Evidence Briefing on Smoking Cessation/Tobacco Addiction Nurse-led Services

- The National Lung Cancer Forum for Nurses (NLCFN) is developing national guidelines on smoking cessation services. This evidence briefing was commissioned to support guideline development.

- Worldwide, numerous empirical studies, both primary and secondary, have studied the effectiveness of nurse-led interventions for smoking cessation.

- There is moderate-quality evidence that nursing-led smoking cessation services may be effective in terms of quit rates, but follow up is rarely beyond one year.

- Intensity of intervention, setting, and resourcing may all influence quit rates.

- There is a paucity of UK based research – though UK findings are consistent with other countries.

This evidence briefing was compiled by ScHARR Information Resources Information specialists for NLCFN. The briefing was completed in March 2018. Further information on the methods used can be obtained from a.rees@shef.ac.uk.
Background
Nurse-led smoking cessation services are widely offered both in the UK and worldwide. In the UK the NHS Stop Smoking service is available both in primary and secondary care and is delivered largely by nursing and ancillary staff. This briefing has been commissioned to inform guideline production by NLCFN – the evidence reviewed here is not comprehensive and the methods are not those of a full systematic review. However the highest quality and most relevant empirical research has been reviewed to produce an overview of the literature. The scope of the work is as follows:

- Population: Smokers
- Intervention: Nurse-led smoking cessation/tobacco addiction services in the UK and worldwide
- Comparator: any alternative smoking cessation service.
- Outcomes: quit-rates and any other measures of effectiveness and cost-effectiveness.

Methods
Searches undertaken for this briefing were not exhaustive but all major databases were searched with important/relevant keywords as specified by NLCFN and the information specialist. The aim was to identify systematic reviews, quality assessed evidence and randomised controlled trials.

The following databases were searched between July and December 2017:

- Medline (via OVID)
- Embase (via OVID)
- Psychinfo (via OVID)
- CINAHL (via Ebsco)
- ASSIA (via ProQuest)
- The Cochrane Database of Systematic Reviews
- Database of Abstracts of Reviews of Effects
- Cochrane Central Register of Controlled Trials

While searches were largely confined to a 10 year period (2007-2017), some earlier studies were included – largely due to the small number of recent studies in the UK and the relevance of earlier studies to the briefing.

The search strategy was developed in Medline and adapted for other databases. It comprised Medical Subject Headings (MeSH) where appropriate with freetext terms. The example below is from Medline:

1 Smoking Cessation/
2 quit* smok*.mp.
3 smoking cessation.mp
4 (cease adj 2 smok*).mp
5 give up smoking.mp
6(smoking adj2 (clinic or service)).tw.
7 (tobacco adj2 (clinic or service)).tw.
8 or/1-7
9 Nurse's Role/
10 (nurse or nursing).ti,ab.
11 Primary Health Care/
12 Nurse Practitioners/
13 Nursing Staff/ or Nurses' Aides/
14 health care assistant*.ti,ab.
15 or/9-14

16 (review* or meta-analy* or metaanaly* or metanaly* or trial* or evaluation or random* or therap*).ti,ab,sh,pt.
17 8 and 15 and 16

The strategy produced are large set of potential studies (see table 1).

The following websites were also searched for potential UK studies:

- Kings Fund
- Royal College of Nursing

References were imported into Endnote software and scanned by title, then abstract before finally obtaining full text of the remaining papers. The full text was read and further papers excluded. Papers were excluded if they took place in a setting outside the UK, were not empirical research or where the specifics of the service delivery were unclear. This resulted in a final set of 8 relevant studies and reviews.

Table 1: Flow of papers through the search process.

The final set of papers were then re-read and their findings summarised. Key data was extracted from each paper and is presented in table 2.

