



Measurement Of Depletion Voltage And Leakage Current For Silicon Strip Detectors

[Link to publication record in Manchester Research Explorer](#)

Citation for published version (APA):

Jones, M. A. S. (1997). *Measurement Of Depletion Voltage And Leakage Current For Silicon Strip Detectors*. [Master's Thesis, The University of Manchester]. University of Manchester.

Citing this paper

Please note that where the full-text provided on Manchester Research Explorer is the Author Accepted Manuscript or Proof version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version.

General rights

Copyright and moral rights for the publications made accessible in the Research Explorer are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Takedown policy

If you believe that this document breaches copyright please refer to the University of Manchester's Takedown Procedures [<http://man.ac.uk/04Y6Bo>] or contact uml.scholarlycommunications@manchester.ac.uk providing relevant details, so we can investigate your claim.





**Developing a clinician-led smoking intervention
for families and carers of children
attending routine outpatient clinics at
Alder Hey Children's NHS Foundation Trust.**

**Denise Hinton
Jude Robinson
Matthew Peak
Louise Laverty**

HaCCRU Research Report 120/11

June 2011



ACKNOWLEDGEMENTS

We would like to thank the staff at Alder Hey Children's NHS Foundation Trust for participating in this study. In particular, we would like to thank Liz Grady and Moya Sutton for their continued support and invaluable advice throughout the research. Special thanks also go to the families who gave their time to contribute to this study.

In addition, we are extremely grateful for the help and support we have received from The Roy Castle Lung Cancer Foundation and for the valued contribution that Helen Armson has made to the running of this project. We would also like to thank Susie Gardiner and Sandra Davies for their support throughout the research.

FUNDING

This project was funded by the Department of Health and Liverpool PCT.

CONTENTS

ACKNOWLEDGEMENTS	2
CONTENTS	3
Introduction	5
Aims of the study	5
Overview of the research.....	6
Ethics and research management and governance	6
Methods.....	6
Findings.....	7
1. BACKGROUND	10
2. INTRODUCTION	13
2.1 Aims of the study	13
2.2 Overview of the research.....	14
2.3 Ethics and research management and governance	15
3. METHODOLOGY	16
1.1 Clinicians.....	16
3.2 Parents and Carers	18
3.3 Analysis.....	21
4. FINDINGS	23
4.1 Participant Information	23
4.2 Intervention Outcomes	25
4.3 Secondhand Smoke Exposure	27
4.4 Delivering SHS Advice: Clinicians' Perspectives	32
4.5 Receiving SHS Advice: Parents' Perspectives.....	36
4.6 Empowering Parents	40
4.7 Providing an On-Site Smoking Cessation Advisor	43

4.8 Barriers to Delivering SHS Advice	44
4.9 Lessons Learned from this Research Design	47
5. CONCLUDING COMMENTS	49
5.1. Scale of SHS Exposure	49
5.2 Feasibility	49
5.3 Acceptability	50
6 RECOMMENDATIONS	51
REFERENCES	52

EXECUTIVE SUMMARY

Introduction

Exposure to secondhand smoke (SHS) has a significant and detrimental impact on the health of babies before birth, during infancy and childhood and continues to negatively impact on their health into adulthood. Despite a reduction in smoking prevalence in Liverpool, smoking rates remain higher than the national average and many children continue to be exposed to the harmful effects of SHS in home settings. Consequently, there is a need to develop new and innovative ways to facilitate the successful transmission of public health messages to core smoking groups and encourage all families to create smoke-free environments for their children.

Research from the United States suggests there is significant opportunity to develop tobacco control activities in health settings that serve children. The evidence indicates that SHS programmes which seek to reduce children's exposure to SHS can have a positive influence on parents' attitudes and smoking behaviour. According to a recent Cochrane Review, however, it is not clear which programmes are most effective in reducing children's exposure to SHS.

As the first step towards developing a model of intervention for use in the UK a pilot study was conducted at Alder Hey Children's Foundation Trust between 2010 and 2011 to explore the feasibility and acceptability of delivering a clinician-led intervention to families attending routine out-patient appointments.

Aims of the study

The aims of this pilot study were to:

- (1) Establish the feasibility and acceptability of a clinician-led, hospital-based intervention to reduce children's exposure to tobacco smoke, delivered to families and carers of children;
- (2) Explore a range of possible outcome measures to establish the most appropriate post-intervention behaviours on which to base the sample size calculation for a full-scale hypothesis testing study.

The objective of the study was to provide the necessary data to prepare a grant application for a larger, hypothesis testing study, which aimed to reduce the exposure of children to secondhand smoke.

Overview of the research

The research consisted of the following elements:

- Designing the three-phase intervention
- Recruitment and training of clinical staff to deliver the intervention during routine out-patient appointments
- Evaluation of the clinical staff training
- Conducting post-delivery semi-structured interviews with clinical staff
- Administering a post-delivery questionnaire to participating family members and carers
- Conducting post-delivery semi-structured interviews with participating family members/carers
- Analysing secondary data stored at Alder Hey

Ethics and research management and governance

Approval was granted by North West Liverpool East NHS Local Regional Ethical Committee (LREC).

Methods

Twelve clinicians received training to deliver the SHS intervention to families and carers of patients attending out-patient clinics. Clinicians from four clinical specialities agreed to participate in the research; one ENT Nurse Specialist, three Cardiac Liaison Nurses, three Consultant General Paediatricians, two Rheumatology Nurse Specialists, and three Consultant Rheumatologists. Following a four week period of research, ten clinicians were interviewed about their experiences of delivering the intervention during their clinics. Interviews were either individual or group interviews.

One hundred and thirty families agreed to participate in the research and 110 returned a questionnaire. Questionnaire data were entered into SPSSx, a statistical software package, and analysed to inform the aims and objectives of this study.

Ninety semi-structured interviews were conducted with participating families three months after they had received the SHS intervention. All the interview data were transcribed verbatim, and analysed thematically to identify the key themes

Findings

Scale of the problem

Just over a fifth (22 per cent) of the parents and carers who participated in this study said that their child was exposed to secondhand smoke in enclosed private settings. The majority suggested that their child(ren) were exposed to secondhand smoke in other people's homes. We acknowledge that these figures are likely to under-estimate the true extent of children's SHS exposure, as parents and carers may be reluctant to discuss this potentially sensitive topic with their child's clinician. Nonetheless, these data provide an important indicator of the scale of SHS exposure among patients attending routine out-patient appointments at Alder Hey Children's Hospital.

Current Practice

Discussions with clinicians revealed that currently SHS is discussed with parents on an *ad hoc* basis, primarily when the clinician suspects that the parent is a smoker and that SHS may be a contributing factor in the child's condition. However, this means that some clinicians may not address all cases of SHS exposure in children because it may not be immediately obvious that a parent is an active smoker, the smoker in the household may not attend the hospital appointment, or the child may present with a condition which is not directly attributable to SHS. Furthermore, the data suggest that many children are exposed to SHS in other people's homes. Therefore, under the current arrangements there is the potential that clinicians may not identify or address the families of children who are regularly exposed to SHS.

Knowledge

All the parents and carers who participated in the study indicated on the post-intervention survey that they were aware of the harmful effects of SHS to children's health. However the data suggest that many parents and carers learnt something new about SHS and children's health during the consultation with the doctor. This suggests that while families may be familiar with the message that SHS is harmful they may be less certain about the specific risks to child health. As such, this research indicates that there is capacity to further educate

parents about the dangers of SHS and to remind parents and carers that there is ‘no safe level of exposure’. There is a danger that if clinicians automatically assume that parents are aware of this fact, or assume that another health professional has raised this issue with the family, then parents and carers may not be given all the information and advice they need to modify risk factors which may cause or exacerbate their child’s condition.

Feasibility and Acceptability

The research suggests that it is feasible and acceptable for clinicians to deliver a brief SHS intervention to parents and carers of patients attending routine out-patient appointments. The majority of clinicians were able to incorporate the intervention into their consultations and several commented on the ease by which they were able to do so due to the short duration of the intervention. However, clinicians did indicate that they had limited time to discuss SHS with parents and that there may be occasions when it would not be appropriate to raise this issue with a parent or carer. The availability of additional resources, such as SHS literature, appeared to facilitate the successful delivery of the intervention by underlining the key messages, reminding clinicians (with no specialist smoking cessation or advisory training) of the main risks to children’s health and highlighting the range of support options available to smokers and their families.

The research suggests that parents and carers feel it is acceptable to discuss SHS with their child’s clinician during a routine appointment. Interviews with parents and carers revealed that very few families in the sample had ever received information and advice about SHS from a health professional, either at Alder Hey or another healthcare setting prior to the research study. In the survey most families agreed that a hospital appointment was an appropriate time to discuss the dangers of secondhand smoke and believed it was an appropriate message for a clinician to deliver. Parents and carers also suggested that a clinician-led intervention may support parents to educate their children about the risks of smoking and secondhand smoke exposure, which may have the additional advantage of preventing children and young people from smoking in the future.

The research indicated that it was not feasible to provide a dedicated FagEnds specialist smoking advisor in the clinics to compliment the clinician-led intervention. Over the course of a two week period only six people approached the advisor for further information. Consequently, it seemed more appropriate to provide parents and carers with an information pack containing SHS leaflets and resources to take away with them.

Intervention Outcomes

The follow-up interviews revealed that all families who participated in the research could recall something about the information the doctor or nurse had given them. The data indicate that three months after the intervention was delivered a number of parents and carers self-reported either change in their own smoking behaviour or encouraging another person to modify their smoking behaviour around their child.

Although a number of parents and carers reported a change in their own or others smoking behaviours following the intervention, the data suggest that achieving a sustained reduction in children's exposure to SHS is not always a straightforward and linear process. While parents and carers who smoke are able to actively choose to move their smoking outdoors or to quit smoking if they so wish, parents may have limited capacity to shape the attitudes and behaviours of other family members or friends who smoke and pose a risk to their child. The research suggests that clinicians can play a fundamental role in empowering families to protect their children by giving parents and carers, as well as children, the confidence to challenge those who smoke around them

Conclusion

The findings of this research indicate that a considerable number of children who attend Alder Hey Children's Hospital are exposed to SHS in private home settings. Many parents and carers reported other people's homes as a source of exposure. At present, clinicians typically only deliver advice and information to parents whom they suspect are smokers. However, the data suggest that SHS interventions which focus only on parental smoking will only go so far in protecting *all* children who are exposed to SHS.

This research suggests that it is feasible for clinicians to deliver an intervention on secondhand smoke to *all* parents attending routine out-patient appointments. Although clinicians expressed concern about the length of time the intervention may add to each consultation, in reality the intervention was designed to be brief and on most occasions lasted only a few minutes. Parents and carers found the intervention helpful and informative and were able to recall the advice they had been given three months later. The findings indicate that many parents and carers were willing to discuss their smoking behaviours and their child's exposure to SHS openly and honestly with the clinician during the consultation. There is some evidence to suggest that this intervention may influence parents and carers attitudes towards SHS exposure and children's health.

1. BACKGROUND

In Liverpool, approximately 30 per cent of the population are current cigarette smokers. Although there has been a substantial reduction in smoking prevalence in Liverpool over previous decades, rates are still considerably higher than the national average of 22 per cent. The evidence suggests that the number of smokers in the population has continued to decline since the introduction of smoke-free legislation in 2007 (1) but as smoking rates are still high there are concerns that current health messages alone are not sufficient in reaching core smoking groups (2). For example, rates of smoking among pregnant women, teenage girls and the 20-49 year age group remain persistently high despite public health campaigns, the greater availability of smoking support services and the implementation of smokefree legislation (3). In addition, many people, particularly children, continue to be exposed to secondhand smoke (SHS) in home settings (4-7). Consequently, there is a need to develop new and innovative ways to facilitate the successful transmission of public health messages to 'hard to reach' groups and tackle smoking related illness and health inequalities.

