate OR (95% CI) | Multivariate OR (95% CI) ∞ |
|---|----------------|------------------------|----------------------------|
| <b>Age (Years)</b>                                    |                |                        |                            |
| <30   | 13/18 (72.2)   | 1.0                    | 1.0                        |
| 30-39   | 5/7 (63.0)     | 1.92 (0.18-2.82)       | 3.22 (0.19-54.92)          |
| 40-49   | 12/20 (60.0)   | 0.66 (0.16-2.65)       | 0.88 (0.14-5.69)           |
| 50-59   | 17/20 (85.0)   | 3.27 (0.55-19.62)      | 7.99 (0.93-68.70)          |
| ≥60   | 106/117(90.6)  | 3.71 (1.11-12.35)*     | 7.21 (1.13-46.18)*         |
| Female  | 79/93 (84.9)   | 1.4 (0.62-3.33)        | 1.11 (0.37-5.87)           |
| Male  | 75/90 (83.3)   | 1.0                    | 1.0                        |
| <b>Smoke free area at home</b>                        |                |                        |                            |
| Yes   | 139/160 (86.9) | 2.55 (0.82-7.87)       | 1.47 (0.19-6.21)           |
| No  | 13/20 (65.0)   | 1.0                    | 1.0                        |
| <b>Living with a smoker</b>                           |                |                        |                            |
| Yes   | 39/49 (79.6)   | 0.64 (0.26-1.55)       | 0.91 (0.27-3.05)           |
| No  | 115/134 (85.8) | 1.0                    | 1.0                        |
| <b>Agree that passive smoking is bad for health</b>   |                |                        |                            |
| Yes   | 141/161 (87.6) | 5.94 (1.47-24.06)**    | 5.48 (0.92-32.57)          |
| No  | 5/9 (55.6)     | 1.0                    | 1.0                        |
| Non smoker  | 3/61 (95.1)    | 1.0                    | 1.0                        |
| Ex smoker   | 80/89 (89.9)   | 0.52 (0.13-2.03)       | 0.23 (0.04-1.45)           |
| Current smoker  | 16/33 (48.5)   | 0.06 (0.01-0.21)**     | 0.03 (0.01-0.20)**         |
| <b>GMS card †</b>                                     |                |                        |                            |
| Yes   | 103/120 (85.8) | 1.54 (0.50-4.68)       | 1.10 (0.19-6.21)           |
| No  | 50/62 (80.7)   | 1.0                    | 1.0                        |
| <b>Among smokers only - Smoking while in hospital</b> |                |                        |                            |
| Yes   | 7/17 (41.2)    | 0.68 (0.17-2.80)       | Not included in model      |
| No  | 9/16 (56.3)    | 1.0                    |                            |

\* p<0.05, \*\* p<0.01, ∞ Multivariate model, including all variables listed (except smoking while in hospital),

† General Medical Services card, means-tested, entitling the holder to free GP and hospital care and prescription medications

### Discussion of results

International reports of hospital smoking bans are mixed, but this is among the few articles reporting introduction in a major tertiary referral teaching hospital. This is the first report of a campus wide smoking ban in a hospital in the Republic of Ireland, the country which was the first worldwide to implement a workplace smoking ban indoors. The introduction of the campus-wide ban followed a national shift in attitudes to smoking, prompted by the workplace smoking ban.

The International Health Promoting Hospitals and Health services was initiated in 1993 by the World Health Organisation (8). The Irish Health Promoting Hospital (HPH) network was launched in 1997 and is the coordinating body for Health Promoting Hospitals

in Ireland. The network produces evidence to help hospitals and health services achieve their mission in relation to Health Promotion. It supports cooperation and exchange of experience between participating hospitals. St Vincent’s University Hospital has been a member of the Network from the start and the hospital has been actively involved at national and international level. Membership of HPH facilitates development of a corporate identity that embraces the aims of health promotion.

The ENSH (European Network for Smoke-Free Healthcare Services) Global Network for Tobacco Free Health Care Services is an independent, international association whose mission “is to promote and support smoke-free health care centres all over the world” (9). The ENSH Network has developed a 10-point code and standards,