Characteristics of Included Studies

The eight studies included in this briefing comprised six Randomised Controlled Trials (RCTs) (Hajek 2002, Aveyard 2003, Aveyard 2007, Hall 2007, Wood 2008, Gilbody 2015) one observational study/cost-effectiveness analysis (Bauld 2011) and one Systematic Review (SR) (Hill Rice 2017). The total study population across the six trials was 9,680. The total pooled population
for the systematic review was over 20,000 participants. Interventions included brief and intensive programmes, interviews, group sessions, booklets and other printed advice, telephone calls and pharmacological interventions such as nicotine patches. Two studies, (Hajek 2002, Wood 2008) contained participants who had a pre-existing condition where smoking may have been a causative factor. Both these studies recruited patients in hospital. Four studies took place in primary care (Aveyard 2003, Aveyard 2007, Hall 2007, Bauld 2011). One study recruited patients in both primary and secondary care settings (Wood 2008). One study had only female participants (Hall 2007). Among the RCTs, final follow-up varied from 10 weeks (Hall 2007) to 1 year (Hajek 2002, Aveyard 2003, Aveyard 2007, Wood 2008, Gilbody 2015). For further information on study characteristics see table 2.

**Evidence for the effectiveness of nurse-led smoking cessation/tobacco addiction services**

- **Hajek 2002**

This study looked at a smoking cessation intervention for patients admitted to hospital either after Myocardial Infarction (MI) or patients attending for Coronary Artery Bypass surgery. 540 participants under the age of 76 who expressed a commitment to quitting smoking were recruited at 17 different hospitals in the UK. Patients in the control group (266) received a booklet with advice regarding quitting smoking and verbal advice on abstinence – this was defined as ‘usual care’. Patients in the intervention group (274) received an intervention lasting 20-30 minutes including carbon monoxide reading, a quiz, the offer of support/contact with other quitters and a declaration of commitment to quit smoking which the patient was asked to sign. Both interventions were delivered by nursing staff in the hospital setting.

Outcome measures were continued abstinence recorded at six weeks and 12 months. This was validated by carbon monoxide and saliva tests. Participants who died or moved away were eliminated from the study. Those whose follow up data was not available for any other reasons were assumed to be still smoking and included in the analysis.

At 6 weeks no significant difference in quit rates was noted between the groups. Adherence with interventions was poor in some cases, with fewer than 70% of patients signing the declaration to quit and fewer still actually receiving the offer of support from other quitters. The intensity of the intervention placed extra burden on nursing staff who struggled to deliver all aspects of the intervention alongside other duties.

*Bottom line:* An intensive intervention did not show any benefit compared to more basic care. Nursing staff on wards failed to deliver certain aspects of the intensive intervention in all cases due to time pressures.

- **Aveyard 2003**

This multi-arm RCT examined four different smoking cessation interventions.

The research team recruited 2471 smokers from 65 GP surgeries across the West Midlands, UK. The control group (690) received self-help literature. The ‘manual’ group (683) received the ‘Pro-Change’ intervention comprising a self-help workbook and questionnaires at 3 monthly intervals – resulting in tailored feedback. The ‘telephone’ group (685) were offered the same as the manual
group with the addition of three phone calls. The ‘nurse’ group (413) received the manual intervention plus three appointments with a nurse.

Only participants in the nurse arm received a specific nurse-led intervention – though the authors state that the face-to-face appointment offered to participants in this group was ‘usually’ with a practice nurse so it is reasonable to assume some patients in this group may have seen an alternative member of staff, possibly their GP.

The primary outcome measure was quit rates at 12 months, which was the end point of the study. A secondary outcome was a sustained abstinence of six months or more.

The telephone group performed best with 82 (12%) of patients self-reporting quitting at 12 months. There was low uptake of appointment offers within the nurse group with 20% attending at their first face-to-face appointment, 6% at the second and 2% at the third. Recruitment to the nursing arm was curtailed due to lack of resources and distribution of patients across the four arms was uneven as a result of this.

**Bottom line**: The study showed no additional benefit to adding face-to-face appointments with a nurse in terms of quit rates. However, adding additional resources to the basic care offered to the control group showed small benefits across all three intervention arms.

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Aveyard 2007

This RCT compared basic with more intensive behavioural interventions to assist smoking cessation, in combination with pharmacotherapy.

925 smokers were recruited from 26 general practices in the UK and assigned to one of two treatment arms. The control group (469) were given an initial appointment, a telephone call and two subsequent appointments. This was defined as a low intensity intervention and in line with the best practice recommendations of the NHS Stop Smoking Service. Participants in the intervention arm (456) received two additional phone calls and an additional visit. Both groups also received nicotine patches. Treatment in both arms was administered by nursing staff.