Reducing the number of children who are exposed to SHS within home settings is a particular concern because private settings are not regulated by smokefree legislation (3) and adult smoking within home environments is a common site of exposure for infants and children (8-9). For example, approximately 2 million children in England live in a household where they are exposed to second-hand smoke (SHS) and many more are exposed to SHS outside their own home (4). A post-legislation study of home smoking bans in Scotland has indicated that while the overall number of children reporting a complete smoking ban in their household has increased, children living with smokers remain at greater risk of SHS exposure (5). Although research from England suggests that children who live with adult smokers have experienced the most marked decline in SHS exposure when compared to those children living in households where no parent smokes (10). Public health initiatives must therefore focus on encouraging families who smoke to voluntarily implement a smokefree policy in their own homes and instil confidence in parents to ask other people not to smoke around their child in private settings in order to protect their child's health.

Exposure to SHS in childhood is a contributing factor in health inequalities in the UK. Rates of smoking are highest in socio-economically disadvantaged areas and thus levels of SHS exposure are typically higher among children living in the poorest households in the UK (11-

14). Exposure to SHS is damaging to health and is particularly dangerous to infants and children because they spend more time in the home and are unable to move away from the source of exposure (15) and because they breathe more quickly and have smaller less-developed airways (16-17). Research indicates that infants and children who are exposed to SHS are at greater risk of Sudden Infant Death Syndrome (SIDS) and more likely to suffer from a number of conditions including ear disease, wheeze and lower respiratory illness, meningitis, and are also more likely to experience a worsening of asthma symptoms (18-27). Children who live with one or more adult smoker are also at greater risk of cigarette-related injuries (28), house fires (29), school absenteeism (30-31) and becoming an active smoker (32). Treating the effects of SHS exposure in infants and children is estimated to cost the NHS approximately £9.7 million per annum in UK primary care visits and asthma treatment costs, and £12.1 million per annum in hospital admissions in England (4). Efforts to reduce children's exposure to SHS are therefore likely to lead towards improvements in child health and well-being, greater health equality and significant financial savings for the NHS.

Research from the United States suggests that there is significant opportunity to develop tobacco control activities in paediatric health care settings (33). The evidence indicates that parents are receptive to smoking cessation advice delivered in primary and secondary care (34-36) and that programmes which seek to reduce children's exposure to SHS can have a positive influence on parents' attitudes and smoking behaviour (37-41). A recent Cochrane review of programmes to reduce children's exposure to SHS indicates there is insufficient evidence at present to determine the most effective programme to reduce children's exposure to SHS (42). However, only four of the studies were conducted in the UK and the evidence suggests they were underpowered and the study design was not always consistent with good practice. Consequently, there is scope to develop an effective clinician-led SHS intervention for use in UK child healthcare settings

As the first step towards developing a model of intervention for use in the UK this pilot study explored the feasibility and acceptability of delivering a clinician-led intervention to families attending routine out-patient appointments. Addressing children's exposure to SHS is a potentially complex and problematic issue due, in part, to changing attitudes towards the cultural acceptability of smoking and unfavourable perceptions of parents who smoke (43-45). Greater awareness of the harmful effects of SHS on children's health, in particular, may make some parents and carers reluctant to discuss their own smoking or their child's exposure to SHS openly and honestly with a clinician. Research indicates that parents who

smoke experience considerable guilt about their smoking and may construct ‘moral tales’ in order to reconcile their smoking with their capacity to care for and protect their child from health risks (46). Similarly, clinician’s may also be averse to advising parents about smoking due to concerns that families may perceive this to be an unwarranted intrusion into their private life and/or a judgement of their capabilities as a parent (36). Consequently, the subject of SHS needs to be broached in a way which does not stigmatise parents who smoke and which can be incorporated easily into routine clinical practice.

It is also important to acknowledge that children may be exposed to SHS in more than one home environment and that children of non-smoking parents may encounter smoking when they visit the homes of friends and family who smoke (47). Children living in low-income - households, for example, are less likely to be cared for in regulated childcare and informal childcare provided by family and friends may not be smoke-free (48). Moreover, in communities where many people smoke, even if a parent quits smoking then their children may continue to be exposed to smoke elsewhere or others may still smoke in the child’s home (49). Consequently, information and advice about the harmful effects of SHS needs to be delivered to **all** families who attend child healthcare appointments to ensure all families are aware of the risks to their child’s health. The evidence suggests that a harm-reduction approach may be more beneficial to families than simply focusing on smoking cessation, as the creation of smoke-free home environments protects the health of non-smokers and may also operate as an effective precursor to successful quits among smokers through disrupting smoking behaviour (50).

Finally, clear and consistent health messages need to be delivered to families and carers on an ongoing basis to influence the smoking behaviours and attitudes of families over time and ensure all children are protected from the risks of SHS. The evidence suggests that some parents may be sceptical about the harmful effects of passive smoke to child health and believe children are able to tolerate higher levels of smoke exposure as they grow older (51-52). This may make some parents less inclined to instigate changes in their smoking practice on the basis of a one-off intervention. Parents of young children may also encounter difficulty in moving outside to smoke because they are unable to leave young children unsupervised or outside spaces are unsafe for them to smoke (53). Furthermore, the degree to which parents are able to regulate smoking within the home may be constrained by gendered smoking practices (54-56) and unequal power relationships between mothers and fathers (57). Consequently, advice and support needs to be delivered on a regular basis and tailored to the

needs of the family to ensure families feel able and are willing to initiate change either in their own or another person's home in order to protect their child from secondhand smoke.

2. INTRODUCTION

Parents attending out-patient clinics at Alder Hey Children's NHS Foundation Trust do not routinely receive information and advice about secondhand smoke and smoking services. To explore the potential for delivering a second-hand smoke intervention to parents and carers attending out-patient appointments, a four week pilot period of research was conducted at Alder Hey Children's Foundation Trust between 1st and 26th November 2010. This pilot study sought to examine the feasibility and acceptability of delivering a clinician-led intervention during routine clinic slots in the existing clinic templates. Twelve clinicians from four clinical specialities agreed to participate in the research and the intervention was delivered to 130 families attending 21 clinics. This review outlines the main findings of the pilot study.

2.1 Aims of the study

The aim of the pilot study was to:

- Establish the feasibility and acceptability of a clinician-led, hospital-based intervention to reduce children's exposure to tobacco smoke, delivered to families and carers of children;
- Explore a range of possible outcome measures to establish the most appropriate post-intervention behaviours on which to base the sample size calculation for a full-scale hypothesis testing study.

The objective of the pilot study was to generate the data to prepare a grant application for a larger, hypothesis testing study, to reduce the exposure of children to secondhand smoke. The purpose of the pilot was to ascertain if a clinician-led SHS intervention would lead towards:

- a) Effective and sustained changes to family members/ carers (attitudes towards) smoking behaviours that reduce children's exposure to second-hand smoke;
- b) An increase in referrals by targeted family members/ carers to a smoking cessation service;
- c) Reduced repeat attendances at the clinics by the children of the family members/ carers who have changed their smoking behaviours and/or an overall improvement to their health.

2.2 Overview of the research

There were five stages to the research:

- (i) A three phase intervention was developed for use by clinicians during routine appointments with patients and their families (58). The purpose of the intervention was to:
 - enhance the knowledge of family members
 - assist them to change their behaviours through altering their attitude towards (their) smoking behaviour
 - develop the skills family members need to effect any changes

The intervention focused on:

- a) Raising awareness of the need for children to live in a smoke-free environment
- b) Identifying when and where the child is exposed to tobacco smoke
- c) Discussing with the family how this may change

Families had the opportunity to speak to a dedicated smoking advisor from FagEnds after their consultation if they wanted further advice or support.

- (ii) Twelve clinicians were recruited to the study and took part in a one hour training session in October 2010. The training session was designed to prepare clinicians to deliver the intervention to parents of patients attending routine appointments in out-patient clinics. During this process clinicians were able to comment on the design of the intervention and the feasibility of delivering it to families attending their clinics. All comments and suggestions were incorporated into the final design of the pilot study.
- (iii) At the end of the period of data collection clinicians were interviewed about their experiences of discussing SHS with parents and their views on the feasibility of incorporating the intervention into routine practice.
- (iv) All family members/ carers who received the intervention were asked to complete a short questionnaire about the content, timing and delivery of the intervention immediately after their consultation.

- (v) We attempted to contact all participating families by telephone three months after the intervention had been delivered to see if they had made any changes which would reduce children's exposure to secondhand smoke. The follow-up telephone call also provided an opportunity to discuss the intervention and any barriers or facilitators to change in more detail with parents.

2.3 Ethics and research management and governance

As the study involved NHS staff and families of patients attending out-patient clinics at Alder Hey Children's NHS Foundation Trust, ethical approval was sought and granted by Cheshire North West Liverpool East Local Regional Ethical Committee (LREC), and further approval was granted by the Liverpool Primary Care Trust Research Management and Governance Office.

3. METHODOLOGY

This research used a mixed methods approach, combining a survey with semi-structured interviews, to generate a detailed picture of the acceptability and feasibility of delivering a clinician-led SHS intervention in secondary health care settings which serve children. The advantage of using a mixed methods approach is that quantitative data may be used to indicate population-level trends and the qualitative data may be used to explore individual behaviour and attitudes in more detail to move the study beyond simple descriptors of social action (59-60). This generates a more comprehensive understanding of the topic under examination based on a representative sample of the study population and the research findings can be validated by the cross-verification of data to ensure accurate findings are reported (61).

1.1 Clinicians

Clinician Recruitment

Twelve clinicians from four clinical specialities were recruited from Alder Hey Children's NHS Children's Trust to deliver the SHS intervention to parents of patients attending their out-patient clinics; one ENT Nurse Specialist, three Cardiac Liaison Nurses, three Consultant General Paediatricians, two Rheumatology Nurse Specialists, and three Consultant Rheumatologists. All participating clinicians attended a short training session delivered by Denise Hinton and Louise Lavery which lasted for approximately one hour in October 2010. During the training session clinicians were briefed about the research and had the opportunity to comment on the study design and the feasibility of incorporating the intervention into routine practice. Training sessions covered the following topics:

CLINICIAN TRAINING:

Context

- Effects of SHS exposure on child health
- Scale of the problem

Evidence Base

- Current research on SHS interventions
- Gaps in the knowledge
- Developing a UK SHS intervention model

The Intervention

- Raising the issue
- Providing information and advice
- Enhancing motivation
- Moving towards changing behaviour
- Suggesting solutions and building confidence

- Further information (signposting)

The Research Process

- Parent and carer recruitment
- Paperwork
- Follow-up interview

Additional Information

- Opportunity to ask questions and enhance understanding
- Opportunity to provide feedback on the intervention design and research process

All training sessions were digitally recorded (with the permission of the clinicians). Eleven clinicians delivered the intervention to parents and carers of patients attending their clinics over a four week period in November 2010.

Clinician Interviews

Ten clinicians were interviewed by Denise Hinton after the period of the intervention to evaluate their experiences of taking part in the study. Interviews lasted between 20 to 50 minutes and were digitally recorded. Six clinicians were interviewed individually and four clinicians from the same clinical speciality were interviewed as a group. Interviews were guided by the following questions and additional topics were explored depending on the clinician's response:

CLINICIAN INTERVIEW GUIDE:

About them:

Their clinical role and responsibilities.
 Their reason for taking part in the research.
 Their previous experience of delivering smoking cessation and/or secondhand smoke advice to families.

Training:

Their views on the training and whether this equipped them with sufficient knowledge to deliver the intervention in clinics.

Delivery:

- Their experiences of talking to families and patients about secondhand smoke; how did they raise the issue during the consultation, was the intervention guide helpful and how did they feel about discussing this subject with parents?
- How did parents react to the intervention? Did parents who smoke react differently to parents who were not smokers?
- Were there any occasion when either they felt or the family appeared to be embarrassed by this discussion?
- Were there any occasions when it would have been inappropriate to raise the issue of secondhand smoke with parents? If so, how did they deal with this issue?

- Would they prefer to target information at families who smoke?
- Did they offer any additional information and advice to families about their smoking?
- Was it useful to direct families towards a specialist smoking advisor?

Timing:

- Approximately how long did it take to deliver the intervention during a consultation? Was this appropriate or does this need to be altered?
- What effect, if any, did the intervention have on the clinic template and patient waiting times?
- At what point in the consultation did they choose to deliver the intervention?
- How feasible would it be for them to accommodate this intervention during every consultation in a standard clinic template?
- Have they continued to deliver the intervention to parents after the research period ended?

Impact

- What questions, if any, did parents and carers raise following the intervention and did the clinician have sufficient knowledge to answer these?
- What impact do they think this intervention will have on children's exposure to secondhand smoke?

