COPYRIGHT AND CITATION CONSIDERATIONS FOR THIS THESIS/ DISSERTATION

- Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

- NonCommercial — You may not use the material for commercial purposes.

- ShareAlike — If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original.

How to cite this thesis

A COMPARISON OF THE EFFICACY OF AURICULAR ACUPUNCTURE AND HOMOEOPATHIC TREATMENT IN SMOKING CESSATION

A Research Report submitted to the Faculty of Health Sciences, Technikon Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Technology: Homoeopathy

By Glenn Ferguson

(Student number: 9530967)

Supervisor: Dr. F.P. Motz Date:

Promoter: Dr. S.M. Power Date:

Johannesburg, 2000
A COMPARISON OF THE EFFICACY OF AURICULAR ACUPUNCTURE AND HOMOEOPATHIC TREATMENT IN SMOKING CESSATION

A Research Report submitted to the Faculty of Health Sciences, Technikon Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Technology: Homoeopathy

By

Glenn Ferguson

(Student number: 9530967)

Supervisor: Dr. F.P. Motz Date: 
Promoter: Dr. S.M. Power Date: 10/01/2001

Johannesburg, 2000
DECLARATION

I declare that this research report is my own, unaided work. It is being submitted for the degree of Master of Technology at the Technikon Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other Technikon or University.

(Signature of Candidate)

____________________ Day of ____________________
ABSTRACT

The aim of this study was to compare the efficacy of homoeopathic hetero-isotherapeutic treatment to auricular acupuncture in smoking cessation.

The study was a clinical trial, in which the two different treatment forms were compared. The study required sixty participants. The participants were paired and randomly divided into two groups. The first group received homoeopathic treatment, whilst the second group received auricular acupuncture treatment. The study took place over a six-week period, in which each participant completed a one-week screening period before and after the four-week treatment period began.

During the initial consultation, participants were required to complete a questionnaire under the researcher’s supervision. The questionnaire included the Fagerstrom tolerance test to determine the participant’s dependence on nicotine. Each participant recorded a daily cigarette consumption log before, during and after treatment. Median values of the daily cigarette consumption were calculated and then statistically analysed.

Prior to treatment, no significant different in daily cigarette consumption was found between the two groups. Consequent to treatment, both the auricular acupuncture group and the homoeopathic hetero-isotherapeutic group were found to show a significant decrease in the number of cigarettes smoked.

At 6 weeks the cessation rate for the homoeopathic hetero-isotherapeutic group was 20%, and that of the auricular acupuncture group was 16.7%. Although there was no statistical difference between the two groups after treatment, the homoeopathic hetero-isotherapeutic treatment group showed a 3.3% improvement over the auricular acupuncture group.
From the results, it was apparent that both the auricular acupuncture treatment and the homoeopathic hetero-isotherapeutic treatment were effective in smoking cessation.
ACKNOWLEDGEMENTS

I would like to thank the following people for their help with this research project report:

Dr F.P. Motz for his invaluable support and guidance as supervisor, and willingness to pass on his vast knowledge in auricular acupuncture;

Dr S.M. Power, Faculty of Health and Biotechnology, for his patience as promoter, and all his help with the format and referencing;

Mr V. Micali, Senior advisor (Stats and OR) ESKOM Generation, for all his time and assistance with the statistical analysis and presentation of data;

The TWR Library staff, for their support in tracing references for this report;

And the staff of the School of Homoeopathy, TWR, Doornfontein for their prompt and willing assistance throughout the research.
# TABLE OF CONTENTS

DECLARATION........................................................................................................... II

ABSTRACT .................................................................................................................. III

ACKNOWLEDGEMENTS ............................................................................................... V

LIST OF TABLES ........................................................................................................ IX

LIST OF FIGURES ...................................................................................................... X

1 Chapter One – Introduction ...................................................................................... 1

2 Chapter Two – Review of the Related Literature.................................................... 4
   2.1 Cigarette consumption ......................................................................................... 4
   2.2 Historical perspective ......................................................................................... 5
   2.3 Addiction ............................................................................................................ 6
       2.3.1 Psychosocial approach to addiction: ............................................................ 6
       2.3.2 Pharmaceutical approach to addiction ......................................................... 7
   2.4 Nicotine Withdrawal .......................................................................................... 8
   2.5 Health risks of smoking .................................................................................... 9
       2.5.1 Cancer ....................................................................................................... 9
       2.5.2 Cardiovascular disease .............................................................................. 12
       2.5.3 Respiratory disease .................................................................................. 13
       2.5.4 Other health risks ..................................................................................... 14
   2.6 Health risks of environmental tobacco smoke ................................................. 17
       2.6.1 Constituents of Environmental Tobacco Smoke .......................................... 17
       2.6.2 Health risks in early childhood ................................................................... 19
       2.6.3 Health risks in adults ................................................................................ 20
   2.7 Negative effects of smoking cessation ............................................................... 20
       2.7.1 Major depression ....................................................................................... 20
       2.7.2 Ulcerative colitis ...................................................................................... 21
       2.7.3 Weight gain .............................................................................................. 21
       2.7.4 Alzheimer’s disease .................................................................................. 22
       2.7.5 Parkinson’s disease .................................................................................. 22
   2.8 Methods of smoking cessation .......................................................................... 22
       2.8.1 Nicotine replacement therapy ................................................................... 23
       2.8.2 Hypnosis .................................................................................................. 27
       2.8.3 Behavioural methods ................................................................................. 27
       2.8.4 Acupuncture ............................................................................................. 28
       2.8.5 Homoeopathy ......................................................................................... 32
Chapter 3 – Materials and Methods ................................................................. 35
  3.1 Study design .................................................................................. 35
  3.2 Subjects ......................................................................................... 36
  3.3 Intervention .................................................................................. 37
    3.3.1 Auricular Acupuncture treatment group .................................. 37
    3.3.2 Homoeopathic Hetero-Isotherapeutic treatment group .......... 38
  3.4 Measurement techniques .............................................................. 40
    3.4.1 Daily smoking log (Appendix 6) ............................................ 40
    3.4.2 Tolerance dependence questionnaires (Appendix 2) ........... 41
    3.4.3 Questionnaire on types of smokers (Appendix 3) ............... 41
  3.5 Statistics .................................................................................... 42

Chapter Four – The Results ...................................................................... 44
  4.1 Introduction .................................................................................. 44
  4.2 Daily smoking log (Appendix 6) .................................................. 44
  4.3 Tolerance dependence questionnaires (Appendix 2) ................. 50
  4.4 Questionnaires on Types of smokers (Appendix 3) ................. 51
    4.4.1 Habitual addictive .................................................................. 52
    4.4.2 Reduction of Negative affect ............................................... 53
    4.4.3 Positive affect ...................................................................... 54

Chapter Five – Discussion ..................................................................... 55
  5.1 Daily smoking log (Appendix 6) .................................................. 55
    5.1.1 Auricular Acupuncture treatment group ................................ 55
    5.1.2 Homoeopathic hetero-isotherapeutic group ....................... 56
    5.1.3 Factors affecting cessation – Comparison between the Auricular
        Acupuncture treatment group and the Homoeopathic hetero-isotherapeutic
        treatment group ....................................................................... 57

Chapter Six – Conclusion and Recommendations .................................. 63
  6.1 Conclusion .................................................................................. 63
  6.2 Recommendations ...................................................................... 64

LIST OF REFERENCES ............................................................................. 65

APPENDICES ......................................................................................... 77
  1 Appendix 1: Subjects informed consent form ............................. 77
  2 Appendix 2: Questionnaire on tolerance dependence ............... 78
  3 Appendix 3: Questionnaire on types of smokers ..................... 79
  4 Appendix 4: Smoking history ....................................................... 83
  5 Appendix 5: Coping with withdrawal ......................................... 85
  6 Appendix 6: Daily smoking log .................................................... 86
7 Appendix 7: Method 4a ................................................................. 87
8 Appendix 8: Homoeopathic hetero-isotherapeutic group: Raw data ..... 89
9 Appendix 9: Auricular acupuncture group: Raw data ....................... 90
LIST OF TABLES

Table 2.1 shows the prevalence of Tobacco smoking and the number of deaths attributed to cigarette smoking per annum. (HyperHealth, 1999) ........4

Table 2.2 Prevalence of Lung Cancer. (HyperHealth, 1999) ........................................9

Table 4.1 Subject characteristics on entry into the study ..............................................45

Table 4.2 Mean number of cigarettes smoked daily at the end of the 1-week trial period following the end of treatment ........................................................................46
LIST OF FIGURES

Figure 1  Illustrates auricular acupuncture points used for smoking cessation. (Oleson, 1995) ................................................................. 38

Figure 2  Comparison of the Daily cigarette consumption of the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic treatment group before and after treatment. .................. 47

Figure 3  Comparison of the Daily cigarette consumption of the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic treatment group for all 6 weeks of the study. ................. 49

Figure 4  Comparison of scores obtained in the Tolerance Dependence Questionnaire by subjects in the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic treatment group. .......... 51

Figure 5  Comparison of scores obtained in the Tolerance Dependence Questionnaire by subjects in the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic treatment group. .......... 52

Figure 6  Comparison of the scores obtained in the Reduction of Negative affect category by the subjects in the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic group. ...................... 53

Figure 7  Comparison of the scores obtained in the Positive affect category by the subjects in the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic group. ........................................... 54
Figure 8  Comparison between the mean daily number of cigarettes smoked in males and age of the male participant. .................................59

Figure 9  Comparison between the mean daily number of cigarettes smoked in females and age of the female participant.................................59

Figure 10  Comparison between the nicotine content of the cigarette and the participants for each group.........................................................61
CHAPTER ONE – INTRODUCTION

Of all people who die from smoking, half do so in middle age. Half the smokers who began when young will die from tobacco-related diseases. Currently there are three and a half million smoking-related deaths a year. This means that every ten seconds a person dies from the effects of tobacco use; this excludes all those whose deaths related to passive smoke exposure. By early next century this will have increased to ten million deaths per year and seven million of these will be in developing countries. (Heart foundation, 1999)

The latest study on the status of smoking in South Africa has revealed that one in three (seven million) adult South Africans smoke. Fifty-two percent of South African men and 17% of women smoke. The research showed that the provinces with the highest smoking rates were the Northern Cape (55%), Western Cape (48%) and North West Province (46%). (Heart foundation, 1999)

The coloured population group has the highest smoking rate nationally at 59%, reflecting an increase of 12% since 1992. Coloured men and women have the highest gender specific smoking rates of any other groups, 36% of Asians, 35% of whites and 31% of blacks smoke. Overall national smoking rates have increased by 3% since 1992. (Heart foundation, 1999)

According to a recent study women born in 2020 will have a life expectancy of ninety while men will probably die by the age of seventy-eight. This means that by 2020 the current six-year gap in the life expectancy will have increased to twelve years. The reason given for this is the increase in men who will die from tobacco-related diseases. It is predicted that tobacco will be a bigger factor than HIV in determining health in 2020. (Heart foundation, 1999)

Previous scientific research on smoking cessation has mainly been directed toward nicotine replacement techniques. Such techniques have included the
nicotine patch (Mendelsohn and Richmond, 1995), nicotine gum (Jamrozik, Fowler, Vessey, and Wald, 1984) and nicotine nasal spray (Sutherland, Stapleton, Russell, Jarvis, Hajek, Belcher, and Feyerabend, 1992). Most studies, however, have recognized the need for a multifactorial approach to smoking cessation, as tobacco addiction is a complex process involving the interplay of pharmacology, learned or conditioned factors, personality and social settings (Benowitz, 1992; Gordon, 1995; Simpson and Polson, 1995).

Nicotine replacement therapy provides constant protection from withdrawal symptoms and craving for cigarettes, while the patient focuses on changing behavioural aspects (Mendelsohn and Richmond, 1995). The nicotine in these preparations can, however, lead to dependence after the therapeutic period (Hughes et al., 1986). Nicotine preparations are not only costly (Howard and Hughes, 1995:214), but they are also contraindicated in many of the patients. Most patients are at risk from the continuation of smoking, such as pregnant women, mothers who are breastfeeding, and persons suffering from recent myocardial infarction or cerebrovascular accident, unstable angina and severe arrhythmia. Patients are also warned against their use if suffering from hypertension, coronary artery disease, peripheral vascular disease, peptic ulcer disease and diabetes mellitus (Simpson and Polson, 1995).

The use of homoeopathic remedies has been recorded in only one study (Labadie, Dones, Gachie, Freour, Perchoc and Huynh-Van-Thao, 1983), in which they were used as an adjunctive therapy to tranquillizers and acupuncture treatment. A study comparing acupuncture and homoeopathic treatment in the cessation of smoking (de la Rouviere, 1996), using one session of Traditional Chinese acupuncture and moxibustion, based on the ‘smoking formula’ of Lavier (1975:343), and a three month course of a homoeopathic hetero-isotherapy. This study concluded that homoeopathy was 7% more effective than Traditional Chinese acupuncture.

In light of the above, the aim of this study is to investigate the efficacy of homoeopathic hetero-isotherapeutic treatment in the cessation of smoking, and to
compare this with participants who receive auricular acupuncture treatment for the same reason.

Homoeopathic treatment can be readily combined with the behavioural methods of intervention, which are currently recommended (Gordon, 1995). Moreover, the treatment can be dispensed by the Homoeopathic physician as part of the overall health care programme of his patients.
2 CHAPTER TWO – REVIEW OF THE RELATED LITERATURE

2.1 CIGARETTE CONSUMPTION

Currently there are three and a half million smoking related deaths per year (Heart foundation, 1999). The prevalence of Tobacco smoking and the number of deaths attributed to cigarette smoking is shown in Table 2.1.