Outcome measures were abstinence at 4, 12, 26 and 52 weeks.

At four weeks 105(22.4%) in the control group had quit vs 102(22.4%) in the intervention group. At twelve weeks 66(14.1%) in the control group were still abstinent vs 52 (11.45) in the intervention group. At 26 weeks quit rates were 50 (10.7%) in the control arm and 40(8.8%) in the intervention arm. Finally at 56 weeks 36 (7.7%) of participants were still abstinent in the control group vs 30 (6.6%) in the intervention group.

There was no significant difference in quit rates between the two groups at any of the measurement points of the trial. Quit rates overall in both groups were as would be expected from nicotine patches alone. At six months, using the confidence interval as bounds a 2% benefit with low intensity support could be observed, though was not achieved in this study.
Bottom line: Additional behavioural support of either low or high intensity did not improve quit rates. When nicotine patches are given, additional behavioural support should be targeted only at those patients identified as more likely to benefit from it.

- Hall 2007
This cluster RCT utilised the opportunity presented by routine cervical screening to offer an additional brief smoking cessation intervention. This trial did not seek to improve quit rates, rather intention to quit. It is included here as it gives an indication of how smoking beliefs in patients may be altered by a nurse-led intervention.

242 women attending for cervical screening were recruited in 8 general practices in the south east of England. Patients were then assigned to receive either no advice (control arm) or a brief verbal advice from a nurse complimented with written information (intervention arm). Follow up was at two and ten weeks.

The primary outcome of interest was intention to stop smoking as assessed by postal questionnaire at two and ten weeks.

At two weeks 172/242 women returned the postal questionnaire. Three women in the intervention group had stopped smoking and 2.86 (mean) expressed an intention to quit vs 2 and 2.9 (mean) in the control group. At 10 weeks 153 women returned the questionnaire. Twelve patients in the intervention group had quit smoking and 3.13 (mean) declared an intention to quit vs 5 and 2.24 (mean) in the control group.

Bottom line: offering a brief, single intervention at routine screening appointments offers a small improvement to both quit rates and intention to quit in the short term compared to no intervention at 10 weeks.

- Wood 2008
This was a multicentre, 4 arm RCT, part of which took place in the UK. The aim of the study was to look at the effectiveness of a multidisciplinary, multifaceted, nurse-led intervention for improving outcomes in and preventing coronary heart disease compared with usual care. The EUROACTION programme is a nurse-led intervention that incorporates numerous health-based lifestyle changes, including smoking cessation. Nicotine dependence was assessed using the Fagerstrom test and nurses ‘helped smokers to prepare to quit’ though the exact details of the intervention were not reported.

2,560 patients with coronary heart disease were recruited in 12 hospitals and 2,246 ‘high risk’ individuals were recruited in 12 primary care practices. Patients from each setting were assigned to receive either the EUROACTION programme or ‘usual care’. In total in the hospital setting 1,061 patients received the intervention and 1,499 received usual care. In the ‘high risk’ patients identified in primary care 1,118 patients received the intervention and 1,128 received usual care. Partners of the participating patients were also offered the opportunity to participate in the same treatment in both groups.
In the coronary heart disease patients – of those that had smoked in the month before the study - 136 (58%) in the intervention and 154 (47%) in the usual care groups did not smoke after one year. However this difference was not significant (P0.06) Smoking cessation at one year did not differ between intervention and control group in the ‘high risk’ patients.

**Bottom line:** Smoking reduced in both arms in each group in the trial (4 arms total) however there was no significant difference between treatment groups in either the high risk or coronary heart disease patients. Separate data on the UK patients was not available.

- **Gilbody 2015**

The SCIMITAR trial provides the most up to date trial evidence in this briefing. It is also has the smallest study population as it is a pilot study to assess the likely impact and feasibility of a larger study. It assesses the impact of a smoking cessation intervention specifically designed for severely mentally ill people. Intensive behavioural support including face-to-face appointments, collaboration and cooperation with the patient’s psychiatrist and GP and pharmacological interventions were compared with ‘usual care’ such as NHS Stop Smoking Service.