Additional Information

- Their views on how the intervention and any future research design should be modified.
- Their views on recording parents' response to the intervention and how this should be followed up in future appointments.
- Any further comments, insights or suggestions about creating smoke-free environments for children.

3.2 Parents and Carers

Parent and Family Recruitment

With the assistance of the medical records and IT department at Alder Hey, all parents/carers of patients due to attend selected out-patient clinics in November were sent a letter one week prior to their appointment informing them about the research study. The letter provided parents with information about the study and included the contact details for Denise Hinton and Jude Robinson so parents could access further information about the study if they wished.

Depending on the clinic, parents of patients were then approached to take part in the study either when they booked in at the reception desk or immediately after their child had been weighed and measured. If parents agreed to participate in the study then they were asked to complete a consent form and they were given a questionnaire to complete after the consultation. Further copies of the study information leaflet were offered to parents. A blue form was attached to the front of the patient's medical record before it was passed to the clinician so the clinician was aware that the parent had given consent to take part in the study. The clinician recorded the parent and carers responses on this form.

It should be noted that sufficient funding was built into the pilot grant to allow us to ‘buy out’ clinic time, when necessary, to ensure clinic waiting times would not be breached in participating clinics during the research period. We anticipated replacing patient slots within existing clinic templates with ‘research’ slots to ensure clinicians had sufficient time in their clinic to deliver the intervention. In the process of setting up the research, however, it proved difficult to put this into practice. Consequently, we limited the recruitment of participants to the study for the first week of the study in order to gauge the impact of the intervention on clinic time. With the agreement of individual clinicians we sought to increase the number of participants we recruited per clinic over the course of the four week research period. This meant that not all parents attending the participating clinic were approached to participate in the study. In some clinics it was necessary to limit recruitment to the study because the clinic was overbooked and clinicians were concerned about patient waiting times. Some parents were also ‘missed’ because other parents were in the process of signing up to the study and it was not possible to recruit more than one parent at a time. There was also an issue with finding a suitable location to sign parents up to the study in some clinics which also hindered participant recruitment.

Following a four week period of data collection conducted a total of 147 parents/carers agreed to participate in this study (see Table 1 for further information). In some instances more than one parent per patient agreed to participate in the study (typically the mother and the father of the patient) so in total 130 families consented to receive the intervention. Nine per cent of eligible parents declined to participate in the study. The majority of parents who declined to take part in the study said they were non-smokers and did not think the study would be relevant to them.

A total of 21 consented families did not receive the intervention either due to time pressures in overbooked clinics or because the clinician had forgotten to deliver the intervention. This issue was explored in more detail during the interviews with clinicians.

Table 1: Participant Recruitment

	Number of patients attending all participating clinics	Number of parents/carers approached to participate in study (number of families)	Number of parents/carers declined to participate in study	Number of parents/carers agreed to participate in study. (Number of families)
Week 1	63	36 (34)	3	33 (31)
Week 2	60	45 (38)	4	41 (34)
Week 3	65	45 (40)	4	41 (36)
Week 4	52	35 (32)	3	32 (29)
TOTAL	240	161 (145)	14	147 (130)

Parent and Family Survey

Each parent and carer recruited to the study was given a short questionnaire to complete immediately after the consultation had ended. The questionnaire explored parents and carers' views about the content, timing and delivery of the intervention and also their attitudes towards secondhand smoke exposure and how it relates to child health. An example questionnaire is included in appendix 1. The majority of parents and carers who completed a questionnaire did so in the waiting area, although a small number (eight) were returned by post. In total, 127 questionnaires (86 per cent) were returned. Questionnaire data were coded and entered into SPSSx for analysis

Parent and Family Interviews

All of the participating families were contacted by letter three months after they had received the intervention at Alder Hey inviting them to participate in a telephone interviews. Denise Hinton called each parent approximately three to four days after the parent had received the letter to ask if the parent and carer were willing to discuss the information they had received from the hospital and to arrange a convenient time and date to conduct the interview. Contact was made with 89 families (68 per cent) and 76 families recalled receiving the intervention from a clinician.

Ninety parents agreed to take part in brief interview over the telephone with Denise Hinton. Interviews lasted between 5 and 35 minutes and were digitally recorded. In the initial protocol it was proposed that participants would be asked to take part in a short structured interview over the telephone and then up to twenty family members/carers would take part in a longer follow-up interview to describe their children's exposure to tobacco smoke in more detail. However, it proved difficult to recruit parents to participate in a further interview. Consequently, we decided to alter our approach and use one semi-structured interview with parents and carers to explore their views on children's health and SHS exposure in more detail. Interviews were therefore guided by the following questions and additional topics were explored depending on the parent's response:

PARENT AND CARER INTERVIEW GUIDE:

About Them

Relationship with child
Employment status and occupation

Smoking status

Have they contacted a smoking advice service beforehand?

The Intervention

- What can they remember about the advice the doctor or nurse gave them when they talked to the parent/carer about SHS?
- What changes, if any, have they made since receiving information on passive smoke from the doctor or nurse?
- What prompted the change?
- How do they feel about this change?
- Have they talked to anyone else (such as a grandparent) about smoking around their child?
- Has they raised this issue with this person before?
- How did this person respond?
- Do they still have concerns about this person smoking in front of their child and, if so, how do they feel about this?
- Did they take away any leaflets about SHS on the day they attended the clinic appointment?
- Has a doctor or nurse ever discussed SHS with them before?

Views

- How did they feel about discussing secondhand smoke exposure with their child's doctor?
- How did they feel about discussing secondhand smoke exposure in front of their child?
- Is there anything else they would have liked the clinician to have discussed?
- Do they have any concerns about SHS exposure and their child's health?

Secondhand Smoke Exposure

- Are there any smokers living in their household and, if so, where do they smoke?
- Do they take any precautions to keep children away from SHS
- Does anybody smoke in the car when the children are there?
- Does the child(ren) spend time in the home of anyone else who smokes and, if so, where does this person smoke while the child is there?
- Does the child(ren) spend time in another vehicle where people smoke?

Further Information

Is there any further information they would like to add about the intervention?

3.3 Analysis

All the interview data were transcribed verbatim and analysed thematically to identify the key ideas, beliefs and assumptions that shaped participants' discourse and experience. This report presents the main findings, although further analysis will be conducted to embed the data within the wider literature on programmes to reduce children's exposure to SHS and parents responses to clinician-led public health interventions. The analysis has been sensitive to any gaps and silences in the interviews, as we acknowledge that parents may be reluctant to discuss their children's exposure to secondhand smoke and/or their own smoking behaviour with their child's clinician and in the presence of their child. However, we did note that the majority of participants discussed their (attitudes towards) smoking and secondhand smoke openly and honestly with both the researcher and the clinician.

4. FINDINGS

This section outlines the main findings of the pilot study detailing the main characteristics of the participating clinicians and families and their attitudes towards the intervention. The discussions with clinicians and parents and carers have been combined so that it is possible to compare and contrast their beliefs and experiences.

To maintain the confidentiality and anonymity of the participants, all participants are identified by a personal identity code. Codes which begin with 'C' indicate clinicians and codes which begin with 'P' indicate parents/carers. Where the interviewer is quoted (DH) the words appear in bold.

4.1 Participant Information

Clinicians

Twelve clinicians were recruited to the study and 11 delivered the intervention during their out-patient clinics over a four week period. The participating clinicians included six Consultant Paediatricians, five Nurse Specialists and one Allied Health Professional. Three clinicians were men and nine were women.

Parents/Carers

One hundred and forty seven parents and carers were recruited to the study. Just over three quarters of the sample were women (78 per cent) as more women (typically the mother) accompanied patients to appointments than men. Parents and carers were recruited from all age brackets (see table 2) although the majority were 35-44 years of age. No parent or carer was aged under 18 although the ethical issues associated with gaining informed consent from parents/carers who are under 16 years of age needs to be addressed in any future study. The majority of participants self-identified as 'any White background' (80 per cent) when asked to indicate their national identity (see table 3).

Participants were asked to provide the postcode of their main residence when they consented to participate in the study. Table four indicates that while the majority of participants were living within the Liverpool 'L' postcode area (60.5 per cent), over a third (37.5 per cent) were living in postcode areas outside the Liverpool postcode area, including Preston (10.2 per cent), Warrington (9.5 per cent) and Crewe (6.8 per cent). It is important to take the location of parents and carers of patients into account when designing any future study, as the

intervention needs to be linked to a smoking advisory service which all parents and carers are eligible to use. For example, while it would be appropriate to direct someone from the Liverpool postcode area to FagEnds, this service is not suitable for a parent/carer living in areas not covered by FagEnds. Instead, parents and carers who live in other areas need to either be directed towards a national advice line or their local smoking-advice service. Moreover, it should not be assumed that all parents and carers will be familiar with the FagEnds smoking advice service (or another local smoking advice service). Clinicians may need to explain what FagEnds or any other suitable local service can provide for interested parents/carers. This point warrants further examination in any future study.

Table 2: Age

	Frequency	Percentage
18-24	7	5
25-34	39	27
35-44	52	35
45-54	18	12
55-64	4	3
65-74	2	1
Missing	25	17

Table 3: Ethnicity

	Frequency	Percentage
Bangladeshi	2	1
Indian	1	1
Any White Background	118	80
Prefer Not to Say	3	2
Missing	23	16

Table 4: Participant Location (by postcode)

	Frequency	Percentage
L Liverpool	89	60.5
PR Preston	15	10.2
WA Warrington	14	9.5
SK Stockport	4	2.7
MA Manchester	1	0.7
WN Wigan	2	1.4
CW Crewe	10	6.8
CH Chester	6	4.1
SY Shrewsbury	1	0.7
TF Telford	1	0.7
IM Isle of Man	1	0.7
Missing	3	2.0

Smoking Prevalence

Twenty three parents and carers in this sample self-identified as being an active smoker during the consultation with the clinician. It is important to underline that parents revealed this information without being asked directly by the clinician about their smoking status. This suggests that it is not always necessary to ask the question ‘are you a smoker’, or ‘are there any smokers in the household’, to elicit parents’ smoking behaviours. In total thirty three families (30 per cent) who received the intervention said that their child(ren) lived in a household with one or more adult smokers. Twenty eight families (26 per cent) said that their children visited grandparents who were smokers and 11 (10 per cent) families said that their children visited other family members and friends who smoked.

4.2 Intervention Outcomes

Knowledge and understanding

The follow-up interviews revealed that all families who participated in the research, with the exception of those parents and carers who did not receive the intervention, could recall something about the information the doctor or nurse had given them. The following examples are illustrative of the information parents and carers could recall being given by the clinician:

What you can you remember about the advice the nurse gave you when they talked to you about passive smoking?

Just it lingers in the air for about 6-8 hours; even if you smoke outside it’s still stuck on your clothes; you literally have to wash the clothes and shower before any traces of the smoke are off you, type of thing. But I’d known that already so, basically, when they asked these questions that was the answers I was hitting them back with. (P1702C6)

Erm well just not to smoke around children at all and to smoke outside. I mean I don’t know how anyone who comes to the house smokes anywhere near, even in the house they have to smoke right outside with like doors closed, I don’t let anybody smoke around my children...and that’s what I got from it. And even if you are outside to close doors and stuff because it can blow back in and stuff. (P2611C2)

I suppose I agree with it all so I’m not sure whether I remember it or whether it was just in my head. No amount of passive smoking is acceptable in any shape or form in and around children, in and around anybody as far as I’m concerned especially children. I wouldn’t allow and don’t encourage it in any shape or form. My family are like me they’ll all against it because it causes so much damage. (P0402C9)

As the majority of parents and carers indicated that they had some knowledge of the harmful effects of SHS to children's health prior to the study, there is the potential that their responses were based on an amalgamation of the clinician's message with knowledge they had acquired via other sources such as public health media campaigns. For instance, several parents and carers suggested that clinicians had advised them it was harmful to come into close contact with a baby or child immediately after smoking and that they should shower and/or wait at least twenty minutes before picking a child up after having a cigarette. However, the SHS intervention that clinicians were asked to deliver for this research did not contain this specific message, which suggests that parents combined the clinician's advice with lay beliefs and prior knowledge. The clinician can therefore play a key role in updating parents and carers on the most recent research and advice on SHS exposure.