Table 2.1 The prevalence of Tobacco smoking and the number of deaths attributed to cigarette smoking per annum. (HyperHealth, 1999)

<table>
<thead>
<tr>
<th>Country</th>
<th>Annual Per Capita Cigarette Consumption</th>
<th>Number of Deaths Attributed to Smoking Per Annum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyprus:</td>
<td>4,050</td>
<td></td>
</tr>
<tr>
<td>Cuba:</td>
<td>3,920</td>
<td></td>
</tr>
<tr>
<td>Greece:</td>
<td>3,640</td>
<td></td>
</tr>
<tr>
<td>Poland:</td>
<td>3,300</td>
<td></td>
</tr>
<tr>
<td>Japan:</td>
<td>3,270</td>
<td>110,186</td>
</tr>
<tr>
<td>United States:</td>
<td>3,270</td>
<td>400,000</td>
</tr>
<tr>
<td>Canada:</td>
<td>3,180</td>
<td>30,000</td>
</tr>
<tr>
<td>Iceland:</td>
<td>3,100</td>
<td></td>
</tr>
<tr>
<td>Switzerland:</td>
<td>2,960</td>
<td>5,909</td>
</tr>
<tr>
<td>Spain:</td>
<td>2,740</td>
<td>20,230</td>
</tr>
<tr>
<td>Australia:</td>
<td>2,720</td>
<td>23,000</td>
</tr>
<tr>
<td>Austria:</td>
<td>2,560</td>
<td>8,881</td>
</tr>
<tr>
<td>Ireland:</td>
<td>2,560</td>
<td></td>
</tr>
<tr>
<td>Italy:</td>
<td>2,460</td>
<td></td>
</tr>
<tr>
<td>New Zealand:</td>
<td>2,510</td>
<td></td>
</tr>
<tr>
<td>France:</td>
<td>2,400</td>
<td>35,853</td>
</tr>
<tr>
<td>Germany:</td>
<td>2,360</td>
<td>76,005</td>
</tr>
<tr>
<td>Israel:</td>
<td>2,310</td>
<td></td>
</tr>
<tr>
<td>Soviet Union:</td>
<td>2,170</td>
<td></td>
</tr>
<tr>
<td>United Kingdom:</td>
<td>2,120</td>
<td>94,680</td>
</tr>
<tr>
<td>Denmark:</td>
<td>2,110</td>
<td>8,842</td>
</tr>
<tr>
<td>Belgium:</td>
<td>1,990</td>
<td>11,569</td>
</tr>
<tr>
<td>Turkey:</td>
<td>1,970</td>
<td></td>
</tr>
<tr>
<td>Norway:</td>
<td>1,920</td>
<td></td>
</tr>
<tr>
<td>Egypt:</td>
<td>1,920</td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>Number</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>1,730</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>1,720</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>1,690</td>
<td>16,032</td>
</tr>
<tr>
<td>Sweden</td>
<td>1,660</td>
<td>11,443</td>
</tr>
<tr>
<td>China</td>
<td>1,590</td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>1,550</td>
<td></td>
</tr>
<tr>
<td>Chile</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>Panama</td>
<td>850</td>
<td></td>
</tr>
<tr>
<td>Iran</td>
<td>620</td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>Ethiopia</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

### 2.2 HISTORICAL PERSPECTIVE

Many health problems have been linked to smoking. These include angina, arteriosclerosis, cataracts, chronic bronchitis, colon and rectal cancer, diarrhoea, emphysema, heartburn, high blood pressure, impotence, peptic ulcers, respiratory ailments, urinary incontinence, circulatory ailments and cancers of the mouth and throat (Balch and Balch, 1997). According to Yach (1995), tobacco use causes three million deaths per year, and it is estimated this figure will rise to ten million deaths per year in the 2020’s.

Tobacco related disease is a recent phenomenon, and although tobacco has been used for centuries within rituals of certain cultures, it has only become widespread following the production of cheap machine made cigarettes. (Yach, 1995)

Through successful marketing strategies during World War II, the popularity of smoking grew, and by the 1950’s and 1960’s the incidence of lung cancer had reached unprecedented levels among males of developed countries. The US Surgeon General released a report in 1964 that established a causal link between smoking and laryngeal cancer in males. Since 1964 the US Surgeon General has released 23 reports on smoking and its effects on health, the risks of environmental tobacco smoke, and the groups of smokers for special consideration. (Samet, 1992)
An immense amount of research has been conducted both for epidemiological evidence linking smoking and disease, and for the search for causative factors of illness within tobacco smoke (Yach, 1995). Most of this research has been spurred on by the Tobacco Industries assertion that there is no evidence to conclusively associate cigarette smoking with disease (Slade, Bero, Hanauer, Barnes and Glantz, 1995).

2.3 ADDICTION

Many drugs can be addictive, and not everyone gets addicted to any particular drug. There can be no single physiological mechanism, which explains addiction. Something else has to account for the variety of reactions people have when different chemicals are introduced into their bodies. (Peele and Brodsky, 1975)

2.3.1 Psychosocial approach to addiction:

The belief in addiction encourages a susceptibility to addiction. By convincing people that such a thing, as physiological addiction exists, that there are drugs, which can take control of one's mind and body, society makes it easier for people to relinquish themselves to a drug's power. It should be acknowledged people do respond to powerful drugs, even regular doses of them, in different ways. At the same time, people respond to a variety of different drugs, as well as experiences that have nothing to do with drugs, with similar patterns of behaviour. Thus, a concept of addiction is needed that emphasizes the way people interpret and organize their experience. Anything that people use to release their consciousness can be addictively misused. The choice of object is irrelevant to this universal process of becoming dependent. (Peele and Brodsky, 1975)

The addict is a person who never learns to come to grips with his world, and who therefore seeks stability and reassurance through some repeated, ritualised activity. This activity is reinforced in two ways - first, by a comforting sensation
of well-being induced by the drug or other addictive object; second, by the atrophy of the addict's other interests and abilities and the general deterioration of his life situation while he is preoccupied with the addiction. As alternatives grow smaller, the addiction grows larger, until it is all there is. (Peele and Brodsky, 1975)

The most common mistake for a treatment program is to substitute one addiction for another, as people do when they begin smoking heavily to keep from overeating, or overeat to stop smoking. Something similar to this takes place in drug rehabilitation programs, even those that are otherwise constructive. When an addict is allowed to become so dependent on the support of the group that he transfers his addiction from the drug to the group. Thus, if he is forced to leave the group, he is likely to resume taking drugs. (Peele and Brodsky, 1975)

It is generally believed that people who are addicted to alcohol, cigarettes, or drugs have a chemical addiction, meaning their cells are hooked on the drug(s). But at the level of the body's chemistry, it is found that heroin or nicotine fits into the same receptors on the cell wall. An addict does not have receptors that exhibit abnormal cravings, but the truth seems to be that the cell's memory for the addictive substance is what is hooked, and it keeps creating distorted cells that reflect its weakness. In other words, an addiction is a distorted memory. If you take an addict, detoxify his body, and keep him away from alcohol or drugs for several years, all the old cells that used to be 'chemically addicted' are totally gone. Yet the memory persists, and if given a chance, the memory will latch onto the addictive substance once again. (Chopra, 1989:88)

2.3.2 Pharmaceutical approach to addiction

The pharmaceutical and behavioural processes that determine tobacco addiction are similar to those that determine addiction to drugs such as heroin and cocaine and involve indirect activation of dopamine receptors in the midbrain. (Hughes, Gust, Skoog, Keenan, and Fenwick, 1991)
Part of the addiction caused by nicotine results from its stimulation of nicotinic receptors within the caudate nucleus (the pleasure centre) of the brain, and the stimulation of dopaminergic receptors within the limbic system of the brain. (Hughes et al., 1991)

Tobacco smokers who are addicted to nicotine subconsciously adjust their nicotine intake to maintain nicotine levels at 30 - 40 nanograms of nicotine per millilitre of blood plasma. (Hughes et al., 1991)

During the early stages of tobacco smoking, nicotine causes nausea by stimulating the vomiting centre in the brain, however tolerance to this side effect of nicotine develops rapidly. (Hughes et al., 1991)

2.4 NICOTINE WITHDRAWAL

Nicotine acts as a stimulant on the central nervous system. When ingested, adrenaline production increases, raising the blood pressure and heart rate. Nicotine also affects the overall metabolic rate, the regulation of body temperature, the degree of tension in the muscles, and the levels of certain hormones. These and other metabolic changes create a pleasurable sensation in the user that often is experienced as relaxation. (Balch and Balch, 1997)

Withdrawal symptoms include irritability, frustration, anger, anxiety, difficulty concentrating, restlessness, increased appetite, headache, stomach cramps, a slowed heart rate, a rise in blood pressure, and an intense craving for nicotine. (Balch and Balch, 1997)

The period of withdrawal from nicotine may be intense and persistent, often lasting for several months. (Hughes et al., 1991)
2.5 HEALTH RISKS OF SMOKING

2.5.1 Cancer

Cigarette smoking accounts for greater than 90% of carcinomas in men and about 70% in women, with a strong dose response relationship and regression of incidence after quitting. (Berkow, 1992)

Tobacco is clearly the most identified cause of cancer, and causes more than 50,000 deaths per year in the United Kingdom alone. There are indications that cigarette consumption is starting to decline, but continued education is still needed to warn especially the young about the dangers of cigarette smoking. (Davidson, 1995)

In 1931, Otto Warburg received the Nobel Prize in medicine for his discovery that the primary condition associated with all forms of cancer is severe deprivation of oxygen to the cells of affected tissue, and that cancer cannot occur in tissues that are sufficiently oxygenated (Reid, 1988). This finding could explain why there is such a high correlation between cigarette smoking (due to the decreased oxygen intake) and cancer.

2.5.1.1 Lung cancer

(Trachea, bronchus and lung)

<table>
<thead>
<tr>
<th>Region/Country</th>
<th>Incidence per 100,000 of population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
</tr>
<tr>
<td>Northern Europe:</td>
<td>98.1</td>
</tr>
<tr>
<td>Western Europe:</td>
<td>86.7</td>
</tr>
<tr>
<td>North America:</td>
<td>74.6</td>
</tr>
<tr>
<td>Southern Europe:</td>
<td>64.2</td>
</tr>
<tr>
<td>Australia/New Zealand:</td>
<td>61.6</td>
</tr>
<tr>
<td>Eastern Europe:</td>
<td>61.2</td>
</tr>
<tr>
<td>Soviet Union:</td>
<td>51.2</td>
</tr>
<tr>
<td>Japan:</td>
<td>31.0</td>
</tr>
</tbody>
</table>

Table 1.2 Prevalence of Lung Cancer. (HyperHealth, 1999)
Bronchiogenic carcinoma accounts for greater than 90% of all lung tumours. Primary lung carcinoma is the most common cancer in men (22%) and in women (20%). (Berkow, 1992)

The typical patient is between 40-70 years old. The lung is a common site for primary tumours as well as metastases from other organs like the breast, colon, kidney, thyroid, testis, bone and prostate. (IBIS, 1999)

Smoking causes 85% of all cases of lung cancer in males, and 46% of cases in females worldwide (Yach, 1995). It may take decades before the presence of the disease is established in the individual (Yach, 1995), and the risk of developing lung cancer is dependent on the duration of time the individual smoked (Lubin, Blot, Berrino, Flamant, Gillis, Kunze, Schmahl, and Visco, 1984).

Most lung cancers are clearly associated with cigarette smoking, which explains the continual rise in lung cancers in women paralleling their increase in smoking (Berkow, 1992). The incidence pattern of different histological types of lung cancer also follows changing trends of smoking over time. Due to the increased use of low tar and filtered cigarettes since the 1970's, an increase in the incidence of adenocarcinoma, especially amongst women has been reported (Zheng, Holford, Boyle, Chen, Ward, Flannery, and Mayne, 1994).