97 participants with either bi-polar disorder or schizophrenia were recruited, 51 were assigned to the control arm and 46 to the intervention group. Engagement was poor among the control arm with no participants accessing the offered standard intervention. Nurses delivered the treatment in the intervention arm while in the control arm the offered service was delivered in primary care where the exact mode of delivery (nurse or GP) was unclear.

The primary outcome was smoking cessation at 12 months as reported by the patient, this was then validated by a CO monitor test.

At 12 months 33 (72%) participants in the intervention arm were assessed for smoking cessation vs 35 (69%) in the control arm. Smoking cessation (either self-reported or CO validated) at 12 months was 12 (36%) in the intervention group and 8 (23%) in the control arm.

This was a pilot trial and the small sample size, lack of blinding and specific nature of the participants makes wider generalisability difficult.

**Bottom line:** In people with severe mental illness, a tailored, intensive intervention delivered by specially trained mental health nurses may increase quit rates compared to standard treatment. A larger trial is necessary to validate this.

- **Hill Rice (Cochrane) 2017**

This is the only systematic review included here. Originally published in 2001, it was last updated in 2017 to include 9 more recent studies, one of which was conducted in the UK and is discussed separately above (Gilbody 2015). The review includes 58 studies from all over the world, of which 11 were from the UK. Of these 11 studies, five are discussed separately in this briefing (Hajek 2002, Aveyard 2003, Aveyard 2007, Wood 2008, Gilbody 2015) The review is included here to give an understanding of how results from UK trials are consistent with findings elsewhere.

Of the 58 studies included in the review 44 were suitable to be pooled for meta-analysis. Studies included covered a wide variety of interventions ranging from ‘intensive’ - defined broadly as
interventions consisting of more than one face-to-face session alongside other aides to quitting such as written information, to ‘brief’ interventions - comprising only written or verbal instructions with no face-to-face contact or perhaps a single appointment. Overall study quality was found to be moderate.

Primary outcomes measured were quit rates at the longest point of follow up, this included a pooled estimate of low and high intensity interventions combined, plus separate estimates of the effectiveness of low and high intensity interventions.

In the main meta-analysis nurse-led interventions moderately improved the chance of patients quitting compared to ‘usual’ or no intervention (Relative Risk 1.29, 95% Confidence Interval 1.21 to 1.38). No separate analysis by country was undertaken. Some analysis stratified by setting, intensity of intervention, pre-existing health problems, location of the intervention within a wider support programme and nursing role was also undertaken.