Behaviour and attitude change

As there have been a number of smoke-free campaigns, including the '7 steps' campaign which was promoted shortly before this research started (62), it is not possible to attribute any self-reported behaviour or attitude change among parents and carers solely to this SHS intervention. As the purpose of the study was to assess the acceptability and feasibility of delivering a clinician-led SHS intervention during routine consultations, the changes outlined below are thus indicators of possible parameters which may be used to assess the effectiveness of the intervention in a future study.

The data indicate that three months after the intervention was delivered a number of parents and carers self-reported either change in their own or encouraging another person to modify their smoking behaviour. We were able to contact 27 parents and carers whose child lived in a household with one or more smokers and they reported instigating the following changes in the time since they had received the intervention:

1. Two parents reported quitting smoking
2. Three parents reported cutting down the number of cigarettes smoked per day
3. One parent reported moving right away from the house when smoking outside (although, as we acknowledge above, the extent to which this is directly attributable to this intervention is undetermined)
4. Two parents reported stopping smoking in the car
5. Four mothers reported asking their (former) partner to make a change to their smoking behaviour

A further ten parents in the sample reported asking family members to modify their smoking behaviour in the presence of their child.

In some instances, the intervention was reported by parents as having an instant impact on parents' attitudes towards children's SHS exposure and prompted immediate behaviour change. Parents and carers who implemented a smoking ban in their car or home or had spoken to another person about their smoking behaviour, for example, had made this change soon after the intervention was delivered. In contrast, parents and carers who reported cutting down the number of cigarettes they smoked or quitting smoking had not done so immediately and did not necessarily view the intervention as a pivotal factor in their decision. Rather, parents and carers who cut down or quit indicated that they had contemplated change prior to the consultation and regarded the intervention as a useful reminder of the harmful effects of smoking and as such it acted as a gentle nudge to modify their behaviour. This suggests that the intervention may support wider tobacco control initiatives to encourage parents to consider modifying their smoking behaviour but may not always lead to immediate change.

However, there are limitations to these data because results are based on parental self-report rather than robust objective measures. Current evidence suggest that studies which rely on self-report tend to underestimate smoking prevalence in a population (63). Furthermore, it is not clear whether reported changes in the smoking behaviours of parents and/or other family members have led to a sustained reduction in children's exposure to SHS. Therefore, it is not possible to ascertain whether this intervention has a statistically significant effect on children's SHS exposure. Consequently, a more reliable measure of children's exposure to SHS prior to and following the intervention must be incorporated into future studies to ensure accurate and robust findings are reported.

4.3 Secondhand Smoke Exposure

Many of the families (78 per cent) who took part in the study informed the clinician that their child(ren) were never exposed to secondhand smoke. Nearly a third (30 per cent) of parents and carers in this study said that they had no family or friends who smoked and did not spend time with anyone who smoked, and as a consequence they did not have to actively implement strategies to avoid SHS exposure. Several non-smoker parents remarked that smokefree legislation had played a key role in helping them to protect their child from SHS exposure in public spaces. Whereas in the past many families had chosen to avoid visiting enclosed public places where their child was likely to come into contact with SHS, they were now able

to enjoy taking their children out to restaurants and pubs without worrying about the effects of SHS exposure. Moreover, several non-smokers commented that they now rarely came into contact with secondhand smoke following the ban in 2007.

There was also evidence that a number of smokers in the sample took steps to protect their children from the harmful effects of SHS. In the sample, 23 families who lived in households with one or more adult smokers said that all cigarettes were smoked outside the house and that their children did not breathe in any secondhand smoke. Fifteen families also said that grandparents who were smokers had voluntarily implemented a home smoking ban and many chose not to smoke at all when their grandchildren visited. One mother described the lengths her parents went to, to keep their grandchildren away from smoke:

No, my mum and dad both smoke...but they don't smoke at all in the house and ... I don't mean my house I mean in their own, they smoke outside in the garden and when the kids are coming down they don't smoke for a good few hours before they come down. They are quite good actually and they don't smoke at all whilst they are around them or anything, they wait until they've come back home before they smoke...my sister had kids before me, but as soon as my sister had her first child, they've always done that, they've always smoked outside and everything. Even when no one's there they didn't smoke in the house. They make a point now to go outside. (P2404C6)

These data support the findings of other studies which suggest that an increasing number of households are choosing to implement a home smoking ban in response to public health guidance, smokefree legislation and changing attitudes towards smoking in the presence of children (5, 50). Indeed several parents commented on the fact that their own parents had smoked in front of them when they were a child but had voluntarily implemented measures to protect their grandchildren from exposure to secondhand smoke. These changes were often attributed to greater awareness of the risks of smoking, both to the smoker and to those around them, as one father explained:

My Mum smokes outside when we visit, she lives down in [town] and when I grew up Mum and Dad always smoked around me, I think that's why I don't smoke around the kids now...once me and my sister had children, Mum never smoked around the kids and has always smoked right outside in the back yard, right away from them...my Mum was a youth community worker and has seen the changes in the youth club, with people no longer being able to smoke in the building and things, so she knows to keep the kids away from the smoke. Things have changed now people are much more educated than they were years ago. (P1203C8)

The view that people are much more knowledgeable about the dangers of smoking nowadays was a common theme that ran throughout the interviews with families and clinicians. Discussions with families indicated that many parents could not understand why people would continue to smoke either when pregnant or in front of children when the dangers of SHS to child health were perceived to be common knowledge.

Furthermore, clinicians also suggested that any discussion with families about secondhand smoke would serve to remind the parent about the dangers rather than impart new knowledge about the risks of smoking, as this clinician explained:

It's not a message that they don't know is it? It's just reiterating it and it's also making them aware that they might be affecting their child's health and it's just from a different angle and I think that's a real motivating factor for people to give up smoking. If they think it's affecting their child's health. (C1)

This clinician suggests that continual reminders may motivate parents and carers to consider the impact that exposure to SHS could have on their child's health and thus make a positive change to their behaviour. It is therefore worth repeating information on a regular basis to ensure families are aware of the dangers and to encourage and support parents and carers to make change.

However, another clinician implied that there may be little value in investing additional time to relay a public health message that parents are presumably aware of and actively ignoring, as this comment illustrates:

You tend to go in cycles of this and go through the sort of defeatist ... well what good does it do and you just waste more time saying it, you assume people know it and they're smoking anyway (C9)

Ultimately, the effectiveness of key public health messages will rely on the attitudes and willingness of staff to deliver advice and information to parents on a regular basis. The assumption that people are already aware of the dangers of secondhand smoke may mean clinicians are reluctant to raise this topic with parents, particularly if they have other issues to discuss during a relatively short consultation. There is also the potential that clinicians may assume that this advice has been delivered by another health professional. This may mean some parents are not given the opportunity to discuss the effects of SHS on their child's health.

Children at Risk

While a large proportion of the sample indicated that their child(ren) were not exposed to SHS, the data indicate that SHS exposure remains an issue for a considerable number of children. During the consultation with the clinician, 24 parents and carers (22 per cent) said their child(ren) were exposed to second hand smoke in enclosed private settings. Nine families said their child(ren) were exposed to SHS in their own home, four said their child(ren) were exposed to SHS in the family car, and 17 said their child(ren) were exposed to SHS in another person's home. Grandparents' homes were cited as a common source of exposure. A number of families said their child(ren) were exposed in more than one location. Therefore a number of children were around other people's smoke in their own and other people's homes. A further five people said their child(ren) were exposed to second hand smoke in outside public spaces, including school, college and bus shelters.

In its current form, the intervention only records children's exposure to SHS by parental report. Parents' reports were not combined with additional objective measures of children's cotinine levels, such as serum or hair cotinine testing (64), to verify the accuracy of reported exposure. In addition, the level of children's exposure to SHS will differ according to the frequency and duration of time spent in the presence of someone who is actively smoking. For example, some children may be exposed to high levels of SHS on a daily basis whereas others may only visit a smoker once a year. We therefore acknowledge that these figures are likely to under-estimate the true extent of children's SHS exposure, as parents and carers may also be reluctant to discuss this potentially sensitive topic with their child's clinician.

Nonetheless, these data provide an important indication of the scale of SHS exposure among patients attending routine out-patient appointments at Alder Hey Children's Hospital. These data demonstrate that there is a need to remind parents of the harmful effects of SHS to their child's health when they attend routine out-patient appointments and equip families with suitable strategies to protect their own and their children's health. Furthermore, although there are a number of reasons why parents/carers may choose not to disclose an accurate version of their smoking behaviours to a clinician, it is crucial to highlight that in spite of these factors, a number of parents and carers *did* talk to the clinician about smoking in the home. This demonstrates that there is potential for clinical staff to discuss the subject of children's exposure to secondhand smoke openly and honestly with parents and carers during routine appointments.

Enhancing knowledge

All the parents and carers who participated in the study indicated on the post-intervention survey that they were aware of the harmful effects of SHS to children's health. During the follow-up interviews parents and carers regarded SHS as a well-publicised and well-known public health issue and many recalled reading posters and leaflets, seeing advertisements on the television or receiving information about SHS from their child's school. Despite the familiarity of this message, however, it was interesting to note that 60 per cent of the sample indicated that they learnt something new about SHS and children's health during the consultation with the doctor. A number of parents were unaware that parental smoking could increase the risk of a child developing middle ear disease, for example, as one clinician explained:

There were a couple [of parents] that I remember were very surprised about the glue ear they were quite 'Oh really' very surprised at that, so when we mentioned some of the effects you can get through smoking they were surprised. (C7)

This suggests that while families may be familiar with the message that SHS is harmful they may be less certain about the specific risks to child health [ref]. As such, this research indicates that there is capacity to further educate parents about the dangers of SHS, particularly when children present with a condition, such as glue ear, which is directly related to SHS. There is a danger that if clinicians automatically assume that parents are aware of this fact, or assume that another health professional has raised this issue with the family, then parents and carers may not be given all the information and advice they need to modify risk factors which may cause or exacerbate their child's condition.

Furthermore, the survey data indicated a degree of uncertainty about the measures parents and carers could implement to protect children from SHS. The majority of parents and carers (98 per cent) disagreed with the statements 'It is ok if children sometimes breathe in secondhand smoke in their own home' and 'It is ok if children breathe in some secondhand smoke when they visit people who smoke'. However, a number of parents believed that it was possible to smoke inside their home and protect children from the harm of SHS. For example, seven parents thought that smoking near and open door or window would stop their children breathing in SHS smoke, 26 parents believed that smoking in the house after children have gone to bed is not harmful to children's health, and five parents stated that it is ok to smoke in the house if the children are in a different room. These data indicate that a number of parents and carers need to be reminded that there is 'no safe level of exposure' to

SHS (65) and require (further) information about creating smokefree homes for their children.

4.4 Delivering SHS Advice: Clinicians' Perspectives

Current Practice

Alder Hey Children's Hospital has been accredited by the World Health Organisation as a Health Promoting Hospital and takes an active role in promoting public health messages to patients and their families, staff and the wider community (66). In collaboration with Smoke Free Kids, Alder Hey has led a major public health initiative to increase awareness of the harmful effects of passive smoke to children's health. Banners, posters and literature are displayed in prominent locations throughout the hospital to inform families and visitors about the importance of maintaining smoke-free environments for children and FagEnds hold regular 'Smoke Free Families' events in the canteen and clinic waiting areas throughout the year. However, although health professionals working at Alder Hey recognise that children's exposure to SHS is an important issue, interviews with participating clinical staff suggests that not all clinicians routinely deliver advice to parents and carers about the dangers of SHS during out-patient appointments. This may be due to a number of reasons.