In South Africa, lung cancer is the most common cancer in coloured males (Sitas and Pacella 1994), and accounts for 24% of all deaths from cancer in men (Yach, 1995). The five-year survival rate of lung cancer is less than 10%, a rate that is not appreciably improved by early diagnosis or treatment. (Carbone, 1992)

The shorter the duration of smoking, the greater the protective effect of giving up becomes. Reducing the number of cigarettes smoked or changing to filter brands does lower the risk of developing lung cancer, but not to the extent associated with complete cessation of smoking. (Lubin et al., 1984)
Beta-Carotene helps to prevent lung cancer. Smokers who consume high levels (approximately 6 mg per day) of Beta-Carotene have the same rate of Lung cancer as non-smokers. (Pearson, 1998)

2.5.1.2 Oral cancer
(Mouth, larynx, pharynx and oesophagus)

Smokers experience a significantly higher risk of developing oral cancer than non-smokers. This is exemplified especially if the smoking is combined with habitual drinking. (Christen, 1992)

Usually painless red lesions may appear in the early stages, these red lesions may appear benign. A white patch of leukoplakia on the oral mucosa, which occurs six times more frequently in smokers than in non-smokers, has a 2-6% risk of malignant transformation. (Christen, 1992)

Cancer can produce a thickening anywhere on the oral mucosa, causing cratering or bulging of the tissue, with or without ulceration or bleeding Leukoplakia. (Christen, 1992)

2.5.1.3 Breast cancer

Breast cancer is the most common cancer amongst women in the world, and its incidence is increasing. The prognosis after treatment has not improved greatly during the past few decades, with a five-year survival rate of 64%. (Davidson, 1995)

Recent studies have shown a pronounced increase in breast cancer amongst women who have smoked for more than 20 years compared to non-smokers, and a significant increase in women who have smoked for more than 30 years. (Bennicke, Conrad, Sabroe and Sorenson, 1995)
2.5.1.4 Other cancer

The number of cigarettes smoked, the duration of smoking and extent of inhalation all correlate to the degree of the relative risk of developing cancer. The relative risk of bladder cancer has been found to be approximately double in smokers, compared with non-smokers. (Carbone, 1992)

The incidence of pancreatic cancer has tripled over the last forty years. It is a rare cancer, accounting for only 2-3% of all cancers; however, it accounts for 10% of all fatal abdominal malignancies. (Carbone, 1992)

Pancreatic cancer is now the fourth most common fatal cancer in the U.S. It is mainly seen between the years of 35-70, with the peak at about 60, and is 3-4 times more common in men. There is no known cause, although chronic pancreatitis, smoking, certain chemicals (coke and metal workers, gas plant workers), coffee, alcohol and diabetes mellitus (only in women) are risk factors. (Carbone, 1992)

2.5.2 Cardiovascular disease

Atherosclerotic diseases along with hypertension and cholesterol disorders are the three major risk factors for coronary vascular disease. Cigarette smoking is a major cause of atherosclerotic disease as well as an established risk factor for cerebrovascular disease, abdominal aortic aneurysm, and peripheral vascular disease. (McBride, 1992)

Nicotine and other constituents of tobacco smoke have multiple effects on the cardiovascular system. These effects lead to pathological changes and disturbances of metabolic and physiological processes. Smoking has both acute and chronic effects on the haematological system, greatly increasing the risk of
thrombosis, and reducing the effectiveness of hypertension treatment (McBride, 1992). Tobacco smoking increases the "stickiness" of platelets, thereby contributing to abnormal blood clotting. (Adams, Jessup, and Celermajer, 1997)

Tobacco smoking increases the risk of atherosclerosis by causing thickening of the blood (due to polynuclear aromatic hydrocarbons), by stimulating the adhesion of monocytes to the endothelium, and constriction of the blood vessels due to the nicotine in the tobacco smoke. (Adams et al., 1997)

The risk of developing coronary artery disease is associated with the intensity and not the duration of smoking, and even low-tar cigarettes still greatly increase the rate of myocardial infarction. This factor is much more extreme in early adult life (30-40 years) than in old age. (Parish, Collins, Peto, Youngman, Barton, Jayne, Clarke, Appleby, Lyon, Cederholm-Williams, Marshall, and Sleight, 1995)

The risk of acute myocardial infarction and sudden death can be immediately decreased at any age by the progressive benefits provided by smoking cessation. (Commerford, 1995)

2.5.3 Respiratory disease

In 1964 the US Surgeon General issued a report recognizing cigarette smoking as a significant risk factor for the development of both respiratory symptoms and disease (Samet, 1992). Cigarette smoking is probably responsible for at least 90% of lung carcinomas, with the risk being directly proportional to the number of cigarettes smoked and to the tar content of the cigarettes (Davidson, 1995).

Tobacco smoking has significant detrimental effects on both the structure and function of the lung. This is the single most important risk factor of chronic obstructive pulmonary disease (COPD), such as chronic bronchitis and emphysema. Symptoms such as chronic cough and phlegm production, wheeze
and dyspnoea are directly associated with the number of cigarettes smoked per day. (Sherman, 1992)

The effects of smoking include changes in central and peripheral airways, the alveoli and capillaries, and the immune system. This results in blunted immune response amongst smokers to influenza vaccinations, and increased mortality from influenza and pneumonia. (Sherman, 1992)

### 2.5.4 Other health risks

#### 2.5.4.1 Oral disease

Smoking has been shown to lead to an increased incidence of stomatitis nicotina (smokers palate), diffuse palatal keratosis, chronic periodontitis, acute necrotising ulcerative gingivitis (trench mouth), dental calculus, halitosis and dental staining. (Christen, 1992)

#### 2.5.4.2 Diabetes mellitus

A recent study has shown that, independent of body size, people who smoke have a higher transient increase in blood glucose concentration after an oral glucose challenge, and an increased resistance to insulin. Cigarette smoking may be an independent modifiable risk factor for patients with non-insulin dependant diabetes mellitus. (Rimm, 1995)

#### 2.5.4.3 Thyroid function

The components of tobacco smoke interfere with thyroid function, hormone balance and action. This noxious effect becomes apparent when thyroid function
is slightly compromised, such as in disorders like hypothyroidism. (Muller, Zulewski, Huber, Ratcliffe, and Staub, 1995)

2.5.4.4 Oxidative damage

About $10^{15}$ free radicals are generated from each puff of a cigarette. This initiates an inflammatory response and cause tissue damage, which result in further tissue damage. (Margetts and Jackson, 1993)

Smokers have significantly lower plasma concentration levels of the anti-oxidants ascorbic acid, beta-carotene and vitamin E (Giraud, Lewith and Machin; 1984). Other studies conducted found that after only two weeks abstinence from smoking, there was a decrease in the oxidative damage and thus was probably due to a significant drop in the circulatory products of lipid peroxidation. (Morrow, Frei, Longmire, Ganiano, Lunch, Shyr, Strauss, Oates and Roberts, 1995)

2.5.4.5 Peptic ulcer disease

Cigarette smoking has been causally associated with peptic ulcer disease. Smoking decreases bicarbonate and decreases gastric emptying time (HyperHealth, 1999). Smokers have slower healing of duodenal ulcers and are more likely to have reoccurrences of both duodenal and gastric ulcers (Samet, 1992).

2.5.4.6 Fertility

Nicotine inhibits steroid genesis. In female smokers this results in a lower concentration of endogenous oestrogen, and is possibly the mechanism whereby female smokers have been shown to take longer to conceive after stopping contraception. (Rosevear, Holt, Lee, Ford, Wardle and Hull, 1992)
Using the combined effect of smoking and birth control pills presents a significantly increased risk for suffering a fatal heart attack. Research has demonstrated a 500% increase in the risk of a fatal heart attack when smoking is added to the risks associated with oral contraceptives. These risks are particularly greater among women over the age of thirty-five who face an especially greater risk of death due to a circulatory disease, such as a stroke. These contraceptive-related risks may be even greater among those female smokers with a history of migraines. (Lewis, 1998)

Female smokers seem to reach menopause an average of two years earlier than non-smokers. (Wallis, 1995)

2.5.4.7 Foetal disorders

Smoking has been contraindicated during pregnancy due to mutagenic and teratogenic properties (Brinker, 1996) as well as lower birth weight and size and higher risk of pre-maturity, miscarriage, and neurological impairment to the baby (Ferguson, 1987). Smoking during pregnancy leads to an increased risk of bearing low birth weight infants, spontaneous abortion, and bearing live babies with congenital abnormalities (Shepard, 1982:195).

Nicotine crosses the placental barrier quite rapidly, targeting the adrenal glands, heart and kidneys of the foetus. Foetal haemoglobin also has a much stronger affinity for carbon monoxide, raising the foetal carboxyhaemoglobin levels to 10-15% higher than those of the mother, thus causing a drop in foetal arterial oxygen pressure. The effects on the mature foetus include a rise in systemic blood pressure, acidosis, hypoxia and changes in the excitability of the central nervous system. (Shepard, 1982:195)
2.5.4.8 HIV infection

Smoking cessation is encouraged as a short-term health benefit in HIV patients. Studies have shown a dose dependent effect on CD-4 Lymphocyte counts and an increased risk of developing bacterial pneumonia in smokers with HIV infection compared to non-smoking HIV sero-positive patients. (Chaisson, 1994:564)

2.5.4.9 Psychogenic diseases

Smokers rate higher on symptomatic measures of both anxiety and depression. Anxiety and depression have the highest antecedents of smoking relapse after cessation. (Glassman, Helzer, Covey, Cottler, Stetner, Tipp and Johnson, 1990)

Bupropion helps people attempting to “quit” tobacco smoking and to avoid the anxiety associated with nicotine withdrawal. Twice as many subjects using Wellbutrin\textsuperscript{®} during nicotine withdrawal were able to remain cigarette free a year after smoking cessation as those not using Wellbutrin\textsuperscript{®}. (Gourlay, 1990)

2.5.4.10 Vertebral column

Balch and Balch (1997) reported a study revealing that smoking a pack or more of cigarettes a day triples the risk of needing surgery for a herniated intervertebral disc.

2.6 HEALTH RISKS OF ENVIRONMENTAL TOBACCO SMOKE

2.6.1 Constituents of Environmental Tobacco Smoke

The US Environmental protection agency has graded Environmental tobacco smoke, which results in the condition known as passive smoking as a class A carcinogen. (HyperHealth, 1999)
Environmental tobacco smoke is composed of the following:

1.) Mainstream smoke, which is exhaled by the smoker,
2.) Side stream smoke, which is emitted from the burning cigarette in between puffs.

Ninety five percent of Environmental tobacco smoke is formed from side stream smoke. This side stream contains greater concentrations of carbon monoxide than mainstream smoke. Increased Carbon monoxide exposure has been known to cause increased blood carboxyhaemoglobin levels which have an immediate adverse effect on vascular disease. (Shephard, 1982:195)

Side stream smoke contains smaller particles than mainstream smoke, and these are deposited in the most distal alveolar portions of the lung. (Byrd, 1992)

The principal factors affecting the health risks presented by Environmental tobacco smoke are:

1.) Room size,
2.) Ventilation,
3.) Temperature and humidity,
4.) Number of people in the room,
5.) Amount and type of tobacco smoked, and
6.) Volatility of agents.

The concentrations of nicotine and its metabolite, cotinine in the body fluids, can be used to accurately measure foetal transmission of tobacco (Wall, Johnson, Jacob and Benowitz, 1988; Jarvis, Russell, Benowitz and Feyerabend, 1988). Cotinine has longer half-life than nicotine (of about 20 hours), and is the preferred marker as it indicates conclusively that there has been exposure to tobacco products (Fielding and Phenow, 1988). It can be traced in the saliva (Strachan,
Jarvis and Feyerabend, 1989), urine (Greenberg, Haley, Etzel and Loda, 1984),
and breast milk (Klonoff-Cohen, Edelstein, Lefkowitz, Srinivasan, Kaegi, Chang,
and Wiley, 1995) as non-invasive methods of measuring Environmental tobacco
smoke exposure.

Common symptoms of exposure to Environmental tobacco smoke are eye
irritation, headache, coughing, running nose, phlegm, wheezing, nausea and
dizziness. (Shephard, 1982:195)

Smoking has now become prohibited in many workplaces and public buildings.
(Balch and Balch, 1997)

2.6.2 Health risks in early childhood

Sudden Infant Death Syndrome is the unexpected death of an apparently healthy
infant. Passive smoking in the same room as an infant increases the risk factor for
Sudden Infant Death Syndrome. (Klonoff-Cohen et al, 1983)

Many studies have shown a direct association between parental smoking statuses
and the incidence of upper and lower respiratory tract illness in young children
(Greenberg et al, 1984; Fielding and Phenow, 1988). Chronic middle ear effusion
(Strauchan et al, 1989), chronic otitis media, and increased incidences in
tonsillectomies and adenoidectomies have also been reported (Fielding and
Phenow, 1988). Children of male smokers have been shown to be at a higher than
normal risk of developing brain cancer and leukemia (Balch and Balch, 1997).

Tobacco smoke can raise the total IgE serum concentration. This leads to an
increase in the frequency of allergic disease, particularly eczema, in the offspring
of women who smoke. (Newman-Taylor, 1995)

Research has shown that children of people who smoke may inherit a smoking
addiction even before they are born. The foetuses in the womb absorb nicotine,
carbon dioxide, tar and second hand smoke from both parents, some even pull away from the uterus wall. (Rector Page, 1997:408)

2.6.3 Health risks in adults

Smoking has detrimental effects on nutrition, smokers break down vitamin C twice as fast as non-smokers. Cigarette smoke contains high concentrations of nitrogen dioxide ozone, a compound that oxidizes the anti-oxidant vitamins and is also known to damage to DNA. The accelerated anti-oxidant usage, in combination with the DNA damage, speeds the aging process. (Balch and Balch, 1997)

Passive exposures to tobacco smoke leads to an increased risk of developing acute respiratory infections, adverse reactions to industrial dusts, and chronic bronchitis. (Shephard, 1982:195)

Studies conducted have shown a significant association between passive smoking and lung cancer (Fielding and Phenow; 1988). Passive smoking has also been associated with ischaemic heart disease, acute cardiovascular effects and worsening of angina pectoris. (Byrd, 1992)

2.7 NEGATIVE EFFECTS OF SMOKING CESSATION

2.7.1 Major depression

Individuals, who have suffered from a major depressive disorder at some time in their lives, show more frequently a history of regular smoking, and less successful attempts to quit. Clinical experience has shown that those few depressed smokers who do succeed in stopping smoking are at increased risk to develop another episode of major depression. (Glassman et al., 1990)
2.7.2 Ulcerative colitis

Ulcerative colitis is largely a disease of non-smokers, and patients who smoke intermittently often experience improvement in their colitis symptoms during periods when they are smoking. (Thomas, Rhodes, Mani, Williams, Newcombe, Russell and Feyerabend, 1995)

Trials have been conducted using Transdermal nicotine patches to treat active colitis and for maintenance therapy. (Thomas et al., 1995)

2.7.3 Weight gain

Weight gain and fear of weight gain are two of the five most common reasons given for smoking relapse after abstinence. (Orleans, 1994)

People who quit smoking have been shown to weigh the same on average as people who have never smoked. (Heart foundation, 1999)