**Bottom line**: Nurse-led interventions appear to offer modest improvements in quit rates compared to ‘usual’ or no treatment. It was unclear as to whether setting or nursing role played a part in the success of interventions. Findings were broadly consistent across countries, quality of studies was moderate.
<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>Study Design</th>
<th>Primary Care</th>
<th>Participants</th>
<th>Treatment</th>
<th>Comparison</th>
<th>Duration of follow up</th>
<th>Results</th>
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<tbody>
<tr>
<td>Hajek 2002</td>
<td>UK</td>
<td>RCT</td>
<td>Secondary Care</td>
<td>540 smokers admitted to hospital following Myocardial Infarction or for Bypass surgery</td>
<td>Verbal advice and a booklet</td>
<td>Booklet only</td>
<td>6 weeks and 12 months</td>
<td>Intensive intervention was not shown to be more effective than basic.</td>
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<td>Aveyard 2003</td>
<td>UK</td>
<td>Multi-arm RCT</td>
<td>Primary</td>
<td>2471 smokers identified in general practice</td>
<td>Self help workbook with tailored feedback, plus telephone call or appointment.</td>
<td>Basic self-help literature</td>
<td>12 months</td>
<td>Study showed no significant benefit of adding nurse appointment to self help.</td>
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<td>UK (Oxfordshire)</td>
<td>RCT</td>
<td>Primary</td>
<td>Primary</td>
<td>925 smokers in general practice</td>
<td>Intensive behavioural support - weekly visits, telephone calls and additional visits</td>
<td>Basic behavioural support - 3 appointments and 1 telephone call</td>
<td>4, 12, 26 and 52 Weeks</td>
<td>The study showed no benefit for intensive behavioural support vs basic support, individuals identified</td>
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<td>Study</td>
<td>Country</td>
<td>Study Design</td>
<td>Setting</td>
<td>Participants</td>
<td>Intervention</td>
<td>Duration</td>
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<td>Hall 2007</td>
<td>UK</td>
<td>Cluster RCT</td>
<td>Primary</td>
<td>242 women attending for cervical screening</td>
<td>Brief Smoking Cessation intervention offered at cervical screening</td>
<td>No offer</td>
<td>2 and 10 weeks</td>
<td>Study showed higher quit rates among groups that has received the intervention at 10 weeks</td>
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<tr>
<td>Wood 2008</td>
<td>UK (as part of a multicentre study)</td>
<td>RCT</td>
<td>Both, 12 hospitals and 12 general practice</td>
<td>5,405 patients with CHD in both primary and secondary care</td>
<td>EUROACTION protocol including Goal setting, relapse planning, interviews and support.</td>
<td>non-specified 'usual care'</td>
<td>16 Weeks - 1 year</td>
<td>Smoking rates reduced in all four arms of the trial but quit rates between arms/setting</td>
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<tr>
<td>Study</td>
<td>Country</td>
<td>Type</td>
<td>Setting</td>
<td>Participants</td>
<td>Interventions</td>
<td>Duration</td>
<td>Notes</td>
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<tr>
<td>Hill Rice et al 2017</td>
<td>Worldwide (including 2 UK studies)</td>
<td>Systematic Review</td>
<td>Primary and Secondary</td>
<td>&gt;20,000 participants from a total of 44 studies</td>
<td>Various nursing led interventions</td>
<td>6 months +</td>
<td>Moderate quality evidence shows modest improvement in quit rates for patients receiving nurse-led treatment.</td>
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<tr>
<td>Gilbody 2015</td>
<td>UK</td>
<td>RCT (pilot study)</td>
<td>Primary and secondary</td>
<td>97 smokers</td>
<td>Bespoke smoking cessation intervention tailored to needs of mental health patients (bipolar, schizophrenia)</td>
<td>12 Months</td>
<td>Smoking cessation was higher at 12 months among patients who received the bespoke intervention 38%/23%</td>
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<td>Bauld 2011</td>
<td>UK</td>
<td>Observational Study/Cost Effectiveness Analysis</td>
<td>Primary</td>
<td>1785 Smokers In Glasgow, Scotland.</td>
<td>12 weeks of one to one counselling plus pharmacological interventions</td>
<td>1 year</td>
<td>Smoking cessation was higher at 12 months among patients who received the</td>
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<td>group</td>
<td>intervention</td>
<td>6.3% vs 2.8</td>
<td>but costs</td>
<td>where higher to provide this service</td>
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**Cost Effectiveness**
This briefing does not seek to establish the cost effectiveness of nurse-led smoking cessation interventions. However one study did examine the cost effectiveness of a nurse-led service compared to a pharmacy led intervention. This study was not an RCT so is included here only to give an example of costs associated with nurse-led interventions.

- **Bauld 2011** assessed the cost-effectiveness of a primary care-based group intervention compared with a pharmacy-based one-to-one approach. 411 patients received the group intervention and 1374 received pharmacy care. This was an observational study utilising existing data so the groups were not balanced. At 12 months, smoking had reduced in both groups and quit rates were 6.3% for the group intervention and 2.8% for the pharmacy intervention. The incremental cost per Quality Adjusted Life Year (QALY) was £4,800 for the group intervention and £2,600 for the pharmacy intervention. Despite the difference in effect and cost, both interventions were deemed to be cost-effective based on a lifetime analysis.
This is however a single study and costs across the interventions presented in this briefing will vary considerably.

**Summary**
The studies included compare a range of different nurse-led and non nurse-led interventions. Interventions took place in a variety of settings and studies varied in size. This makes comparison or synthesis difficult.

The Cochrane review (Hill Rice 2017) found that overall, nurse-led interventions offer a modest improvement in quit rates compared to ‘usual’ or no treatment.

The studies presented here report somewhat conflicting findings. In making recommendations for practice it would seem that setting, intensity of intervention, training of staff and resources all need to be considered and may impact on both effect size and costs.

**References**