Firstly, as one clinician explained, when discussing children's exposure to SHS there is the potential that parents may perceive the clinician to be criticising their (smoking) behaviour:

Because you are confronting someone's behaviour, you're telling someone that their behaviour is wrong really and that's quite a judgment to pass on a relative stranger really. And what right have we got except we're here as advocates for the children and if we honestly believe it could be detrimental to the child then I think it's our job to say something. (C4)

Clinicians may therefore be reluctant to address the issue of SHS if they are concerned this may place stress on their relationship with the child's parents. This may be of particular concern if the clinician needs to gain the trust and cooperation of a parent in order to treat a patient effectively. Moreover, although the clinician may be motivated to act in the interests of the child there is the recognition that there are limitations to the influence a clinician may have on shaping parental attitudes and behaviours, as this clinician explains:

All our role is, is really keeping the child safe in a sense. We're not ... as much as we want to encourage healthy lifestyle and things within a family and good eating and not smoking and all the rest ... we don't have that direct responsibility for the parents. (C1)

Several clinicians commented on the complexities of delivering public health advice in a paediatric environment where it is necessary to develop good relationships with parents but it is the child whom the clinician has direct responsibility for. Discussions with clinicians suggested that clinical staff felt more comfortable raising the issue of smoking with families when they suspected the parents were smokers and the child's condition was likely to be caused or exacerbated by exposure to other people's smoke. As these clinicians explain, being able to link the child's condition to SHS exposure allowed them to steer the conversation around to smoking and gave them a legitimate reason for enquiring about families private lives. This in turn helped facilitate a discussion about how parents could modify their (smoking) behaviours to in order to protect their child's health:

Can you briefly tell me whether you have discussed passive smoking with parents in the past?

Only when it came up in conversation, so if it was clear that the parents were smokers then I would ask about it then or, if I suspected that the parents were smokers, but it was only if they kind of introduced it or if it was easy to carry on that thread of conversation so I could pick up on it. It certainly not something that I've done in my routine practice.... if we'd seen a child with wheeze then of course I would ask about smoking or ... but because we're not dealing with respiratory conditions it's not quite as definitely relevant. So I think our questions about it have not been at the forefront. (C1)

I tend to ask mum's who have the right sort illnesses in their kids.... respiratory illnesses, bronchitis, if they smoke and have been directing people through FagEnds....but I tend not to ask it as a standard question if it's not directly relevant to that child's illness, for time reasons much for anything else. (C2)

Okay well I am quite good now at detecting if actually a parent does smoke and if I suspect it I will deliver a brief intervention of 'Oh is there any smoking in the family?' and then the conversation gets going then and then I can start delivering ... I would say I'm non-judgmental and it's about advice. (C6)

These data suggest that currently SHS is discussed with parents on an *ad hoc* basis, primarily when the clinician suspects that the parent is a smoker and that SHS may be a contributing factor in the child's condition. However, this means that some clinicians may not address all cases of SHS exposure in children because it may not be immediately obvious that a parent is an active smoker, the smoker in the household may not attend the hospital appointment, or the child may present with a condition which is not directly attributable to SHS. Therefore, under the current arrangements there is the potential that clinicians may not identify or address the families of children who are regularly exposed to SHS.

Delivering the Intervention

During the research period clinicians were asked to deliver the intervention to all parents and carers who had agreed to participate in the research. Clinicians were requested to avoid asking parents directly about their smoking status (although many parents did volunteer this information) to both avoid stigmatising parents who did smoke and to gather information about other places where children may come into contact with other people's smoke. Although, clinical staff did not normally deliver SHS guidance to all parents during a routine clinic, several clinicians commented on the ease by which they were able to incorporate this information into their daily practice, as the following comment illustrates:

In the majority I found it very easy, I know there were some patients who I saw who we didn't do the intervention .. I think you know there were some cases where just the clinical consultation had been quite complicated, quite long and it didn't .. we ran out of time/it just didn't feel like it was appropriate at that point, but I think in general terms I found it very easy. I found it felt a very appropriate thing to do and I felt it could be quite easily incorporated into that clinical contact. (C8)

Although, as this clinician acknowledges, there were situations where clinicians felt it would be inappropriate to raise the issue of SHS with parents, overall clinicians indicated that they found it relatively straightforward to accommodate the intervention in their routine consultations during the research period. One advantage of this intervention was that clinicians were not required to target the information at suspected smokers, as this clinician explains:

I think I feel more comfortable targeting everybody than trying to prejudge who smokes and who doesn't smoke. (C1)

Moreover, several clinicians believed a hospital appointment was a suitable time to address the issue of SHS because the majority of parents and carers responded positively to the intervention:

I think they're motivated certainly, when we've discussed it within this study, I think a lot of the parents seem to give the impression that they were quite happy about it being talked about. Some of them in particular, would expand a great deal and you kind of thinking 'Right I need to close this now'. My clinics over ... but I think it is an appropriate place to raise it (C1).

Although this clinician suggests there is insufficient time to explore the subject of SHS with families in detail, they do indicate that it would be appropriate and feasible to deliver a brief

message to all families during routine consultations, and that families are receptive to this advice. Another clinician suggested that the SHS message could be tailored to the suit the needs of the family, so that the actual amount of time dedicated to delivering this message would differ depending on the parent's response:

Well the length of it depends on the response. So you have an opening gambit. If the opening gambit goes somewhere you'll feel fine, it's worth spending another 30 seconds of your consultation, if that goes somewhere and they are looking to do something, you may actually spend another five minutes. If it's going nowhere off your opening gambit you wouldn't invest all that extra time, so it's a staged approach. (C2)

Indeed, a number of clinicians did point out that time constraints (particularly over-booked clinics) and competing healthcare priorities were the main issues they had to contend with when delivering this intervention to families. On a number of occasions, clinics were over-booked and behind schedule, so clinicians were concerned about lengthening their consultation by adding additional information. In other instances, clinicians had a number of issues to address during a patient's appointment and did not want to over-burden their parents/carers with additional information they was unrelated to their child's medical condition. However, several clinicians indicated that they found it helpful to have the option to direct parents to a specialist smoking advisor (for the first two weeks of the study only) or offer them an information pack containing leaflets on SHS, so that they could briefly deliver an intervention and then allow parents to access additional information at their own leisure away from the consultation room. The leaflets proved to be a popular, as clinicians could use them as a guide to draw parents and carers into the conversation and highlight the relevant facts about secondhand smoke, as this clinician explains :

I thought the leaflet was very helpful actually, it was very colourful and presented things very well and that could easily be added if you just say 'We have these leaflets, do take one and let me just draw your attention to the passive smoking aspect' I think those were very good and I spent quite a bit of time just using them actually, just to go through. (C9)

Another clinician also suggested that parents were more likely to take notice of a leaflet distributed by a doctor than one they received from a specialist smoking advisor or picked up in the clinic waiting area:

To be honest, I think a leaflet given out by the doctor is actually going to carry a lot more weight than a leaflet handed out by somebody who has no link to the family (C2)

The availability of additional resources, such as SHS literature, appeared to facilitate the successful delivery of the intervention by underlining the key messages, reminding clinicians (with no specialist smoking cessation or advisory training) of the main risks to children's health and highlighting the range of support options available to smokers and their families.

4.5 Receiving SHS Advice: Parents' Perspectives

Previous Advice

Follow-up interviews with parents and carers revealed that very few families in the sample had ever discussed secondhand smoke with a health professional either at Alder Hey or another healthcare setting before the research study. Although many families appeared to have some awareness of the risks of SHS exposure to children's health, this seemed to have been mainly derived from mass media marketing campaigns, such as the '7 steps' campaign (62), or via their children who had been taught key public health messages at school. This is of particular concern because several parents in the sample had children with a condition that could be directly attributable to, or exacerbated by, exposure to cigarette smoke. This would suggest that either the clinicians are delivering messages that are so brief that parents are unable to recall them or that parents have not received guidance on how best to protect the child from the risks of SHS from a healthcare professional. The families who said that they had received advice from a healthcare professional in the past, typically had one or more young children (less than five years old) and had discussed the risks with their midwife and/or health visitor when the child was a baby. The data therefore indicate that clinician-led advice may currently only be targeted at parents of young babies and that families of older children may be 'missed' in the present system.

The Intervention

The data indicate that the majority of parents and carers who participated in this study felt that the intervention was a positive addition to the consultation and was of benefit to both parents and children. In the survey most families (88 per cent) agreed that a hospital appointment was an appropriate time to discuss the dangers of secondhand smoke with families. Most participants (89 percent) felt the clinician had taken enough time to explain the effects of SHS on children's health, which suggests that the intervention is about the right length, allowing parents and carers sufficient time to engage with and understand the topic without feeling they don't have the time to discuss other issues related to their child's health. The majority of participants (89 per cent) also thought the intervention should be delivered to

all parents, not just those who were smokers. Although there were some initial concerns that families may be reluctant to talk about SHS with their child's doctor/nurse, only five per cent of parents and carers who participated in the study indicated that they felt embarrassed when talking to their child's clinician. The majority of parents were happy with the intervention and believed it was an important message for clinicians to deliver. The following quote is illustrative of the comments parents and carers made during the follow-up interviews:

Can I ask how you felt about receiving information about passive smoking when you attended at a hospital appointment for your child?

Err it didn't bother me because obviously any kind of help anything that you can improve in children's health, you know, make somebody aware. I am somebody who is aware but the hospital team didn't know that so it's good to give that information because they can't judge, people think we all know about it so they have got to give that information to everyone so it doesn't bother me. The more educated people are about these things the better it is for everybody all round. (P1804C8)

However, it should be acknowledged that there were a very small number of parents and carers (one smoker and two non-smokers) who suggested that it may not be appropriate or beneficial to deliver a SHS intervention during a hospital appointment, as these parents described:

Can I ask how you felt about receiving information about passive smoking when you attended at a hospital appointment for your child?

I felt...umm..I mean it was fine but I felt that we were there for other things so I was more concerned with other things he had to say and I just wanted him to get that bit out of the way so I could talk about what I would consider more important things. (P2605C8)

Yes, it was ok but to be honest I don't really think it was an appropriate thing to talk about because I wanted to talk about my child's health not other issues ... I felt a little bit uncomfortable and it's not new information so it's not really worthwhile talking about it. (P0506C8)

These parents and carers suggest that the intervention may detract from the main purpose of the consultation which is to focus on a specific aspect of their child's health. However, as the intervention is designed to be brief it is unlikely to encroach significantly on the consultation and there is the potential it will have relevance to the child's general health and well-being, even when the child presents with a condition which is not directly attributable to SHS

exposure. There is thus value in reminding families of the harmful effects of SHS exposure on all children's health.

It was interesting to note that a number of parents who were non-smokers expressed concern that smokers could potentially feel awkward and embarrassed discussing this issue, as the following comments indicate:

Can I ask you how you felt about discussing passive smoking with your child's doctor?

I didn't mind but then I don't smoke so .. I expect those who do [smoke] might not feel quite as happy about it. (P1210C1)

I felt fine because obviously I don't smoke and I'm ex-smoker as well, but I don't know how I'd feel if I smoked. I think I'd probably feel very differently. I'd like to think I'd feel embarrassed and I'd change if we were discussing it. I think it's a good area to address isn't it? (P1902C3)

However, the data suggest that although smokers may feel somewhat embarrassed about the fact they smoked, many welcomed the opportunity to discuss ways to modify their behaviour with a clinician. Indeed, several found the intervention a useful reminder that helped them to contemplate making a change, as these parents explain:

I honestly didn't mind, if anything is sort of brings it home. I was embarrassed .. well not embarrassed about the doctor asking me because it was fine to talk about but I was embarrassed about my smoking if you know what I mean. I was aware of the dangers even when the children were little but this just brings it out in the open...if anything I probably listened more because it was the doctor speaking. (P2607C2)

It didn't really bother me because it wasn't something that I'd kept from my kids do you know what I mean? My kids knew that I was a smoker. If it was different, say I was an alcoholic and the kids were in bed and they didn't know that I took a drink, I might have been a bit peeved with that, but no it didn't bother me. I'm glad really because I think it's the embarrassment. Because if you've got one like my little one, he never shuts up. So he's constantly in your ear, like if you go out for a ciggie he goes 'Why didn't you listen to what the telly, didn't you see that man's lungs?' and you go 'Oh shut up, give me some peace'. But yes, I'm glad. (P1702C6)

Both of the parents in this example went on to modify their smoking behaviour (one quit smoking and the other stopped smoking in the car) which suggests that there is scope for a clinician to shape parents attitudes towards SHS exposure.