A ten-year follow up study in the USA found a weight gain of 4.4kg for men and 5kg for women after smoking cessation. Most of this weight gain occurred shortly after smoking cessation, with a subsequent decline in weight gain. (Flegal, 1995)

Smoking cessation has even been suggested as a possible contributory factor to the increase in the prevalence of overweight people in the United States. (Flegal, 1995)

Nicotine helps to prevent obesity by increasing the body's basal metabolic rate. Nicorette® (chewing gum containing Nicotine) is under investigation as a novel means of preventing obesity. (HyperHealth, 1997)
2.7.4 Alzheimer's disease

Recent studies have concluded that Nicotine may help in the prevention Alzheimer's disease. (HyperHealth, 1997)

Nicotine increases the attention span in persons afflicted with Alzheimer's disease, and constant Nicotine exposure (e.g. in persons who smoke Tobacco) has recently revealed epidemiological evidence that smokers are statistically less likely to develop Alzheimer’s disease. (Brenner, 1993)

Nicotine stimulates and increases the number of nicotinic receptors within the brain (an area of the brain known as the Nucleus Accumbens contains a large number of these Nicotinic Receptors); this has been shown to increases attention span, learning ability and short-term memory. Research studies using rats administered with Nicotine, exhibited a significant increase in working memory as measured by the radial-arm maze. (Levin, 1995)

2.7.5 Parkinson's disease

Recent studies have shown that Nicotine is a useful treatment for Parkinson's disease as it increases attention span, learning ability and short-term memory. (Seidler, 1996)

2.8 METHODS OF SMOKING CESSION

Nicotine is responsible for the addictive potential of Tobacco (e.g. cigarettes). Each cigarette contains an average of 0.5 – 2.0 mg of Nicotine, and an average of 20% of this Nicotine enters the bloodstream and brain after smoking each cigarette. (HyperHealth, 1997)
Nicotine is readily absorbed from every site on or within the body including the lungs, nasal mucosa, skin and intestines. (IBIS, 1997)

After its absorption, Nicotine is rapidly and thoroughly distributed throughout the body and rapidly crosses the blood-brain barrier. The elimination half-life of Nicotine is approximately 2 hours (this short half-life accounts for Smokers' requirements for frequent administration of nicotine via cigarettes). (Hughes, 1991)

Although most people who stop smoking do so without the use of professional help or an organized programme, many smokers are unable to stop on their own and seek assistance in quitting. (Schwartz, 1992)

2.8.1 Nicotine replacement therapy

The American Psychiatric Association has recognized nicotine withdrawal as essentially nicotine induced organic mental disorder, and nicotine dependence as a psychoactive substance use disorder. (Gritz, 1994)

Nicotine replacement techniques do not treat the behavioural aspects of smoking, and Nicotine replacements have only been shown to alleviate withdrawal, with long-term cessation rates at between 10% and 30% (Gritz, 1994). It is advisable that smoking should cease before the commencement of any form of nicotine replacement therapy, this may result in a variety of undesirable side effects or an accidental overdose of nicotine may result (Gordon, 1995).

Nicotine taken orally is largely metabolised in the liver before reaching the systemic circulation. Direct absorption into the systemic circulation through the buccal or nasal mucosa, the alveoli, or the skin can, however, produce sufficient concentrations of nicotine in the blood to partially allay withdrawal symptoms. (Tang, Law and Wald, 1994)
Nicotine preparations are contra-indicated in many patients. Many are the same risks as for continuation of smoking, such as pregnant women, mothers who are breastfeeding, and patients with recent myocardial infarction or cerebrovascular accident, unstable angina and severe arrhythmia. (Simpson and Polson, 1995)

Patients suffering from hypertension, coronary artery disease, peripheral vascular disease, peptic ulcer disease and diabetes mellitus are also warned against the use of Nicotine replacement therapy. (Simpson and Polson, 1995)

2.8.1.1 Nicotine Polacrilex Gum

Nicotine is a constituent of Nicorette® Chewing Gum (2 - 4 mg of Nicotine per piece of gum) in a slow-release resin complex that allows reforming smokers to control their intake of nicotine and to minimize nicotine's withdrawal symptoms (HyperHealth, 1997). Intermittent chewing releases about 90% of the available nicotine after 20 minutes, most of which is absorbed through the buccal mucosa (Tang et al., 1994). In South Africa a 2mg chewing gum is available over the counter at pharmacies, while the 4mg treatment is supplied on prescription only.

Nicotine chewing gum was the first type of nicotine replacement therapy to become available. Oral and gastric side effects have been reported, along with impaired absorption when taken with coffee or acid beverages, and a risk that some smokers might transfer their dependency to the gum have limited its usefulness. (Hughes, 1986; Silagy et al., 1994)

Intervention programmes have been shown to greatly increase the effectiveness of nicotine gum in reducing withdrawal symptoms associated with smoking cessation. The 4mg gum has been found to be more effective than the nicotine patch in ‘high dependence’ smokers with an approximate 30% success rate. (Tang et al., 1994)
Nicorette® is under investigation as a means of preventing obesity as nicotine helps to prevent obesity by increasing the body's basal metabolic rate. (HyperHealth, 1997)

2.8.1.2 Transdermal Nicotine Patch

Nicotine is a constituent of Transdermal Nicotine Patches that allow the slow-release of nicotine via the skin in dosage levels ranging from 14 mg to 25 mg (HyperHealth, 1997). The nicotine is incorporated into the adhesive layer and delivered into the blood system over 16 hours. A new patch is applied each morning to the upper arm, trunk, buttock or thigh and removed before going to bed (Russell, Stapleton, Feyerabend, Wiseman, Gustavsson, Sawe and Connor, 1993). It is believed that use of a 24-hour patch may result in disturbed sleep and vivid dreams (Mendelsohn and Richmond, 1995). Each patch allows reforming Tobacco smokers to minimize their craving for nicotine and to minimize nicotine withdrawal symptoms (HyperHealth, 1997).

In a randomised, controlled trial of transdermal nicotine patches, it was reported that a reduction in the severity of craving and adverse mood changes in the first weeks of withdrawal, and double the initial rate of cessation compared to the placebo group. There was however a 16.4% incidence of moderate to severe local irritation or itching at the patch site. (Russell et al., 1993)

It is recommended that during a course of treatment, several weeks’ use of full strength treatment must be followed by a weaning period of weaker strength patches (Russell et al., 1993). A 22.6% abstinence rate using nicotine patches was reported at 6 months, compared to a placebo group rate of 11% (Mendelsohn and Richmond, 1995).
2.8.1.3 Nicotine Nasal Spray

Nicotine nasal spray is the most recent form of Nicotine replacement therapy to become available, and was developed to provide a more rapid form of nicotine absorption, compared to the transdermal patch and chewing gum. (Henningfield, 1995)

Relatively few studies have been conducted using nicotine nasal spray, but it has been shown to reduce tobacco withdrawal symptoms, craving for cigarette and weight gain in abstinent subjects. (Sutherland, Stapleton, Russell, Jarvis, Hajek, Belcher and Feyerabend, 1992)

Side effects associated with nicotine nasal spray are sore nostrils, blocked nose, nasal blood spotting, minor epistaxis, nasal ulceration, vomiting, sneezing, throat irritation, watering eyes and coughing. (Sutherland et al., 1992)

2.8.1.4 Pharmaceutical drugs used in smoking cessation

Bupropion (Wellbutrin®) helps to avoid the irritability and anxiety associated with nicotine withdrawal. Research has reported twice as many subjects using Wellbutrin® during nicotine withdrawal were able to remain smoke free a year after quitting as those not using Wellbutrin®. (Gourlay, 1990)

Clonidine® (normally used as an Antihypertensive) reduces the craving for nicotine and reduces the severity of the withdrawal symptoms associated with nicotine. Research has shown that Clonidine® doubles the number (from 30 to 60%) of reformed smokers who manage to abstain from tobacco smoking for 6 months or more. (Gourlay, 1990)

Dimethylaminoethanol (DMAE) has been reported to increases willpower. Research after 6 weeks of DMAE use, has reported success rates in subjects who previously were unable to stop smoking. (Gourlay, 1990)
2.8.2 Hypnosis

Hypnosis is a popular method of smoking cessation, yet the reports regarding its effectiveness as a smoking cure are contradictory. (Schwartz, 1992)

Quit rates range from 0% - 68% for individual hypnosis and from 8% - 88% for group hypnosis. (Lewith, 1995)

Hypnotic treatment for smoking cessation is most successful when combined with educational advice and counselling (Schwartz, 1992). It is also emphasized that the skill and experience of the therapist are important determinants for the efficacy of hypnosis.

2.8.3 Behavioural methods

Nicotine has very strong addiction (Drug Dependence) potential, smoking cessation is extremely difficult to achieve, as the complexity of the nicotine addiction, psychological concerns as well as physiological processes must be addressed in order to improve the chance of success. (Simpson and Polson, 1995)

The average smoker has three failed attempts to stop smoking before achieving success (Simpson and Polson, 1995), and intervention by health professionals is seen as essential, as well as all methods to induce cessation have shown an improvement in quit rates if combined with counselling (Schwartz, 1992).

Ninety-two percent of teenage smokers in the USA say they don’t plan to be smoking one year later, and yet only 1.5% manages to quit. (Lee and Lee, 1994)
There are several stages of smoking cessation from pre-contemplation to contemplation, preparation to action, and then possible relapses, with eventual maintenance of cessation. (Simpson and Polson, 1995)

Aversive procedures involve the performance of a noxious event immediately following the behaviour in order to decrease the likelihood of that behaviour. Examples would be the use of aversion therapy for smoking cessation, or in the treatment of anxiety disorders. (IBIS, 1997)

The system of the four A’s was devised as a simple method of physician intervention:

1.) Ask the patients about their smoking.
2.) Advise them to stop.
3.) Assist them to choose between methods of cessation.
4.) Arrange follow up visits.

Prevention is the number one priority of smoking intervention policies (Gritz, 1994). By promoting children’s beliefs in their ability to perform health enhancing actions and increasing their self confidence, has led to a corresponding decrease in the use of tobacco (Hunter, Steyn, Yach and Simpamla, 1991).

High intensity intervention in rural communities has led to a 30,6% drop in smoking among women, and a 8,4% drop in male smokers. (Steenkamp, Jooste, Jordaan, Swanepoel and Rossouw, 1991)

2.8.4 Acupuncture

Acupuncture is an ancient form of therapy that is unique to traditional Chinese medicine. It works on the human energy system by applying needles to vital energy points located along the meridian system. Theses points influence the currents of electromagnetic energies that flow through the channels. These altered
energy currents then carry the therapeutic effects to the target internal organs and tissues, balancing and regulating their functions. (Hicks, 1997)

The meridians and finer branch channels used in acupuncture form a grid like network that constitutes a template outlining the entire human body. These channels, and the energy currents that run through them, compose a very real, albeit, invisible, body of subtle energies that govern the functions of the physical body. This energy body known as 'Chee' has been captured on film using Kirlian photography, thus illustrating the existence of the meridian channels throughout the human body. (Hicks, 1997)

Although acupuncture is an ancient method of treatment, its method of action is uncertain. Successful electro-acupuncture has been associated with a rise in cerebrospinal fluid met-encephalin levels. (Clement-Jones, McLoughlin, Lowry, Besser, Rees and Wen, 1979)

Research into the efficacy of acupuncture has often dealt with the concept of placebo treatment by comparing ‘sham’ points with real acupuncture needling (Margolin et al., 1995). The lack of significant difference between the needling of ‘sham’ and conventional acupuncture points may be due to endorphin release after acupuncture at any site (Schwartz, 1988).

Acupuncture assists some people to withdraw from tobacco smoking as it minimizes the drug withdrawal symptoms caused by nicotine withdrawal. (Jiang, 1994)

Acupuncture is increasing in popularity as a method of smoking cassation (Schwartz, 1988). Studies conducted have used various types of acupuncture such as naso-puncture, auricular therapy, electro-acupuncture and laser acupuncture (Schwartz, 1992).
The results of acupuncture treatment for smoking cessation vary according to different studies: From 18-61% at 6 months to 16-40% at one year (Schwartz, 1988). Other studies using auricular acupuncture report a 41% success rate at six months, but suggest that if the patient’s motivation is weak, relapses will occur (Fuller, 1982).

Acupuncture is sometimes effective in people who have attempted other means of Tobacco withdrawal. Research results indicate that the results of acupuncture in tobacco smokers are similar to those attained using the nicotine chewing gum method of abstinence. (Jiang, 1994)

Acupuncture is not a guaranteed means of long-lasting tobacco withdrawal as it is associated with recurrence in many people, a gradual decrease of therapeutic effects as time passes and its immediate effects are often unstable. Approximately 25% of people using acupuncture for smoking cessation, progress to permanent tobacco abstinence. (Jiang, 1994)

2.8.4.1 Auricular Acupuncture

Auricular acupuncture is a historical form of acupuncture. It is used widely in the Orient and in the West. In France, the Nogier school of Ear acupuncture is well known. In West Germany, the Munich Auriculotherapy Association counts over 3000 members. (Jayasuriya, 1993)

The ear has rich nerve supply derived from several spinal segments. In addition branches of the vagus, glossopharyngeal, trigeminal and facial nerves supply the ear. There is a rich blood supply from branches of adjoining arteries, with both sympathetic and parasympathetic fibres running close to the blood vessels. As the nerves spread out widely and have connections with all areas of the body including the internal organs, changes for instance in the stomach, will exhibit changes in its collateral branch which supplies the ear. (Jayasuriya, 1993 and Gray, 1967)
The use of acupuncture treatment in drug addiction was first reported in 1973. However no double-blind studies on human subjects have been conducted. The study examined the effectiveness of acupuncture in treating withdrawal symptoms due to narcotics, alcohol, and other drugs. Due to the small number of patients available, it was not possible to achieve statistical evidence that acupuncture is useful in treating withdrawal symptoms. There is clinical evidence, however, that it helps to relieve and decrease the intensity of withdrawal symptoms. Whether a patient is able to maintain abstinence depends on his motivation, his social and environmental background, and the emotional support available to him through family, friends, and various professions. (Leung, 1977)

Auricular acupuncture can play a leading role as a quick, inexpensive and simple treatment of drug and alcohol addiction. Experiments of this nature have been carried out successfully in Hong Kong and in the United States. The patient is completely free and disintoxicated, as proven by various tests, within 60 days after inception of treatment. (Wexu, 1975)

In 1979 Chu, Yeh and Wood reported success in treating 30 opium addicts and 10 heroin addicts. With the exception of one patient, all were completely free of withdrawal symptoms.