## Research and Best Practice

**Table 4** Agreement with smoke-free campus policy – 300 staff of St Vincent's University Hospital, Dublin 2010

| Variable                   | Agree n/N (%)  | Univariate OR (95% CI) | Multivariate OR (95% CI) ∞ |
|----------------------------|----------------|------------------------|----------------------------|
| <b>Age (Years)</b>         |                |                        |                            |
| <30                        | 69/82 (84.1)   | 1.0                    | 1.0                        |
| 30-39                      | 80/94 (85.1)   | 1.08 (0.47-2.48)       | 1.02 (0.42-2.48)           |
| 40-49                      | 54/66 (81.8)   | 0.85 (0.36-2.01)       | 0.86 (0.33-2.23)           |
| 50-59                      | 40/49 (81.6)   | 0.84 (0.33-2.13)       | 0.91 (0.32-2.63)           |
| ≥60                        | 7/9 (77.8)     | 0.66 (0.12-3.53)       | 0.76 (0.11-5.48)           |
| Male                       | 72/80 (90.0)   | 2.12 (0.95-4.75)       | 3.28 (1.22-8.78)           |
| Female                     | 178/220 (80.9) | 1.0                    | 1.0                        |
| Non smoker                 | 177/201 (88.1) | 1.0                    | 1.0                        |
| Ex smoker                  | 58/67 (86.6)   | 1.38 (0.63-2.99)       | 0.75 (0.32-1.78)           |
| Current smoker             | 15/32 (46.8)   | 0.12 (0.06-0.27)**     | 0.12 (0.06-0.27)**         |
| <b>Occupation</b>          |                |                        |                            |
| Administration             | 34/40 (85.0)   | 1.0                    | 1.0                        |
| Allied health care         | 34/40 (85.0)   | 1.0 (0.29-3.41)        | 0.86 (0.24-3.12)           |
| Allied services & cleaning | 44/60 (73.3)   | 0.48 (0.17-1.37)       | 0.41 (0.13-1.31)           |
| Medical                    | 39/40 (97.5)   | 6.88 (0.79-60.06)      | 3.35 (0.36-30.85)          |
| Nursing                    | 99/120 (82.5)  | 0.83 (0.31-2.23)       | 0.90 (0.31-2.64)           |

\* p<0.05, \*\* p<0.01, ∞ Multivariate model, including all variables listed

which provide all healthcare organisations, wanting to achieve a tobacco free campus, with a framework of best practice and standards to implement; the ENSH Code and Standards were used to guide the implementation of the smoke free campus policy in St Vincent's University Hospital.

All specialist cancer hospitals in the country will follow suit over the coming months, comprising seven more of the largest hospitals in the state. We report a significant increase in approval of the ban one year post implementation in almost all groups except current smokers. St Vincent's University Hospital encompasses a sizeable acute and long stay inpatient psychiatric department; studies in the UK show that psychiatric staff express significantly less favourable attitudes than general staff to smoke free health care settings (10). Yet we found high acceptance rates in all occupational groups, representing staff from across the entire hospital.

In the United States the focus of evaluation of campus smoking bans is mainly on retention of patient numbers in private hospitals. Reported pre-implementation acceptance of hospital campus bans is higher (up to 83%) (11) than found in our study. A Cochrane systematic review of legislative bans on smoking highlights the important potential health gain for acute hospital admission rates of smoking-related details so the banning of smoking outright in such settings sends a consistent

public health message (12).

Current smoking was the only significant factor associated with a negative perception of the ban among patients; however the important finding is the decreasing percentage of patients who smoke, meaning that dissenters represent a small minority. There was a similar finding among staff with a small dissenting proportion of a small number of smokers.

We found a paradox in that almost all doctors were in agreement with the introduction of the campus ban, but very few saw any role for themselves in implementation; this was in direct contrast to their nursing colleagues, who although they had a lower agreement rate perceived a major role in implementation. Implementation and enforcement represents the major challenge reported in the National Health Service (NHS), where risk of abuse is a deterrent to staff to engage in active policy enforcement (13). Most medical and nursing staff in the NHS report that they do not enforce smoke-free regulations (14); however a progressive trend is also reported towards medical staff being more likely to challenge patients, visitors and staff smoking when compared to nursing staff (14). This suggests the barriers to successful implementation are more attitudinal than infrastructural. Clinical hospital staff must conceptualise this as a clinical issue in which they have a responsible role for bans to be enforced effectively.



## Research and Best Practice

We had found that small numbers of medical and nursing staff attended training sessions prior to introduction of the campus ban; attendance at such sessions did not feature as significant predictors of perceived role in implementation. The small numbers that did attend training sessions using clinical vignettes anecdotally found these very supportive, but a serious commitment to training prior to implementation was lacking. Lack of clarity regarding implementation of smoking regulation is seen as a reason why staff may not play a role in enforcement of policy (14). Medical staff play a key role in implementation, through prescription of nicotine replacement therapy for management of smoking while in hospital (15;16) and through advice to patients pre elective admission or during admission which may serve as cue to action (17).

We have documented significant positive change in attitudes to a campus-wide smoking ban. For such a ban to be successful in the long term a commitment from all staff to implementation is both important and necessary to document.

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