It is important to acknowledge, as these quotes illustrate, that the clinician is not the only source of information about the risks of smoking and/or secondhand smoke, and that children may play a vital role in relaying key messages to parents. However, it is also worth noting that a clinician-led intervention may facilitate an open and honest discussion between children and their parents about the risks of smoking. One parent, whose child's nurse has taken part in a documentary about passive smoking and children's health, suggested that children may welcome the opportunity for a clinician to reiterate key smoking messages to parents, as this may reinforce the risks of smoking and help modify parents' behaviour:

Can I ask you how you felt about discussing passive smoking with your child's nurse?

That didn't worry me because I've known her for such a long time if you know what I mean and I'd also seen it on the telly. On the Alder Hey documentary and I thought 'Oh my God, we're getting ribbed by [child's nurse]' and the funny thing was ... the funny, funny thing was ... that's just come to my head, my youngest son...he went to me 'How come she's never said none of those things to you?'

Really?

Yes and I went 'Well I don't know' and he went 'Well when I next go up there I'm going to tell her to talk to you like that' and I went 'You just keep your mouth shut'. That's exactly what happened and, the next time we went up, I was given the leaflets and the books and I can remember him sitting in the little children's chair, smiling and I was going 'I know all your answers, not to smoke round them; if I smoke in the room it lingers for 6-8 hours; all this, that and the other and so she said 'Does your mum go outside and smoke' and all he said was 'yes'...And he was delighted.
(P2607C6)

Other parents, both smokers and non-smokers, also suggested the child, as well as the parent, could benefit from a discussion about secondhand smoke with a clinician, as children may be more likely to pay attention to advice delivered by a health professional as this mother explains:

Can I ask you how you felt about discussing passive smoking with your child's Doctor?

Oh it was very helpful, like I said erm because I think it's better for when the child is actually there with youyou know, and listening to other people like a Doctor who is giving him advice and that. Like I say I have touched lucky at the moment because I have got like 3 children...[and]...none of them have ever smoked and they don't even like the smell of it...So I think I have got no worries, like I said I have got no worries on that score but I think it was helpful that the child was actually

in as the Doctor was talking about it because they also listened to what the Doctor said about passing the information on. They take it in better from like someone senior. (P2507C9)

The clinician occupies a position of authority and expertise in the eyes of the patient and may potentially have more influence over a child's attitudes towards smoking than a parent. A number of parents who were smokers at the time of the intervention indicated that they felt hypocritical telling their children not to smoke and were concerned that their children would not listen to their advice, as they did not practice what they preached. A clinician-led intervention may therefore also support parents in their efforts to educate their children about the risks of smoking and secondhand smoke exposure, and have the additional advantage of preventing children and young people from starting smoking in the future.

4.6 Empowering Parents

Although a number of parents and carers reported a change in their own or others smoking behaviours following the intervention, the data suggest that achieving a sustained reduction in children's exposure to SHS is not always a straightforward and linear process. While parents and carers who smoke are able to actively choose to move their smoking outdoors or to quit smoking if they so wish, parents may have limited capacity to shape the attitudes and behaviours of other family members or friends who smoke and pose a risk to their child. One mother, for example, had asked her partner to stop smoking in front of her son but at the time of the follow-up interview he had returned to smoking inside the house, as the following conversation illustrates:

So can I ask you if you have made any changes at all since you spoke to the Nurse last November?

To be honest it's not me that smokes it's my husband, he did stop but he's wormed his way back in again, slowly.

Okay. So did you speak to your partner then about his smoking?

Yes definitely I am always on at him over it...

Can you remember what you said?

You have got to stop smoking...and it's your fault Anthony has got breathing problems.

And how did he respond to that?

Erm not, he has carried on smoking so not that good really.

Okay did he cut down or did he change where he smokes?

No he tried to cut down, he wanted to stop but erm he hasn't set his date yet, I don't know. (P0305C6)

In this particular instance the mother felt unable to enforce a smoking ban in the home and was uncertain how best to proceed with this situation. A number of clinicians suggested that unequal power relationships in the home may limit a mother's capacity to modify her (ex)partner's smoking behaviour, which will have implications for the health of the child. One clinician, discussing an intervention she had delivered to a family where the father smoked in front of his children, suggested that the father would not be swayed by the mother's views or the clinical evidence:

...I think he'd made his decision that he was smoking, he obviously ignored any of the advice that's given about smoking around children or around anyone and he was quite happy and I think, I don't think he would ever change, he did take the information from us but I'm not sure you could ever change his behaviour because I think that's who he is ... he was very, very like calm and kind of matter of fact but he was quite polite and the mum was like 'Yes he smokes all the time and I can't stop him and I really wish I could', so mum was really wanting him to change his behaviour and I don't know I mean maybe I don't know if we can follow him up, he might of!

How did he respond to his partner when she said 'Oh he smokes all the time'?

He didn't really say much and I think I don't know, I got the feeling that he wears the trousers in that family so I don't think it really matters what mum thinks. Really do you know, he's the man! (C4)

Here the nurse suggests that despite the mother's best intentions, there are limitations to what can be achieved in the context of a clinical appointment.

The data also suggest that parents may feel uncomfortable asking visitors not to smoke in their home or imposing smokefree rules in another person's house. For example, one mother had imposed a strict no smoking policy in her own home but felt unable to monitor whether her children's father, whom she no longer lived with, was still smoking in front of her daughters:

I passed the [secondhand smoke] information onto [their] dad because they were smoking in the kitchen with the girls and I wouldn't allow that here anyway, they're not allowed..whether [the children's father and his girlfriend] listen or not, because I don't go there, is a different story because he started getting them to have a bath at his mum's before they came home because I'm like if they smell of smoke I go mad. (P1702C4)

Another parent spoke about feeling powerless to influence her mother's smoking behaviour, despite the fact she had raised the issue repeatedly for many years:

[The clinician] asked, 'Do we smoke?' I said 'No' because neither my husband do or anyone else in the household, so she said 'Is she ever around anyone else who smokes?' So I said her grandmother smokes and she does go to her house a couple of times a week and she said to me 'Well, you do know that it's not good for her to be around smokers' and I said 'Yes, but sometimes it's unavoidable'. My mum doesn't smoke in the same room as her. Oh and that's what she said, she said 'Even if it's not in the same room, she still shouldn't be ... it's still not good for her to be in a house where somebody is smoking, which I know, but sometimes there's not much I can do... I've already spoken to her about it before and that's fine because she doesn't smoke in the same room as her. So I have spoken to her about it, since she was little she's never smoked in front of her so I don't know what else I could do really because she's not going to give up smoking now and we can't not go and see her. Do you see what I mean? (P0304C6)

Thus, it is important to acknowledge that parents may encounter difficulties in implementing a smokefree strategy, even if they do wish to maintain a smokefree environment for their child. However, clinicians can play a fundamental role in empowering families to protect their children by giving parents and carers, as well as children, the confidence to challenge those who smoke around them, as this clinician explained:

There were several patients where they had contact with second hand smoking in other people's home, usually relatives and a number of those did find that quite difficult to know how they could make any change to that, which I can understand and then there were others that where you know other people's homes they would smoke outside, you know there was ... but on the whole I think it was how do I tell someone in their own home you know where they should smoke so we sort of obviously tried to empower them that it was appropriate to have that conversation. (C8)

If clinicians recognise the challenges that parents may encounter when trying to create smokefree environments for their children, they will be in a better position to offer families appropriate advice and ongoing support to help them achieve this goal. Furthermore, it is also essential that clinicians revisit this issue on regular basis to reiterate the importance of keeping children away from secondhand smoke and remind parents of the need to continue challenging those who smoke in front of their child(ren).

It was noted that there was no literature in Alder Hey which dealt specifically with the problem of preventing children's SHS exposure in other people's homes and cars. There is thus potential to develop literature which offers guidance on this issue. Several participants requested literature to take away to give to grandparents to reinforce the importance of not smoking around their child. At the same time, it is also important not to underestimate the

influence that advice from a clinician may have on the smoking behaviours of grandparents (or other relatives) around children. A parent/carer may be able to use a leaflet as an opening to discuss grandparents smoking behaviour and then use this as an opportunity to reiterate the clinician's message. Moreover, a message from the clinician may potentially carry more weight than the parent voicing their concerns.

4.7 Providing an On-Site Smoking Cessation Advisor

Over the course of the first two weeks of the research period six people approached the FagEnds Smoking Advisor who was located in the clinics. One person was a smoker and requested some information on smoking cessation, two others requested information to take home to their partner and the remainder asked for leaflets to give to grandparents. Due to the lack of interaction with parents/carers of patients attending the clinics, over the two week period it seemed unfeasible to continue offering on-site specialist smoking support. Consequently, during week three and four clinicians gave each parent and carer a SHS leaflet(s) to take away from the consultation. The leaflet stated the main risks of SHS to children's health and included advice on ways to create and maintain a smokefree environment. The leaflet also included the contact details for FagEnds so families could access further information and support if they wished.

There are a number of reasons why parents/carers may have chosen not to approach the advisor. Firstly, the advisor was often sat in the waiting area of the clinic because there were usually no free rooms available for them to use as a 'consultation' room. This made it easy for parents and carers to find the advisor but it also meant that any discussions about smoking were conducted in a public place in the presence of other parents. This environment is unlikely to be conducive for disclosing personal and potentially embarrassing information, especially as parents may have felt embarrassed talking about their smoking behaviour in front of other families. Parents may therefore have chosen not to approach the advisor because they did not want to discuss their concerns publically. It is also important to acknowledge that parents and carers may not have felt comfortable discussing their concerns in front of their child or felt unable to do so because they were with a young child who did not want to stay in the clinic waiting room.

Secondly, while some parents may have felt comfortable revealing their concerns about SHS to the clinician, they may have been concerned about discussing their child's exposure to SHS with the FagEnds advisor. FagEnds are mainly associated with smoking cessation and

parents may have been concerned that the advisor was primarily interested in getting them to quit. At the same time, it is also worth considering that FagEnds are a Liverpool based smoking service. Therefore, parents from outside the area may not be familiar with the service and be unsure about what it is able to offer them. It may have been more appropriate to direct parents and carers from outside the Liverpool area to a different smoking advice service.

Thirdly, families may not have the time to speak to a smoking advisor following their consultation. Many parents and carers were in a rush to return to work and/or get their child to school or they had another appointment to attend elsewhere in the hospital. Finally, It may also have been the case that parents and carers didn't require further information as the data indicate that many families were already aware of the dangers of SHS and how to avoid children's exposure to SHS (the questionnaire data indicate this may be the case). Although parents may find it useful to be able to take a leaflet to give to their partner or other family members to reinforce the dangers of SHS to children's health, they do not need to speak to the advisor to achieve this and may be happy collecting leaflets from the clinician or waiting area instead.

Consequently, the data indicate that it is unfeasible to provide a specialist smoking advisor in out-patient clinic waiting areas to support the delivery of this intervention. We acknowledge that this service may be suitable in a different organisation or environment but it appears to be unsuitable for out-patient clinics in Alder Hey. We are, however, keen to explore ways in which the smoking advisors roles could be incorporated in other ways. It may be possible for clinicians to pass parents or carers' details, with their permission, to a smoking advice service, who can then telephone the family to provide telephone support. This issue will need to be addressed in any future study.

4.8 Barriers to Delivering SHS Advice

Although the participating clinicians were enthusiastic about the research they did raise concerns about the feasibility of delivering the intervention on a routine basis in their out-patient clinics. Clinicians were clearly under considerable time pressures due to full or overbooked clinics and because they had many issues to discuss with families in a relatively short consultation (the average consultation was 20 minutes long). Clinicians expressed concern that even a short intervention which lasted 2 or 3 minutes could have a detrimental impact on their waiting lists, as this clinician explained:

If you've put what even may have only been 1 or 2 minutes into every consultation, and my clinics are usually overbooked by 2 or 3, so you're trying to run faster and that means you make short cuts during your consultations, now if you're having to put in an extra message at the same time you might be taking something out which you'd like to have there you need to balance that off. So within the current template depends on how you're running, but I certainly tend to run my clinics here over full and that means I'm usually buying back time. So this is the kind of thing which comes out if you're buying the time back. (C1)

There is thus the concern that clinicians will only raise the issue of SHS exposure in cases where they suspect this is relevant to the child's condition because they cannot commit several minutes of their consultation to address this issue with each family. However, another clinician suggested that the reluctance to raise the issue of SHS with parents and carers may be also be attributed to a general unwillingness to challenge parents' lifestyles during a consultation, as this comment illustrates:

I think...we're too scared to actually confront people and I think we should be really more because we're health professionals it's kind of our job, it's not all about being nice.(C4)

The reality is that secondhand smoke exposure is a preventable cause of childhood morbidity and a significant number of children continue to be exposed to SHS smoke in private settings which places considerable strain on NHS services. As these findings indicate, it is not always immediately obvious who is affected by SHS exposure. It is therefore imperative that this issue is raised with every family at some point so that all families and carers can be offered the advice and support they need to protect their child from SHS.