Wexu (1975) stated that nothing is more effective in treating tension in whatever forms it may present itself than acupuncture. By reducing the tension proportionately to each individual by means of acupuncture, the body can disintoxicate itself more rapidly and adjust to the environment.

Acupuncture is increasing in popularity as a method of smoking cessation. Trials were conducted using various types of acupuncture, but very few trials using auricular acupuncture. Double blind placebo control of trials cannot be used to test the efficacy of acupuncture due to the nature of the treatment. (de la Rouviere, 1996)
Semi-permanent auricular press needles are useful in treating participants who cannot come for treatment as often as necessary, for feeble people, chronic sufferers who react to a more gradual stimulation, children, and drug addicts (Wexu; 1975). Press needles must be retained at an appropriate point in the ear throughout the treatment period, the needle being replaced at a new ear point every four to seven days (Jayasuriya, 1993).

The press needle is suitable for superficial insertion in a vertical direction. During insertion, the needle-ring is clipped with a forceps or with fingers, and then the needle-tip is placed accurately into the selected acupuncture point. After a light twisting, press the needle in, and fix it tightly with an oblique adhesive plaster. (Medicine and Health Publishing Co., 1991)

2.8.5 Homoeopathy

Homoeopathy is a system of medicine founded by Hahnemann (1755-1843). His foundation of a fundamental law of healing, called the law of similars, states that a patient will be cured by a medicinal substances that produces the same disease symptoms in a healthy person. (IBIS, 1997)

The use of homoeopathic remedies has been recorded in only one study (Labadie, Dones, Gachie, Freour, Perchoc and Huynh-Van-Thao, 1983). In this study the homoeopathic remedies were used as an adjunctive therapy to tranquillizers and acupuncture treatment.

A study comparing acupuncture and homoeopathic treatment in the cessation of smoking (de la Rouviere, 1996), using one session of Traditional Chinese acupuncture and moxibustion, based on the ‘smoking formula’ of Lavier (1975:343), and a three month course of a homoeopathic isotherapy. Homoeopathy could have had an unfair advantage over acupuncture as the homoeopathic treatment had a constant reinforcement of its therapeutic effect.
This study concluded that homoeopathy was 7% more effective than Traditional Chinese acupuncture.

2.8.5.1 Isotherapy

Isotherapy uses the 'same' (iso-) instead of the 'similar' (homoeo-) as medicines for curing disease. Isotherapy is the treatment of disease by means of presumed exopathic or endopathic causal agents, or by a product of the manifestation of the same disease. (Gaier, 1991)

Treatment of a diseased organ or a disturbed function by a non-pathological secretion or excretion from 'similar' organ, or from the pathognomonically associated tissue, of a plant or animal, is believed to be capable of inducing a reactive state in the patient. (Gaier, 1991)

There is a great deal of similarity in concept between the doctrine of isopathy and the doctrine of nosodes. Isopathy seeks out the identical 'similar' for the homeopathic cure for patient; the nosode seeks the same for the disease process. Bringing these two goals together in a single isopathic remedy form may be an effective way to use homeopathic curative power in light of a single individual's unique metabolic and pathological condition. (IBIS, 1997)

Many clinical trials in homoeopathy have used isotherapeutic remedies because it simplifies experimental design by standardizing both the pathological condition and the remedy. (Ives, 1983)

A study successfully used mixed grass pollen 30CH for treating hay fever, with a significant reduction in symptoms when compared with a placebo group (Reilly, Taylor, McSharry and Aitchison, 1986).

de la Rouviere (1996) completed a comparison study using a homoeopathic hetero-isotherapy and Traditional Chinese acupuncture. The study used the
particular brand and strength of cigarette smoked by the patient. This was used to produce a homoeopathic tincture, and dispensed to the participant in a 9CH potency.

In drug addiction an isotherapeutic made with the addictive substance (e.g. Heroinum, Tabacum) may be used to expedite the withdrawal of the offending substance. (Jayasuriya, 1993)

Hahnemann's fundamental law of healing, called the law of similars, states that a person will be cured by a medicinal substance producing the same disease symptoms in a healthy person (Hahnemann, 1982). Thus treating smoking cessation using a isotherapeutic produced with the exact brand and strength of cigarette smoked by the patient, would correspond to this fundamental law of homoeopathy, but the remedy would be more specific to the individual, and therefore better results should be obtained.
3 CHAPTER 3 - MATERIALS AND METHODS

3.1 STUDY DESIGN

The study was a clinical trial, comparing the results of an auricular acupuncture treatment group with a homoeopathic hetero-isotherapeutic treatment group in participants anxious to cease smoking or reduce the number of cigarettes they consume.

A total of 60 participants were treated for 4 weeks over a trial period of 6 weeks. Half of the participants received auricular acupuncture treatment and the other half received homoeopathic hetero-isotherapeutic treatment.

The initial appointments with the respondents were utilized to determine their eligibility in terms of the criteria necessary for admission into the study. All respondents fulfilled these criteria (Section 3.2).

Participants were then asked to complete an informed consent document (Appendix 1) stating the full intention of the study and that participants could withdraw at any time. A smoking history (Appendix 4) was obtained, with a brief medical, surgical and family history where appropriate.

During the initial consultation, participants were requested to complete a set of questionnaires. The questionnaires consisted of 2 parts (Appendices 2 and 3) and any queries regarding the questions were clarified. It is assumed the questionnaires were answered truthfully.

Participants were paired according to similar nicotine dependencies. These pairs were then divided into two assigning one person to the auricular acupuncture treatment group and the other person to the homoeopathic treatment group.
Participants were given daily smoking logs (Appendix 6) which they were required to fill in every time they smoked a cigarette. It is assumed that the smoking logs were filled in correctly and truthfully.

A copy of ‘Coping with Withdrawal’ (Appendix 5) was given to each participant. This is a simple guide to basic measures which can be taken to reduce the severity of nicotine withdrawal symptoms. (Medical Association of South Africa)

Each participant was informed whether they would receive auricular acupuncture treatment or homoeopathic treatment, and an appointment was made for the first day of treatment.

Follow-up appointments were made for 1, 2, 3, 4, and 6 weeks after the initial consultation. During follow-up consultations, auricular acupuncture treatments were administered, the daily smoking logs were submitted and smoking cessation monitored. If the participant had quit smoking, the daily logs remained blank.

At the follow-up appointments, participants were requested to return their daily smoking logs. At the end of the study the daily smoking log of each participant was totalled, and the mean and the median values for each group were statistically analysed.

3.2 SUBJECTS

All participants in the study responded via word of mouth. 60 people were accepted to participate in the trial, assigning 30 participants to the auricular acupuncture group, and the remaining 30 participants to the homoeopathic group.

All respondents fulfilled the criteria necessary for admission to the study. These criteria stated that participants should be over 18 years of age, smoke more than
five cigarettes daily for longer than a three-month period, and be literate to the extent of being able to understand and complete the given questionnaires.

The 60 participants were paired according to similar nicotine dependencies. This was done to try and eliminate as many variables as possible. These pairs were then randomly divided, one person being assigned to the auricular acupuncture treatment group and the other person to the homoeopathic treatment group. Details of the composition of the groups and their smoking history are illustrated in Table 4.1.

3.3 INTERVENTION

3.3.1 Auricular Acupuncture treatment group

The auricular acupuncture treatment consisted of three auricular acupuncture points, Lung 1, Lung 2 and Large Intestine (Jayasuriya, 1993). This acupuncture formula has been used successfully by the neuro-surgical unit of the Kwong Wah Hospital for relieving drug withdrawal syndromes and counteracting drug addiction. All auricular acupuncture treatments were only performed on the right ear. Figure 1 illustrates the location and graphical representation of the three auricular acupuncture points to be used.
The auricular acupuncture treatments were repeated once weekly by the researcher for the four week treatment period. The needles were pre-sterilized disposable Hua Tuo press needles. All needles that were used in this study were obtained from Lawo Africa, Cape Town. The needles were 0.26mm X 2mm and made of stainless-steel. By using semi-permanent press needles, the auricular acupuncture points continued to be stimulated until the needles either fell out or were removed by the researcher. This reduced the number of treatments the participants needed as the needles continue to stimulate the auricular acupuncture points. The participants were taught how to stimulate the auricular acupuncture press needles themselves. The auricular acupuncture semi-permanent press needles needed to be stimulated three times a day.

3.3.2 Homoeopathic Hetero-Isotherapeutic treatment group

The remedies that were utilized in the study were a form of hetero-isotherapy. Participants in the homoeopathic treatment group were each given potentized
medication prepared from the particular brand and strength of cigarette that they smoked.

The homoeopathic isotherapy was prepared by the researcher according to the preparation of *Nicotiana tabacum* in the German Homoeopathic Pharmacopoeia. In the past, studies using hetero-isotherapeutic preparations were made only from the specific brand and strength of cigarette smoked by the patient. Only the shredded tobacco was used and all filters and paper were removed before preparation of the mother tincture. (de la Rouviere, 1996)

For this study, the participants were required to half smoke five cigarettes. These five cigarettes were then collected by the researcher on the first day of the first week of the trial, and used to produce the hetero-isotherapeutic. Filters, paper and ash were all incorporated into the preparation of the mother tincture. As the cigarette is smoked and not ingested, it is felt by incorporating the above, it will increase the effectiveness of the remedy by making it more specific to the condition. Once the mother tincture was produced, it was potentized up to a 9CH. The 9CH potency was dispensed to the participants in 20% alcohol.

The participants were instructed on how to take the medication orally. The medicines were not to be taken with food or drink, and were to be stored away from direct sunlight or intense heat. Camphor products (e.g. Vicks®) were to be avoided during the period of treatment to prevent antidoting the remedies (Clarke, 1925). One dose was to be taken three times daily. The participants were supplied with the necessary amount of medicine to last four weeks.

### 3.3.2.1 Manufacture of *Nicotiana Tabacum*

Preparation of the mother tincture from coarsely powdered drug and liquid dilutions by method 4a (Appendix 7), using ethanol 62 per cent. (German Homoeopathic Pharmacopoeia, 1991)
3.3.2.2 Modifications made to Method 4a

For this study, the participants were required to half smoke five cigarettes. These five cigarettes were then collected by the researcher on the first day of the first week of the trial, and used to produce the mother tincture. Filters, paper and ash were all incorporated into the preparation of the mother tincture. As the cigarette is smoked and not ingested, it is felt by incorporating the above, it will increase the effectiveness of the remedy by making it more specific to the condition. For the last potentization (9CH), the 8th centesimal dilution is added to ethanol of 20 per cent concentration as the remedy is prescribed for oral use.

3.4 MEASUREMENT TECHNIQUES

3.4.1 Daily smoking log (Appendix 6)

Each participant was supplied with six copies of the daily smoking log at the initial consultation. This supplied enough copies for the entire length of the study.

Each copy of the daily smoking log was enough to last one week. The participants name and the sequential dates were filled in on each copy of the daily smoking log.

The daily smoking log was used as a basis for monitoring the number of cigarettes smoked during the initial one-week trial period for both the auricular acupuncture treatment group and the homoeopathic treatment group. If participants had stopped smoking from the start of the treatment the logs remained blank. If the subjects continued to smoke, even at a reduced rate, each cigarette smoked was recorded on the log.
3.4.2 Tolerance dependence questionnaires (Appendix 2)

(The Fagerstrom test for Nicotine dependence)

The Tolerance Dependence Questionnaire is the Fagerstrom test for Nicotine dependence, formulated by Fagerstrom in 1978 and modified in 1991 (Tang et al., 1994). It consists of a series of Questions with a maximum score of 10 points.

Research has found that there is a general correlation between the level of dependence as determined by the American Psychiatric Associations criteria for nicotine dependence, scores on the Fagerstrom test, and the probable severity of withdrawal symptoms, degree of difficulty in achieving abstinence, and speed of relapse. (Henningfield, 1995)

A high score indicates considerable pharmacological tolerance to and dependence on nicotine (Goldstein, 1988:140). Scores of more than 6 points are generally associated with more severe withdrawal symptoms and greater difficulty in smoking cessation (Henningfield, 1995).

3.4.3 Questionnaire on types of smokers (Appendix 3)

The questionnaire on ‘Types of Smoking’ was derived by Horn and Waingrow in 1969 (Goldstein, 1988:140). It is intended to distinguish smokers according to their main reason for smoking.

Three types of smokers are distinguished:

1.) The positive affect smoker (Those who obtain pleasure relaxation or stimulation from cigarette).

2.) The reduction of negative affect smoker (Those for whom cigarettes relieve tension, anxiety, hostility, and depression).
3.) **The habitual addictive smoker** (Those with a predominantly addictive mode of smoking, with a good deal of automatic smoking behaviour).