One clinician suggested it may be best to raise this issue with new parents while taking the family history as it would be possible to deliver advice about SHS as part of a discussion about family lifestyles and general health. Another suggested that SHS information could be delivered as part of an annual review of a patient's progress, as delivering the same advice to a patient that may attend the hospital every few weeks would become tedious and repetitive for the clinician and the family. This issue warrants further exploration so that SHS is addressed on a regular basis with patients but does not overburden the clinician unnecessarily.

A number of clinicians were also concerned about delivering SHS messages in every consultation because they were uncertain how they would steer the conversation around to

this issue during routine practice, or whether this would detract from the main message that they wanted to impart to families, as these comments illustrate:

It was fine actually, no it was fine. I think the only thing that I would say is, because of the way our clinics run, sometimes it felt a little bit of an add-on at the end; because we didn't really have ... there was nothing that would make us think ... there wasn't a natural break in the clinic that you could think, now I can talk about smoking. So often, it was either while I was examining a child or at the end of clinic of 'Can I just ask you about type things'. So it did feel a little bit like an add on rather than a routine part of the clinic process ... but aside from that, I think the conversation was straight forward. I think parents were very receptive to it. (C1)

To be honest because this was a research study it meant that you already had the permission to raise it and therefore you could say 'As you realise we are doing a research study and within this we've asked if we can ask these questions or talk to you about smoking' so because of that it gave us a window to enter it in. If you didn't have that window you would have to find the appropriate space to put it in and that wouldn't always naturally come up and if it doesn't come up naturally and you force it in it becomes forced. If it's the last thing you say to patients as they are leaving the room then, given that patients recall what they first hear and what they hear from a doctor, they may miss out on the real message which you want them to take away. (C2)

However, it is reasonable to assume that until clinicians have acquired some experience of delivering SHS messages during consultations, it is possible that this intervention may feel unfamiliar and awkward as it will not be a routine part of practice. It may be worth investing the time to find the most suitable point to raise this issue so that it can be integrated effectively in the consultation.

Clinicians also suggested that there were occasion when it would be inappropriate to discuss SHS with families. If parents were attending an appointment for a new diagnosis for their child's condition or they were noticeably worried and concerned about their child's health, then clinicians indicated that they would not deliver the intervention as they did not want to overburden the parent, as these clinicians explain:

No I think if they're coming for a new diagnosis, they're going to either be...you'll be talking to them about smoking and they're going to be on a guilt trip, they feel bad as enough as it is because no matter what you say to them, they think they've done something and I think if it's the poor mum who's smoked then there's a blame issue there and that can get really worse. (C5)

...if the parent seems very stressful and anxious then you know I might leave it to the next time and obviously if she comes in with certain, or she's very stressful or upset

etc, then it's not the time to do it. They wouldn't be in the frame of mind to give up anyway. (C6)

It was evident that clinicians were keen to avoid stigmatising parents and carers or to imply that parents were to blame for their child's condition. Rather, clinicians sought to support and encourage parents to make appropriate behaviour change and recognised that there were occasions when this would not be feasible. Clinicians therefore suggested that it would be suitable to discuss SHS exposure with the family at another consultation where the parent or carer was less anxious and would be in a better position to engage with the intervention.

Finally, one clinician suggested that they would be unwilling to deliver the intervention to a parent or carer attending an appointment with a child that was capable of participating in the discussion, as this clinician explained:

Earlier on a child came for a post op review and she was 7 and her mum had obviously just had a fag because I could smell it on her, I would not have challenged her in front of the child because no 7 year old needs to know that the mum's doing something that people think is wrong. You know so I mean mum had got someone with her, I could have taken mum aside, but that's the other thing as well, if there's no one to look after the child then I think it's inappropriate to talk in front of a child about something like that...yes I wouldn't want to speak in front of a child sort of 4 and above really. (C4)

Yet, as indicated earlier in this report, discussions with parents and carers suggested that parents welcomed the opportunity for their children to receive additional information and advice about the risks of smoking and secondhand smoke. It is therefore possible for clinicians to address smoking and SHS exposure in a way that does not undermine or stigmatise the parents but supports them to protect their children from both exposure to SHS and from starting smoking in the future.

4.9 Lessons Learned from this Research Design

This research was set up so that parents were informed about the study by a letter sent out a week before their appointment. In order to do this it was necessary to work closely with the IT and medical records department to ensure that letters were sent to all parents attending a specific clinic in sufficient time for the parent to read the information before the appointment. It was then necessary to review patient lists the morning of the clinic to check whether any appointments had been cancelled or any new appointments added, so that the right parents were approached to take part in the study. At times, several clinics would run at the same time in the same clinic area, so it was necessary to continually review patient lists throughout

the session to maintain an accurate record of which parents had been approached so as not to miss any potential participants. It was also important to maintain an up to date record of the research numbers each participating parent and carer had been assigned so that it was possible to trace the research documents for each family.

Prior to telephoning parents and carers to conduct the follow-up interview, Denise Hinton reviewed the patient's medical record to ensure that it was an appropriate time to contact the child's family. If a patient had been admitted to a ward or had died then the family would not have been contacted again to avoid causing any unnecessary distress to the parents and carers. To facilitate this process it would have been helpful if the child's date of birth and unique Alder Hey number had been recorded on the consent sheet, as this would have made it easier to trace the child's record. It is worth emphasising that a child's medical record may contain different contact details than provided by the parent or carer because the child may reside at a different address so it is not always possible to check that the contact details that the parent and carer have provided have changed since the start of the study. Furthermore, the person who accompanied the child to the appointment may not be a parent or carer.

A number of parents and carers could not be contacted for the follow up interviews because their telephone number had either changed or was disconnected. It was also difficult to find an appropriate time to talk to parents and carers who had young children and/or were working full time. The majority of follow-up interviews with parents and carers were conducted in the evening when parents and carers were at home and the children had gone to bed. As indicated earlier in this report, it was also difficult to recruit parents to take part in a further longer telephone interview. It was therefore easier to adapt the first interview so that parents' responses could be explored in more detail.

5. CONCLUDING COMMENTS

5.1. Scale of SHS Exposure

The data indicate that over a fifth (22 per cent) of the parents and carers who took part in this research have a child(ren) who is exposed to SHS in enclosed home settings. As this figure is likely to underestimate the true level of children's exposure to SHS in the sample, these findings highlight the importance of delivering a SHS intervention to families who attend Alder Hey Children's Hospital. SHS exposure is a preventable cause of childhood morbidity and the delivery of a clinician-led intervention has the potential to encourage families to create smoke-free environments for their child, which will lead to improvements in child health.

A number of children in the sample were exposed to SHS outside the parental home. At present, clinicians typically only deliver information and advice to parents whom they suspect are smokers. Current interventions which focus only on parental smoking will only go so far in protecting *all* children from the negative effects of SHS. It is therefore important to deliver an intervention which addresses the issue of SHS exposure in other private settings beyond the immediate family home. It is particularly important to acknowledge parents' reliance on informal care for their child (such as grandparents) which would not be regulated in the same way that a nursery or childminder would be. It is likely that a number of children in the sample either visit or are cared for by grandparents or other family members who smoke, on a regular basis, and as such these children may be exposed to high levels of SHS. The findings suggest that it is possible that clinicians can offer parents and carers the support they need to create a smokefree environment in their own home and car as well as challenge other people who smoke near their children.

5.2 Feasibility

This research suggests that it is feasible for clinicians to deliver an intervention on second-hand smoke to parents during routine out-patient appointments. Clinicians were able to accommodate the intervention during their clinics and, when all parents and carers consented to participate, it was possible to deliver the intervention during every consultation in a clinic template. Although clinicians expressed concern about the length of time the intervention may add to each consultation and their overall clinic template, in reality the intervention was designed to be brief and on most occasions lasted only a few minutes. Where parents and carers indicated that their child was not exposed to SHS, clinicians reported the intervention

being as short as 30 seconds. The findings suggest that providing families with relevant literature may facilitate the delivery of the intervention by highlighting the main risks and providing families with appropriate advice to create and maintain smokefree environments for their children.

5.3 Acceptability

The data indicate that clinicians and the majority of parents and carers thought that SHS was an appropriate topic to discuss during an appointment at a children's hospital. Follow up interviews with parents and carers suggest they found the intervention helpful and informative and were able to recall the advice they had been given three months later. Interestingly, the findings indicate that parents and carers were willing to discuss their smoking behaviours and their child's exposure to SHS openly and honestly with clinicians during out-patient appointments. Although clinicians did initially express concerns about parents' reactions to questions about their lifestyle, these fears proved to be unfounded as several parents and carers disclosed their smoking status without being directly asked about smoking in the household. Moreover, no parent or carer reported feeling offended or embarrassed when discussing secondhand smoke with their child's clinician.

6 RECOMMENDATIONS

- As parents and carers are receptive to a clinician-led intervention designed to reduce children's exposure to SHS, and there is evidence to suggest that the intervention may initiate attitudinal and behaviour change, clinicians should routinely deliver a brief SHS intervention to all parents and carers attending out-patient appointments at Alder Hey Children's NHS Foundation Trust.
- As many children are exposed to SHS in other people's homes, and it is not always evident whether a parent is a smoker, clinicians should deliver information and advice to **ALL** parents and carers of patients attending out-patient appointments.
- Children's exposure to SHS should be recorded by the clinician in the patient's medical record and reviewed on a regular basis, so that parents and carers are reminded of the main risks to children's health and this may act as an opener for a follow-up intervention to offer additional advice and support as appropriate.
- The findings suggest that leaflets facilitate the delivery of the SHS intervention. While general messages are appropriate, the research suggests that clinicians also need access to information and leaflets which empower parents to deal with a range of situations, such as challenging smoking in another person's home or creating a smoke-free environment in a lone-parent household, where parents may find it more difficult to go outside to smoke.
- A large number of families who attend Alder Hey Children's Hospital are from outside the Liverpool area. Families need to be directed towards appropriate NHS Stop Smoking Services for further information and advice about creating smokefree environments and/or smoking cessation.
- Any future study needs to include robust objective measures of children's exposure to SHS, to measure changes in baseline and post-intervention exposure and to calculate the effectiveness of the intervention.

REFERENCES

1. Liverpool Smoking Prevalence Survey (2011) Report in Preparation.
2. Green E, Courage C, Rushton L. Reducing domestic exposure to environmental tobacco smoke: a review of attitudes and behaviours. *The Journal of the Royal Society for the Promotion of Health*. 2003 March 1, 2003;123(1):46-51.
3. Department of Health. *Healthy Lives, Health People: A Tobacco Control Plan for England*. London: Department of Health; 2011.
4. Royal College of Physicians. *Passive Smoking and Children: A report of the Tobacco Advisory Group of the Royal College of Physicians*. London: Royal College of Physicians; 2010.
5. Akhtar PC, Haw SJ, Currie DB, Zachary R, Currie CE. Smoking restrictions in the home and secondhand smoke exposure among primary schoolchildren before and after introduction of the Scottish smoke-free legislation. *Tobacco Control*. 2009 October 1, 2009;18(5):409-15.
6. Akhtar PC, Currie DB, Currie CE, Haw SJ. Changes in child exposure to environmental tobacco smoke (CHETS) study after implementation of smoke-free legislation in Scotland: national cross sectional survey. *BMJ*. 2007 September 15, 2007;335(7619):545.
7. Jarvis MJ, Goddard E, Higgins V, Feyerabend C, Bryant A, Cook DG. Children's exposure to passive smoking in England since the 1980s: cotinine evidence from population surveys. *BMJ*. 2000 August 5, 2000;321(7257):343-5.
8. Matt GE, Quintana PJE, Hovell MF, Bernert JT, Song S, Novianti N, et al. Households contaminated by environmental tobacco smoke: sources of infant exposures. *Tobacco Control*. 2004 March 1, 2004;13(1):29-37.
9. King K, Martynenko M, Bergman MH, Liu YH, Winickoff JP, Weitzman M. Family composition and children's exposure to adult smokers in their homes. *Pediatrics*. 2009;123(4).
10. Sims M, Tomkins S, Judge K, Taylor G, Jarvis MJ, Gilmore A. Trends in and predictors of second-hand smoke exposure indexed by cotinine in children in England from 1996 to 2006. *Addiction*. 2010;105(3):543-53.
11. Bolte G, Fromme H. Socioeconomic determinants of children's environmental tobacco smoke exposure and family's home smoking policy. *European Journal of Public Health*. 2009;19(1):52-8.
12. Graham H, Inskip HM, Francis B, Harman J. Pathways of disadvantage and smoking careers: evidence and policy implications. *Journal of Epidemiology and Community Health*. 2006 September 1, 2006;60(suppl 2):ii7-ii12.
13. Jarvis MJ, Wardle J. Social patterning of individual health behaviours: the case of cigarette smoking. In: Marmot M, editor. *Social Determinants of Health*. Oxford: Oxford University Press; 1999.
14. Marsh A, McKay S. *Poor Smokers*. London: Policy Studies Institute; 1994.
15. Ferrence R, Ashley MJ. Protecting children from passive smoking. *BMJ*. 2000 August 5, 2000;321(7257):310-1.
16. Strachan DP, Cook DG. Parental smoking and childhood asthma: longitudinal and case-control studies. *Thorax*. 1998 March 1, 1998;53:204-12.
17. ASH. *Passive Smoking: A Summary of the Evidence*. Archives of Pediatric Medicine. 2004.
18. Best D, Binns HJ, Forman JA, Karr CJ, Paulson JA, Osterhoudt KC, et al. Technical report - Secondhand and prenatal tobacco smoke exposure. *Pediatrics*. 2009;124(5).

19. Fleming P, Blair PS. Sudden Infant Death Syndrome and parental smoking. *Early Human Development*. [doi: DOI: 10.1016/j.earlhumdev.2007.07.011]. 2007;83(11):721-5.
20. Golding J. Sudden infant death syndrome and parental smoking; a literature review. *Paediatric and Perinatal Epidemiology*. 1997;11(1):67-77.
21. Sari H-M, Harri S, Jussi T, Petri SM. Passive smoking after tympanostomy and risk of recurrent acute otitis media. *International journal of pediatric otorhinolaryngology*. 2007;71(8):1305-10.
22. Adair-Bischoff CE, Sauve RS. Environmental Tobacco Smoke and Middle Ear Disease in Preschool-Age Children. *Arch Pediatr Adolesc Med*. 1998 February 1, 1998;152(2):127-33.
23. Strachan DP, Cook DG. Health effects of passive smoking. 4. Parental smoking, middle ear disease and adenotonsillectomy in children. *Thorax*. 1998 January 1, 1998;;53::50-6.
24. Cook DG, Strachan DP. Summary of effects of parental smoking on the respiratory health of children and implications for research. *Thorax*. 1999 April 1, 1999;;54::357-66.
25. Gerald LB, Gerald JK, Gibson L, Patel K, Zhang S, McClure LA. Changes in environmental tobacco smoke exposure and asthma morbidity among urban school children. *Chest*. 2009;135(4):911-6.
26. Mannino DM, Homa DM, Redd SC. Involuntary Smoking and Asthma Severity in Children*. *Chest*. 2002 August 1, 2002;122(2):409-15.
27. Cook DG, Strachan DP. Health effects of passive smoking. 3. Parental smoking and prevalence of respiratory symptoms and asthma in school age children. *Thorax*. 1997;52(12):1081-94.
28. Quirk JT. Cigarette-related injuries to young children in the USA, 2002-2007. *Public Health*. [doi: DOI: 10.1016/j.puhe.2009.07.004]. 2009;123(9):628-9.
29. Squires T, Busutil A. Can child fatalities in house fires be prevented? *Injury Prevention*. 1996 June 1, 1996;2(2):109-13.
30. Mannino DM, Moorman JE, Kingsley B, Rose D, Repace J. Health Effects Related to Environmental Tobacco Smoke Exposure in Children in the United States: Data From the Third National Health and Nutrition Examination Survey. *Arch Pediatr Adolesc Med*. 2001 January 1, 2001;155(1):36-41.
31. Gilliland FD, Berhane K, Islam T, Wenten M, Rappaport E, Avol E, et al. Environmental Tobacco Smoke and Absenteeism Related to Respiratory Illness in Schoolchildren. *American Journal of Epidemiology*. 2003 May 15, 2003;157(10):861-9.
32. Sargent JD, Dalton M. Does Parental Disapproval of Smoking Prevent Adolescents From Becoming Established Smokers? *Pediatrics*. 2001 December 1, 2001;108(6):1256-62.
33. Winickoff JP, McMillen RC, Carroll BC, Klein JD, Rigotti NA, Tanski SE, et al. Addressing Parental Smoking in Pediatrics and Family Practice: A National Survey of Parents. *Pediatrics*. 2003 November 1, 2003;112(5):1146-51.
34. Moss D, Cluss PA, Mesiano M, Kip KE. Accessing Adult Smokers in the Pediatric Setting: What Do Parents Think? *Nicotine & Tobacco Research*. 2006 February 1, 2006;8(1):67-75.
35. Frankowski BL, Secker-Walker RH. Advising Parents to Stop Smoking: Opportunities and Barriers in Pediatric Practice. *Am J Dis Child*. 1989 September 1, 1989;143(9):1091-4.
36. Cluss PA, Moss D. Parent Attitudes About Pediatricians Addressing Parental Smoking. *Ambulatory Pediatrics*. [doi: DOI: 10.1367/1539-4409(2002)002<0485:PAAPAP>2.0.CO;2]. 2(6):485-8.

37. Emmons KM, Hammond SK, Fava JL, Velicer WF, Evans JL, Monroe AD. A Randomized Trial to Reduce Passive Smoke Exposure in Low-Income Households With Young Children. *Pediatrics*. 2001 July 1, 2001;108(1):18-24.
38. Hovell MF, Zakarian JM, Matt GE, Liles S, Jones JA, Hofstetter CR, et al. Counseling to reduce children's secondhand smoke exposure and help parents quit smoking: A controlled trial. *Nicotine and Tobacco Research*. 2009;11(12):1383-94.
39. Hovell MF, Zakarian JM, Matt GE, Hofstetter CR, Bernert JT, Pirkle J. Effect of counselling mothers on their children's exposure to environmental tobacco smoke: randomised controlled trial. *BMJ*. 2000;321(7257):337-42.
40. Winickoff JP, Buckley VJ, Palfrey JS, Perrin JM, Rigotti NA. Intervention With Parental Smokers in an Outpatient Pediatric Clinic Using Counseling and Nicotine Replacement. *Pediatrics*. 2003 November 1, 2003;112(5):1127-33.
41. Winickoff JP, Hillis VJ, Palfrey JS, Perrin JM, Rigotti NA. A Smoking Cessation Intervention for Parents of Children Who Are Hospitalized for Respiratory Illness: The Stop Tobacco Outreach Program. *Pediatrics*. 2003 January 1, 2003;111(1):140-5.
42. Priest N, Roseby R, Waters E, Polnay A, Campbell R, Spencer N, et al. Family and carer smoking control programmes for reducing children's exposure to environmental tobacco smoke. *Cochrane database of systematic reviews (Online)*. 2008(4).
43. Field S. Don't take offence if we lecture you on how to stay alive and healthy. *Observer*. 2010 8th August 2010.
44. Bell K, McNaughton D, Salmon A. Medicine, morality and mothering: Public health discourses on foetal alcohol exposure, smoking around children and childhood overnutrition. *Critical Public Health*. 2009;19(2):155-70.
45. McKie L, Laurier E, Taylor RJ, Lennox AS. Eliciting the smoker's agenda: implications for policy and practice. *Social Science & Medicine*. [doi: DOI: 10.1016/S0277-9536(02)00009-6]. 2003;56(1):83-94.
46. Holdsworth C, Robinson JE. 'I've never ever let anyone hold the kids while they've got ciggies': moral tales of maternal smoking practices. *Sociology of Health & Illness*. 2008;30(7):1086-100.
47. Hopper JA, Craig KA. Environmental Tobacco Smoke Exposure Among Urban Children. *Pediatrics*. 2000;106(4):e47.
48. Hattery A. *Women, Work and Family: Balancing and Weaving*. London: Sage; 2001.
49. Wiltshire S, Bancroft A, Parry O, Amos A. 'I came back here and started smoking again': perceptions and experiences of quitting among disadvantaged smokers. *Health Education Research*. 2003 June 1, 2003;18(3):292-303.
50. Robinson J, Ritchie D, Amos A, Greaves L, Cunningham-Burley S. Volunteered, negotiated, enforced: family politics and the regulation of home smoking. *Sociology of Health and Illness*. 2011;33(1):66-80.
51. Robinson J, Kirkcaldy AJ. 'Imagine all that smoke in their lungs': parents' perceptions of young children's tolerance of tobacco smoke. *Health Education Research*. 2009 February 1, 2009;24(1):11-21.
52. Robinson J, Kirkcaldy AJ. []You think that I'm smoking and they're not': Why mothers still smoke in the home. *Social Science & Medicine*. [doi: DOI: 10.1016/j.socscimed.2007.03.048]. 2007;65(4):641-52.
53. Robinson J, Kirkcaldy AJ. Disadvantaged mothers, young children and smoking in the home: Mothers' use of space within their homes. *Health & Place*. [doi: DOI: 10.1016/j.healthplace.2007.03.001]. 2007;13(4):894-903.
54. Bottorff JL, Oliffe J, Kalaw C, Carey J, Mroz L. Men's constructions of smoking in the context of women's tobacco reduction during pregnancy and postpartum. *Social Science & Medicine*. [doi: DOI: 10.1016/j.socscimed.2005.11.058]. 2006;62(12):3096-108.

55. Bottorff JL, Radsma J, Kelly M, Oliffe JL. Fathers' narratives of reducing and quitting smoking. *Sociology of Health and Illness*. 2009;31(2):185-200.
56. Oliffe JL, Bottorff JL, Johnson JL, Kelly MT, Lebeau K. Fathers: Locating smoking and masculinity in the postpartum. *Qualitative Health Research*. 2010;20(3):330-9.
57. Greaves LJ, Hemsing NJ. Sex, Gender, and Secondhand Smoke Policies: Implications for Disadvantaged Women. *American journal of preventive medicine*. [doi: DOI: 10.1016/j.amepre.2009.05.012]. 2009;37(2, Supplement 1):S131-S7.
58. Lavery L, and Robinson, J. Brief Intervention Guide: Protecting Children from Secondhand Smoke. Liverpool: University of Liverpool prepared for Smoke Free North West; 2010.
59. Matthews B. *Research Methods: A Practical Guide for the Social Sciences*. Harlow: Longman; 2010.
60. Silverman D. *Doing Qualitative Research: A Practical Handbook*. London: SAGE; 2010.
61. Teddlie C, Tashakkori A. *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Behavioural Sciences*. London: SAGE; 2009.
62. Smokefree Northwest. Smokers Urged to 'Take 7 Steps out' to Protect Northwest Children. 2010 [cited 2011 May]; Available from: <http://www.smokefreenorthwest.org/take7stepsout-secondhand-smoke-children/>.
63. Gorber SC, Schofield-Hurwitz S, Hardt J, Levasseur G, Tremblay M. The accuracy of self-reported smoking: A systematic review of the relationship between self-reported and cotinine-assessed smoking status. *Nicotine Tobacco Research*. 2009;11(1):12-24.
64. Kalkbrenner AE, Hornung RW, Bernert JT, Hammond SK, Braun JM, Lanphear BP. Determinants of serum cotinine and hair cotinine as biomarkers of childhood secondhand smoke exposure. *J Expos Sci Environ Epidemiol*. 2010;20(7):615-24.
65. World Health Organisation (WHO). Report on the Global Tobacco Epidemic: Implementing smoke-free environments 2009.
66. Royal Liverpool Children's NHS. *Because Your Health Matters: A Public Health Strategy for Alder Hey*. Liverpool 2007.