The Questionnaire consists of 23 questions with graded answers ranging:

- Never = 1 point
- Seldom = 2 points
- Occasionally = 3 points
- Frequently = 4 points
- Always = 5 points

Various questions are allocated to the different types of smokers and the scores are totalled and then averaged. Three scores are obtained; the category with the highest average score is regarded as indicating the respondent's main reason for smoking.

The reoccurrence of smoking relapses after periods of abstinence, and the most common reason for the prevention of smoking cessation is the reduction of negative affect that people obtain from smoking. (Glassman *et al*, 1990)

### 3.5 STATISTICS

The numerical data obtained from the various tasks and observation scales were statistically analysed by a senior statistician and Microsoft Excel 2000 was used for spread sheets and constructing graphs.

The Mann-Whitney U test was used to determine the statistical difference between the two groups, before treatment and after treatment. The Wilcoxon sign rank test was used to determine the effectiveness of the treatment by comparing values before and after treatment. This test was run for the homoeopathic hetero-isotherapeutic group, the auricular acupuncture group and the two groups combined.
The alpha value of significance was set at 0.05 ($\alpha = 0.05$). The null hypothesis was that there would be no difference between the two groups at the end of the study. If the statistical values were to be greater than 0.01, the null hypothesis would be accepted, and this would mean that a significant difference existed between the two groups.
4 CHAPTER FOUR – THE RESULTS

4.1 INTRODUCTION

All the primary data was obtained by the researcher over a six-week period. The data comprised the participant's daily smoking logs, and the questionnaires which were completed under the researcher's supervision.

4.2 DAILY SMOKING LOG (Appendix 6)

The format of the smoking log was adapted and abbreviated from de la Rouviere (1995).

The participants began the daily smoking log the day after the initial consultation. For the week prior to the initial treatment, the participants either ticked or made a cross over the relevant number on the log each time they smoked a cigarette. If the participants smoked more cigarettes than were allocated on the log, they were instructed to write the number of cigarettes smoked that day next to the appropriate log.

The number of cigarettes smoked each day over this period was totalled and the mean was calculated for the average weekly cigarette consumption for each participant both in the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic group (Table 4.1; Figure 2).
Table 4.1 Subject characteristics on entry into the study

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Auricular Acupuncture (n = 30)</th>
<th>Homoeopathic Hetero-isotherapeutic (n = 30)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard deviation</td>
<td>Standard deviation</td>
</tr>
<tr>
<td>Number of Males</td>
<td>13 (43%)</td>
<td>19 (63%)</td>
</tr>
<tr>
<td>Number of Females</td>
<td>17 (57%)</td>
<td>11 (37%)</td>
</tr>
<tr>
<td>Mean Age (Years)</td>
<td>44.3</td>
<td>34.6</td>
</tr>
<tr>
<td>Mean years smoking</td>
<td>24.4</td>
<td>19</td>
</tr>
<tr>
<td>Mean number cigarettes smoked daily</td>
<td>21.6</td>
<td>22.2</td>
</tr>
<tr>
<td>Mean nicotine content (mg)</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Mean tar content</td>
<td>10.4</td>
<td>10.5</td>
</tr>
</tbody>
</table>

The Mann-Whitney U test was used to test whether the median number of cigarettes smoked daily was the same for the two groups before treatment commenced. A two-sided alternative was used (They smoked the same number of cigarettes or they did not smoke the same number of cigarettes). The null hypothesis was that the subjects in the two groups had the same daily cigarette consumption before treatment (Table 4.1).

The calculated value for the exceedance probability (z) was 0.5636 which was > 0.05. The null hypothesis was therefore not rejected at a 5% level of significance. The two groups therefore smoked the same number of cigarettes before treatment.

All participants were supplied with daily smoking logs for the one week trial period following treatment. If they abstained from smoking after treatment the logs remained blank.

After the last day of the study the mean daily cigarette consumption of the participants over the entire 6-week period was calculated for both the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic treatment group. The results of these calculations are represented in Figure 2, Figure 3 and Table 4.2.
Table 4.2 Mean number of cigarettes smoked daily at the end of the 1-week trial period following the end of treatment.

<table>
<thead>
<tr>
<th></th>
<th>Auricular Acupuncture (n = 30)</th>
<th>Homoeopathic hetero-isotherapeutic (n = 30)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard deviation</td>
<td>Standard deviation</td>
</tr>
<tr>
<td>Mean number of cigarettes</td>
<td>13.0</td>
<td>10.0</td>
</tr>
<tr>
<td>smoked daily following the 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>week trial period after</td>
<td>11.5</td>
<td>13.1</td>
</tr>
<tr>
<td>treatment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Mann-Whitney U test was also used to test whether the median number of cigarettes smoked daily was the same for the two groups after treatment. A two-sided alternative was used (They smoked the same number of cigarettes or they did not smoke the same number of cigarettes). The null hypothesis was that the subjects in the two groups had the same daily cigarette consumption after treatment (Table 4.2).

The calculated value for the exceedance probability (z) was 0.8554 which was > 0.05. The null hypothesis was therefore not rejected at a 5% level of significance. The two groups therefore smoked the same number of cigarettes after treatment.
Figure 2 Comparison of the Daily cigarette consumption of the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic treatment group before and after treatment.

This figure compares the mean daily number of cigarettes smoked by the auricular acupuncture group and homoeopathic hetero-isotherapeutic group before and after treatment, as recorded in the daily smoking logs over the 6-week study period.

Thirty participants received auricular acupuncture treatment. This treatment group consisted of 13 men and 17 women. Five participants quit smoking after treatment and remained abstinent for the remainder of the study. The other 25 participants continued to smoke at some stage during the 6-week study. Daily cigarette consumption was recorded by these subjects in their daily smoking logs. Periods of abstinence or reduction of daily cigarette consumption were therefore reflected in the logs. The auricular acupuncture treatment group therefore resulted in a 16.7% smoking cessation rate.
The Wilcoxon signed rank test was used to test the null hypothesis. The null hypothesis states there will NOT be a decrease in the number of cigarettes smoked by participants in the auricular acupuncture group after treatment. As the probability of not rejecting the null hypothesis was very close to zero, the null hypothesis was therefore rejected concluding that week 1 and week 6 had significantly different cigarette consumptions. The auricular acupuncture treatment was effective with a significant difference between the number of cigarettes smoked before and after auricular acupuncture treatment, at a 5% level of significance (α = 0.05).

Thirty participants received homoeopathic hetero-isotherapeutic treatment. This treatment group consisted of 19 men and 11 women. Six participants quit smoking after treatment and remained abstinent for the remainder of the study. The other 24 participants continued to smoke at some stage during the 6-week study. Daily cigarette consumption was recorded by the subjects in their daily smoking logs. Periods of abstinence or reduction of daily cigarette consumption were therefore reflected in the logs. The auricular acupuncture treatment group therefore resulted in a 20% smoking cessation rate.

The Wilcoxon signed rank test was used to test the null hypothesis. The null hypothesis states there will NOT be a decrease in the number of cigarettes smoked by participants in the homoeopathic hetero-isotherapeutic group after treatment. As the probability of not rejecting the null hypothesis was very close to zero, the null hypothesis was therefore rejected concluding that week 1 and week 6 had significantly different cigarette consumptions. The homoeopathic hetero-isotherapeutic treatment was effective with a significant difference between the number of cigarettes smoked before and after homoeopathic hetero-isotherapeutic treatment, at a 5% level of significance (α = 0.05).
COMPARISON OF CIGARETTE CONSUMPTION FOR BOTH GROUPS USING MEDIAN DAILY CONSUMPTION VALUES FROM THE END OF EACH WEEK OF THE STUDY

Figure 3 Comparison of the Daily cigarette consumption of the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic treatment group for all 6 weeks of the study.

This figure show a comparison of the daily cigarette consumption of the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic treatment group for all 6 weeks of the study. From the figure it could be inferred auricular acupuncture treatment has the effect of decreasing the cigarette consumption at a faster rate than homoeopathic hetero-isotherapeutic treatment, but when treatment ceases (at the end of the 5th week), cigarette consumption increases quite rapidly in comparison to the homoeopathic hetero-isotherapeutic treatment group.
4.3 TOLERANCE DEPENDENCE QUESTIONNAIRES (Appendix 2)

The subjects in both the auricular acupuncture treatment group and the homoeopathic treatment group completed the Fagerstrom Test for nicotine dependence. The minimum score for this test is 1 and the maximum score is 10. A high score (greater than six) shows considerable pharmacological dependence. (Goldstein, 1988)

One participant from the auricular acupuncture treatment group was paired with one participant from the homoeopathic hetero-isotherapeutic treatment group according to similar scores on the Fagerstrom Test for nicotine dependence.

Figure 4 shows the distribution of scores obtained by the subjects in the auricular acupuncture and the homoeopathic hetero-isotherapeutic treatment groups in the Tolerance Dependence Questionnaire, before treatment commenced.

A zero score for either group in a particular category is shown as a blank on the graph.

The graph shows that a greater number of participants from the homoeopathic hetero-isotherapeutic treatment group achieved a score of 6 or over, indicating a greater dependence on and tolerance to nicotine.
Figure 4 Comparison of scores obtained in the Tolerance Dependence Questionnaire by subjects in the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic treatment group.

4.4 QUESTIONNAIRES ON TYPES OF SMOKERS (Appendix 3)

Participants in both the auricular acupuncture and homoeopathic hetero-isotherapeutic treatment groups completed a questionnaire on types of smokers. Three types of smokers were distinguished by this questionnaire according to their main reasons for smoking:

1.) Habitual addictive
2.) Reduction of negative effect
3.) Positive effect
Each category had a possible maximum average score of five, and an average minimum score of one. A high score indicates a greater tendency to smoke for that particular reason (Figures 5, 6 and 7).

A zero score for either group in a particular category is indicated as a blank on the graph.

4.4.1 Habitual addictive

**Figure 5** Comparison of scores obtained in the Tolerance Dependence Questionnaire by subjects in the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic treatment group.

The distribution of scoring between the two groups shows a greater tendency for the participants in the auricular acupuncture treatment group to smoke out of habit.
4.4.2 Reduction of Negative affect

![Histogram of Negative Effect](image)

**Figure 6** Comparison of the scores obtained in the Reduction of Negative affect category by the subjects in the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic group.

The distribution of scoring between the two groups shows a greater tendency for the participants in the auricular acupuncture treatment group to smoke in order to reduce negative affect.
4.4.3 Positive affect

**Figure 7** Comparison of the scores obtained in the Positive affect category by the subjects in the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic group.

The graph shows that there is little difference between the scoring of the two groups in the desire to smoke for pleasure or positive affect.
5 CHAPTER FIVE – DISCUSSION

The study was designed to evaluate and compare the efficacy of auricular acupuncture treatment with that of a homoeopathic hetero-isotherapeutic treatment in smoking cessation.

5.1 DAILY SMOKING LOG (Appendix 6)

The daily smoking logs provided the principal data used to calculate the efficacy of each form of treatment and to provide a basis of comparison between the groups. The logs provided a self-reported quantification of the number of cigarettes smoked each day.

The results showed that there was no significant statistical difference between the median daily cigarette consumption by the subjects in the auricular acupuncture or homoeopathic hetero-isotherapeutic treatment groups prior to treatment. This meant that any change in cigarette consumption subsequent to treatment could be statistically evaluated, and an association would exist between the results and the method of treatment.

5.1.1 Auricular Acupuncture treatment group

The results showed that there was a significant decrease in the number of cigarettes smoked by the subjects of the auricular acupuncture group at the end of the 6 weeks, when compared to cigarette consumption of the same group prior to treatment. The auricular acupuncture treatment was therefore effective in smoking cessation.
The overall cessation rate was 16.7% for the auricular acupuncture treatment group. The mean change in cigarette consumption before and after treatment is presented in Figure 2.

The auricular acupuncture cessation rate of 16.7% is lower than the average acupuncture cessation rate of approximately 33% as reviewed by de la Rouviere, (1996).

Fuller (1982) reported a 41% success rate at 6 months after 3 sessions of auricular and electro-acupuncture treatment. He concluded that although 85% of his participants reported easing of withdrawal symptoms, relapses would still occur if motivation is weak.

A study comparing auricular acupuncture and group therapy, reported a large drop out rate from the group therapy and an 11% success rate at 3 months using auricular acupuncture. (Gillams, Lewith, and Machin, 1984)

Fuller (1982) suggests that acupuncture at any site causes endorphin release which in turn alleviates the symptoms of smoking withdrawal.

5.1.2 Homoeopathic hetero-isotherapeutic group

The results showed that there was a significant decrease in the number of cigarettes smoked by the subjects of the homoeopathic hetero-isotherapeutic group at the end of the 6 weeks, when compared to cigarette consumption of the same group prior to treatment. The homoeopathic hetero-isotherapeutic treatment was therefore effective in smoking cessation.

The overall cessation rate was 20% for the homoeopathic hetero-isotherapeutic treatment group. The mean change in cigarette consumption before and after treatment is presented in Figure 2.
No studies have been traced which use homoeopathic treatment exclusively in smoking cessation. A French study included the use of homoeopathic remedies as adjunctive therapy to acupuncture and orthodox medical treatments (Labadie et al., 1983). Tabacum 5CH was given to all participants to reduce the desire for cigarettes, while Nux Vom 12CH was prescribed to alleviate nervousness and anxiety during withdrawal. This study had an overall cessation at one year of 31.1%.

The homoeopathic treatment of the present study was limited to one homoeopathic hetero-isotherapeutic remedy (in 9CH potency) per participant for the duration of the study, and a cessation rate of 20% was attained within this group. These results are satisfactory as they were achieved within the restricted conditions of the study. In practice a variety of remedies in various potencies could be prescribed according to the individual participant and the progression of their withdrawal symptoms.

Both homoeopathic hetero-isotherapeutic treatment and auricular acupuncture treatment were shown to independently result in significantly reduced mean daily cigarette consumption over the study period. The combination of the two treatment forms in practice could lead to a reinforcement of the effects of each form of treatment. This could result in an even more affective method of assisting in smoking cessation.

5.1.3 Factors affecting cessation – Comparison between the Auricular Acupuncture treatment group and the Homoeopathic hetero-isotherapeutic treatment group

Although there was no significant statistical difference between the cigarette consumption of the participants of the two groups before treatment, several other factors may have influenced smoking cessation.
5.1.3.1 Age

Reports regarding the effects of age on motivation to quit smoking have been contradictory. Orleans, Jepson, Resch and Rimer (1994) stated that older smokers (50-74) were far less likely to accept smoking health hazards and more likely to view smoking as beneficial to coping and weight control tactics. Cummings (1994) reported that cessation rates were higher and the percentage of non-smokers greater among persons older than 55 years of age. He also suggested that older persons understood the health consequences of tobacco use best of all, as although most had started smoking as teenagers, life-threatening health consequences were not evident until the 5th or 6th decade of life.

The US Surgeon General (1994) issued a report citing the difficulties with recruitment and retention of adolescents in formal cessation programmes. Orleans et al., (1994) found in their study that older smokers (65 years and over) were interested in quitting and would respond to a programme especially tailored to their needs.

Gritz (1994) suggested that smokers making use of assisted methods of cessation would most likely be female, white, older, more educated, have made more than 3 previous attempts to quit, and would smoke more than 25 cigarettes a day.
**MALES: WEEK 1 TO WEEK 6 SCATTER PLOT**

Figure 8 Comparison between the mean daily number of cigarettes smoked in males and age of the male participant.

**FEMALES: WEEK 1 TO WEEK 6 SCATTER PLOT**

Figure 9 Comparison between the mean daily number of cigarettes smoked in females and age of the female participant.
Figure 8 and Figure 9 show the age distribution of the present study. As the graphs reflect, most participants are clustered between 20 and 30 years old. Table 4.1 shows that the auricular acupuncture treatment group had a higher mean age (44.3 years) when compared to the homoeopathic hetero-isotherapeutic treatment group (34.6 years). Out of the 11 participants (auricular acupuncture and homoeopathic hetero-isotherapeutic treatments combine) who managed to cease smoking, 64% were between 20 and 30 years of age. This greater cessation rate could be attributed to the shorter time period these participants had been smoking.

5.1.3.2 Gender

Gritz (1994) reported that the quit ratio in the US was higher among men (51.6%) than among women (44.7%). In the present study 53% of participants were male and 47% of participants were female, and out of the participants who managed to stop smoking 64% were male and 36% were female.

5.1.3.3 Nicotine Dependence

The Fagerstrom test for nicotine dependence is regarded by many researchers as having the greatest correlation with smoking cessation results. A high level of dependence is associated with more severe withdrawal symptoms, greater difficulty in achieving abstinence and quicker rates of relapse. (Sutherland et al., 1992; Russell et al., 1993; Henningfield, 1995; de la Rouviere, 1996).
Figure 10 Comparison between the nicotine content of the cigarette and the participants for each group.

Figure 10 shows the nicotine content of the cigarettes which participants smoked in this study. The auricular acupuncture treatment group has a greater range in values but both groups have an average nicotine content of 0.9mg.

Figure 4 shows that the homoeopathic hetero-isotherapeutic treatment group and the auricular acupuncture treatment group have very similar concentration of scores in the tolerance dependence questionnaire.

5.1.3.4 Willpower

Fuller (1992) concluded that although 85% of his subjects reported an easing of withdrawal symptoms using auricular and electro-acupuncture, relapses would still occur if motivation was weak.
For the present study it was noted that participants who were eager and motivated to stop smoking, did manage to cease smoking. Participants who expected the treatment to motivate them, managed to reduce their daily cigarette consumption but not completely abstain from smoking.

5.1.3.5 Smoking out of habit or for positive affect

The questionnaire on Types of smokers showed an interesting correlation between the two groups. As shown in Figure 7 the spread of subjects smoking out of habit and smoking for positive effect was higher for the auricular acupuncture treatment group in both categories.

5.1.3.6 Smoking for reduction of negative affect

Smoking to reduce negative affect is one of the most common causes of lack of abstinence or frequency of relapse (Glassman et al., 1990). Figure 6 shows the spread of subjects smoking for the reduction of negative effects was very similar.

5.1.3.7 Age of commencement of smoking

A comparison between the auricular acupuncture and the homoeopathic hetero-isotherapeutic treatment group showed that the auricular acupuncture treatment group had a slightly higher age of commencement of smoking (19.6 years and 17.2 years respectively), and that the auricular acupuncture treatment group smoked for a greater mean number of years, but this could be anticipated due to their greater mean age.

The factors affecting cessation varied between the two groups. However, as both groups exhibited positive and negative factors influencing cessation, it would be difficult to associate the results of cessation rates directly with any of the factors.
6 CHAPTER SIX – CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

Both auricular acupuncture treatment and homoeopathic hetero-isotherapeutic treatment were found to be effective in smoking cessation. The overall cessation rate for the homoeopathic hetero-isotherapeutic treatment group was 20% at 6 weeks, while the cessation rate for the auricular acupuncture group was 16.7% over the same period.

Based on the mean cigarette consumption, there was no significant statistical difference between the two treatment groups before treatment began. There was no large variation in scores on the Fagerstrom Tolerance Test between the groups before treatment.

Other factors affecting the cessation rate such as age, sex, variability of types of smokers and nicotine content, show a variety of positive and negative factors between groups. No one factor showed sufficient variation between the groups to affect the outcome of the treatment.

Both the auricular acupuncture treatment group and the homoeopathic hetero-isotherapeutic group showed a significant statistical difference in the number of cigarettes smoked after treatment. The substantial decrease exhibited by both groups was further illustrated by a cessation rate in the homoeopathic hetero-isotherapeutic treatment group of 20% and a cessation rate in the auricular acupuncture treatment group of 16.7%. Although this illustrates a 3.3% difference between the outcomes of the two groups, this did not constitute a significant statistical difference.
Both forms of treatment may therefore be considered to be effective means of assisting in smoking cessation.

6.2 RECOMMENDATIONS

Di Nepi (1990) mentions that isotherapy is often used as a complement to other homoeopathic or conventional treatment forms, especially in chronic conditions, to achieve a better and deeper action. As the homoeopathic hetero-isotherapeutic means of treatment has been shown to be affective in smoking cessation, future studies could incorporate the use of homoeopathic remedies which are commonly used to treat psycho-affective or addictive disorders, to provide a deeper and more complete action. By adding deeper acting homoeopathic remedies one may take into account the whole range of subjective elements such as fears, depressions and anxieties which play a key role in the successful outcome of smoking cessation treatment (Lederman, 1985).

Self reported smoking cessation could be validated at the end of the trial period by a biological marker. The marker most commonly used is the carbon monoxide monitor. Although expensive, it accurately measures the carbon monoxide in exhaled air. A non-smoker has carbon monoxide levels up to 3 ppm (parts per million) while the carbon monoxide levels of smokers range between 10 and 30 ppm, even if the last cigarette was smoked several hours before monitoring (Gordon, 1995). Such studies could also include longer period of abstinence monitoring (1 to 2 years) with smoking cessation only at the end of the trial period being considered as the criterion for efficacy of treatment.
LIST OF REFERENCES


German Homoeopathic Pharmacopoeia, 5th supplement, (1993). Deutsher Apotheker Verlag, Stuttgart, Germany. pg. 31-34, 691-693


Medical Association of South Africa. *Your personal guide to Quitting*. Medical Association of South Africa. pg.20


APPENDICES

1 APPENDIX 1: SUBJECTS INFORMED CONSENT FORM

Participant Informed Consent Document

I have volunteered to participate in a study to evaluate and compare the efficacy of auricular acupuncture treatment and homoeopathic treatment in the cessation of smoking. The research will be of six weeks duration and is to be conducted free of charge.

I understand that I am required to complete questionnaires at each consultation and that the information in the questionnaires will be regarded as strictly confidential and will be used for research purposes only.

I understand that I may withdraw from the study at any time by informing Glenn Ferguson in writing of my desire to do so.

I agree to participate in this study.

______________________________  ______________________________
Name of Participant  Witness
(Please print)

______________________________  ______________________________
Signature  Date
2 APPENDIX 2: QUESTIONNAIRE ON TOLERANCE DEPENDANCE

Questionnaire on Tolerance Dependence

Directions: Fill in the score of the answer to the question in the appropriate score block.

1. How soon after you wake up do you smoke your first cigarette?

<table>
<thead>
<tr>
<th>Score</th>
<th>Within 5 minutes</th>
<th>6 - 30 minutes</th>
<th>31 - 60 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score:</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Do you find it difficult to refrain from smoking in places where it is forbidden? (eg. Church, Cinema, Library, etc.)

<table>
<thead>
<tr>
<th>Score</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

3. Would you give up the first cigarette of the day?

<table>
<thead>
<tr>
<th>Score</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

4. How many cigarettes a day do you smoke?

<table>
<thead>
<tr>
<th>Score</th>
<th>31 or More</th>
<th>21 - 30</th>
<th>11 - 20</th>
<th>10 or Less</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score:</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

5. Do you smoke more frequently during the first hours after waking than during the rest of the day?

<table>
<thead>
<tr>
<th>Score</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

6. Do you smoke if you are so ill that you are in bed most of the day?

<table>
<thead>
<tr>
<th>Score</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Total Score: 

78
3 APPENDIX 3: QUESTIONNAIRE ON TYPES OF SMOKERS

Questionnaire on types of smoking

1. I smoke cigarettes to stimulate me, to perk me up.
   \[
   \begin{array}{cccccc}
   \text{Always} & \text{Frequently} & \text{Occasionally} & \text{Seldom} & \text{Never} \\
   5 & 4 & 3 & 2 & 1 \\
   \end{array}
   \]
   Score: 

2. I’ve found a cigarette in my mouth & didn’t remember putting it there.
   \[
   \begin{array}{cccccc}
   \text{Always} & \text{Frequently} & \text{Occasionally} & \text{Seldom} & \text{Never} \\
   5 & 4 & 3 & 2 & 1 \\
   \end{array}
   \]
   Score: 

3. When I am trying to solve a problem, I light up a cigarette.
   \[
   \begin{array}{cccccc}
   \text{Always} & \text{Frequently} & \text{Occasionally} & \text{Seldom} & \text{Never} \\
   5 & 4 & 3 & 2 & 1 \\
   \end{array}
   \]
   Score: 

4. When I smoke a cigarette, part of the enjoyment is watching the smoke as I exhale it.
   \[
   \begin{array}{cccccc}
   \text{Always} & \text{Frequently} & \text{Occasionally} & \text{Seldom} & \text{Never} \\
   5 & 4 & 3 & 2 & 1 \\
   \end{array}
   \]
   Score: 

5. I am very much aware of the fact when I am smoking or not smoking a cigarette.
   \[
   \begin{array}{cccccc}
   \text{Always} & \text{Frequently} & \text{Occasionally} & \text{Seldom} & \text{Never} \\
   5 & 4 & 3 & 2 & 1 \\
   \end{array}
   \]
   Score: 

6. Part of the enjoyment of smoking a cigarette comes from the steps I take to light up.
   \[
   \begin{array}{cccccc}
   \text{Always} & \text{Frequently} & \text{Occasionally} & \text{Seldom} & \text{Never} \\
   5 & 4 & 3 & 2 & 1 \\
   \end{array}
   \]
   Score: 

7. When I feel “Blue” or want to take my mind off cares & worries, I smoke cigarettes.
   \[
   \begin{array}{cccccc}
   \text{Always} & \text{Frequently} & \text{Occasionally} & \text{Seldom} & \text{Never} \\
   5 & 4 & 3 & 2 & 1 \\
   \end{array}
   \]
   Score: 

8. I smoke cigarettes automatically without even being aware of it.
   \[
   \begin{array}{cccccc}
   \text{Always} & \text{Frequently} & \text{Occasionally} & \text{Seldom} & \text{Never} \\
   5 & 4 & 3 & 2 & 1 \\
   \end{array}
   \]
   Score: 

9. I smoke cigarettes in order to keep myself from slowing down.
   \[
   \begin{array}{cccccc}
   \text{Always} & \text{Frequently} & \text{Occasionally} & \text{Seldom} & \text{Never} \\
   5 & 4 & 3 & 2 & 1 \\
   \end{array}
   \]
   Score:
10. I get real gnawing hunger for a cigarette when I haven't smoked for a while.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: __________

11. When I feel uncomfortable or upset about something, I light up a cigarette.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: __________

12. Handling a cigarette is part of the enjoyment of smoking it.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: __________

13. Between cigarettes, I get a craving that only a cigarette can satisfy.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: __________

14. I light up a cigarette when I feel angry about something.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: __________

15. I light up a cigarette without realizing I still have one burning in the ashtray.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: __________

16. I find cigarettes pleasurable.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: __________

17. When I feel ashamed or embarrassed about something, I light up a cigarette.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: __________

18. When I have run out of cigarettes I find it almost unbearable until I can get them.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: __________

19. Few things help me better than cigarettes when I'm feeling upset.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: __________
20. I smoke cigarettes just from habit, without really even wanting the one I'm smoking.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: [Blank Box]

21. Smoking cigarettes is pleasant & relaxing.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: [Blank Box]

22. I do not feel contented for long unless I am smoking a cigarette.

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: [Blank Box]

23. I smoke cigarettes to give me a "lift".

<table>
<thead>
<tr>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Seldom</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Score: [Blank Box]

Total Score: [Blank Box]
### Methods of scoring

Add scores for items & divide as indicated.

<table>
<thead>
<tr>
<th>Habitual Addictive</th>
<th>Reduction of Negative Affect</th>
<th>Positive Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. ____</td>
<td>3. ____</td>
<td>1. ____</td>
</tr>
<tr>
<td>5. ____</td>
<td>7. ____</td>
<td>4. ____</td>
</tr>
<tr>
<td>8. ____</td>
<td>11. ____</td>
<td>6. ____</td>
</tr>
<tr>
<td>10. ____</td>
<td>14. ____</td>
<td>9. ____</td>
</tr>
<tr>
<td>13. ____</td>
<td>17. ____</td>
<td>12. ____</td>
</tr>
<tr>
<td>15. ____</td>
<td>19. ____</td>
<td>16. ____</td>
</tr>
<tr>
<td>18. ____</td>
<td></td>
<td>21. ____</td>
</tr>
<tr>
<td>20. ____</td>
<td></td>
<td>23. ____</td>
</tr>
<tr>
<td>22. ____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>/ 9</td>
<td>/ 6</td>
</tr>
<tr>
<td>Average Score</td>
<td></td>
<td>/ 8</td>
</tr>
</tbody>
</table>
4 APPENDIX 4: SMOKING HISTORY

Smoking History

Name: ____________________________
Address: ____________________________
Phone no.: ____________________________
Age: ____________________________
Occupation: ____________________________
Married: ____________________________
Children: ____________________________
Allergies: ____________________________

Medical History

Past Surgical History: ____________________________
Past Medical History: ____________________________
Family History: ____________________________
Medication: ____________________________
Sporting activities: ____________________________
Habits: ____________________________

Date: ____________________________
Smoking History

Number of Years:___________________________________________________________
Age of Commencement:_____________________________________________________
Average number of cigarettes smoked daily:____________________________________
Present brand:_____________________________________________________________
Nicotine content:___________________________________________________________
Condensate:_______________________________________________________________
How many times have you tried to give up?____________________________________
What made you start up again?_______________________________________________
Members of your family who smoke:___________________________________________
How many of your friends smoke:_____________________________________________
Do you smoke more at work or in social situations?______________________________
Why do you want to give up smoking?_________________________________________

Physical Exam

Blood Pressure:____________________
Pulse:___________________________
Respiratory rate:__________________
Temperature:______________________
Height:___________________________
Weight:___________________________
Other:______________________________________________________________
Coping with Withdrawal

You may notice a few physical and mood changes after you stop smoking. These will last a few days after quitting and are perfectly normal.

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>REASON FOR SYMPTOM</th>
<th>COPING ACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Craving</td>
<td>Your body is used to getting regular ‘fixes’ of nicotine</td>
<td>The strong urge to smoke usually lasts 2-5 minutes before fading away. Do something to occupy yourself until the feeling passes - Drink water, Deep breaths, etc.</td>
</tr>
<tr>
<td>Light headedness &amp; Loss of concentration</td>
<td>Probably caused by lack of nicotine</td>
<td>Take things more slowly. Don’t push yourself too hard for the next few days. Get regular exercise. Work for short periods &amp; then take a break. Make sure you eat properly.</td>
</tr>
<tr>
<td>Coughing</td>
<td>Your lungs are clearing out the tars and excess mucous</td>
<td>Sip warm water. The coughing will soon clear up by itself.</td>
</tr>
<tr>
<td>Tension, irritability</td>
<td>Low blood nicotine levels</td>
<td>Take a walk, soak in a hot bath, try relaxation techniques. Talk to someone about your feelings.</td>
</tr>
<tr>
<td>Depression</td>
<td>Feeling helpless, incompetent &amp; worthless due to emotional confusion</td>
<td>Modest exercise (a 5 or 10 min. brisk walk) can help lift your mood. Your problems can be solved, just tackle them one by one.</td>
</tr>
<tr>
<td>Hunger</td>
<td>Your body’s metabolism is returning to normal</td>
<td>Eat pop-corn, carrots, prunes &amp; other low calorie snacks. Try to eat 6 small meals a day. Drink lots of water.</td>
</tr>
<tr>
<td>Trouble sleeping</td>
<td></td>
<td>Soak in the bath &amp; have a glass of hot milk before going to bed. If unable to sleep, get up &amp; read - or listen to the radio. Exercise before going to bed can also help.</td>
</tr>
</tbody>
</table>

Other common symptoms: Dry mouth, sore throat, headaches, digestive problems, fatigue, bouts of tearfulness & mouth ulcers.
### Daily Smoking Log

#### Participant number: ____________________________

#### Week: ____________________________

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td>25</td>
<td>26</td>
</tr>
<tr>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>31</td>
<td>32</td>
</tr>
<tr>
<td>33</td>
<td>34</td>
</tr>
<tr>
<td>35</td>
<td>36</td>
</tr>
<tr>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>39</td>
<td>40</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td>25</td>
<td>26</td>
</tr>
<tr>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>31</td>
<td>32</td>
</tr>
<tr>
<td>33</td>
<td>34</td>
</tr>
<tr>
<td>35</td>
<td>36</td>
</tr>
<tr>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>39</td>
<td>40</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td>25</td>
<td>26</td>
</tr>
<tr>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>31</td>
<td>32</td>
</tr>
<tr>
<td>33</td>
<td>34</td>
</tr>
<tr>
<td>35</td>
<td>36</td>
</tr>
<tr>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>39</td>
<td>40</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>23</td>
<td>24</td>
</tr>
<tr>
<td>25</td>
<td>26</td>
</tr>
<tr>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>31</td>
<td>32</td>
</tr>
<tr>
<td>33</td>
<td>34</td>
</tr>
<tr>
<td>35</td>
<td>36</td>
</tr>
<tr>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>39</td>
<td>40</td>
</tr>
</tbody>
</table>

---
Method 4a: Mother tinctures and liquid dilutions

Method 4a is for mother tinctures manufactured according to the maceration or percolation methods described in the TINKTUREN (tinctures) monograph in the German Homoeopathic Pharmacopoeia using 1 part of the drug to 10 parts of ethanol in suitable concentration (unless otherwise stated in the monograph). If adjustment to a given value is necessary, the required amount of ethanol in the concentration prescribed or used for manufacture is calculated according to (Formula 1). The calculated amount of ethanol is combined with the filtrate. The mixture is left to stand for not less than five days at a temperature not exceeding 20 degrees Celsius, after which it is filtered if required. (German Homoeopathic Pharmacopoeia; 1991)

\[
W(N_X - N_O) \\
E_1 = \frac{W(N_X - N_O)}{100} \text{ [kg]}
\]

\(E_1\) = amount of 43 per cent ethanol  
\(W\) = weight of filtrate in kg  
\(N_O\) = dry residue or solid content in per cent as required by the Monograph  
\(N_X\) = dry residue or solid content of filtrate in per cent
Potentization

The mother tincture is equivalent to the first decimal dilution (Tincture = 1x).

The 2\textsuperscript{nd} decimal dilution (2x) is made with:

-1 part of the mother tincture and
-9 parts of ethanol of the same concentration.

The 3\textsuperscript{rd} decimal dilution (3x) with:

-1 part of the 2\textsuperscript{nd} decimal dilution and
-9 parts of ethanol of the same concentration.

Ethanol 43 per cent is used for subsequent dilutions from the 4\textsuperscript{th} decimal upwards unless a different concentration is prescribed; the method is the same as for the 3\textsuperscript{rd} decimal dilution.

The 1\textsuperscript{st} centesimal dilution (1c) with:

-10 parts of the mother tincture and
-90 parts of ethanol of the same concentration.

The 2\textsuperscript{nd} centesimal dilution (2c) with:

-1 part of the first centesimal dilution and
-99 parts of ethanol 43 per cent, unless another concentration is prescribed.

Subsequent dilutions are produced in the same way.
# Appendix 8: Homoeopathic Hetero-Isotherapeutic Group: Raw Data

<table>
<thead>
<tr>
<th>ID No.</th>
<th>Sex</th>
<th>Age No.</th>
<th>Age Comm.</th>
<th>Tol Dep.</th>
<th>Habit.</th>
<th>Neg. effect</th>
<th>Pos. effect</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Nigotine</th>
<th>Tar</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01 F</td>
<td>29</td>
<td>2</td>
<td>28</td>
<td>2</td>
<td>2.1</td>
<td>2.7</td>
<td>2.8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>14</td>
<td>10</td>
<td>10</td>
<td>0.7</td>
<td>8</td>
</tr>
<tr>
<td>A02 F</td>
<td>44</td>
<td>25</td>
<td>19</td>
<td>2</td>
<td>2.3</td>
<td>2.8</td>
<td>2.9</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>0.8</td>
<td>8</td>
</tr>
<tr>
<td>A03 M</td>
<td>26</td>
<td>10</td>
<td>16</td>
<td>2</td>
<td>3.2</td>
<td>3.5</td>
<td>2.5</td>
<td>14</td>
<td>12</td>
<td>9</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>1.1</td>
<td>16</td>
</tr>
<tr>
<td>A04 F</td>
<td>22</td>
<td>2</td>
<td>17</td>
<td>3</td>
<td>1.7</td>
<td>3.5</td>
<td>2.7</td>
<td>19</td>
<td>17</td>
<td>17</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>0.8</td>
<td>9</td>
</tr>
<tr>
<td>A05 M</td>
<td>25</td>
<td>6</td>
<td>20</td>
<td>3</td>
<td>2.6</td>
<td>3</td>
<td>3</td>
<td>10</td>
<td>6</td>
<td>6</td>
<td>0.7</td>
<td></td>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>A06 M</td>
<td>24</td>
<td>11</td>
<td>13</td>
<td>3</td>
<td>1.8</td>
<td>1.5</td>
<td>3.3</td>
<td>5</td>
<td></td>
<td></td>
<td>0.7</td>
<td></td>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>A07 F</td>
<td>30</td>
<td>12</td>
<td>18</td>
<td>3</td>
<td>2.4</td>
<td>3.7</td>
<td>2.3</td>
<td>15</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>A08 M</td>
<td>23</td>
<td>7</td>
<td>16</td>
<td>3</td>
<td>2.1</td>
<td>2.2</td>
<td>1.5</td>
<td>21</td>
<td>17</td>
<td>12</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>0.7</td>
<td>8</td>
</tr>
<tr>
<td>A09 M</td>
<td>21</td>
<td>6</td>
<td>16</td>
<td>4</td>
<td>3.4</td>
<td>3.5</td>
<td>3.9</td>
<td>29</td>
<td>21</td>
<td>17</td>
<td>11</td>
<td>7</td>
<td>7</td>
<td>1.1</td>
<td>16</td>
</tr>
<tr>
<td>A10 F</td>
<td>37</td>
<td>20</td>
<td>17</td>
<td>4</td>
<td>2.9</td>
<td>3.2</td>
<td>2.8</td>
<td>40</td>
<td>26</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>19</td>
<td>1.4</td>
<td>20</td>
</tr>
<tr>
<td>A11 M</td>
<td>52</td>
<td>36</td>
<td>16</td>
<td>4</td>
<td>3.2</td>
<td>3.8</td>
<td>3.1</td>
<td>23</td>
<td>24</td>
<td>22</td>
<td>25</td>
<td>23</td>
<td>22</td>
<td>0.8</td>
<td>9</td>
</tr>
<tr>
<td>A12 M</td>
<td>25</td>
<td>11</td>
<td>14</td>
<td>4</td>
<td>1.7</td>
<td>1.7</td>
<td>1</td>
<td>17</td>
<td>15</td>
<td>12</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>A13 F</td>
<td>18</td>
<td>3</td>
<td>15</td>
<td>4</td>
<td>2.2</td>
<td>2.7</td>
<td>2.3</td>
<td>15</td>
<td>7</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>0.8</td>
<td>9</td>
</tr>
<tr>
<td>A14 M</td>
<td>60</td>
<td>44</td>
<td>16</td>
<td>5</td>
<td>1.4</td>
<td>1.5</td>
<td>2.1</td>
<td>22</td>
<td>18</td>
<td>20</td>
<td>19</td>
<td>21</td>
<td>20</td>
<td>0.8</td>
<td>9</td>
</tr>
<tr>
<td>A15 M</td>
<td>27</td>
<td>13</td>
<td>14</td>
<td>5</td>
<td>3.3</td>
<td>3.8</td>
<td>3.1</td>
<td>8</td>
<td>14</td>
<td>13</td>
<td>15</td>
<td>13</td>
<td>14</td>
<td>0.8</td>
<td>9</td>
</tr>
<tr>
<td>A16 M</td>
<td>24</td>
<td>12</td>
<td>12</td>
<td>5</td>
<td>2.9</td>
<td>3.5</td>
<td>2.9</td>
<td>20</td>
<td>22</td>
<td>14</td>
<td>10</td>
<td>8</td>
<td>8</td>
<td>0.7</td>
<td>7</td>
</tr>
<tr>
<td>A17 F</td>
<td>50</td>
<td>30</td>
<td>21</td>
<td>6</td>
<td>4.2</td>
<td>4.7</td>
<td>4.1</td>
<td>28</td>
<td>22</td>
<td>17</td>
<td>13</td>
<td>9</td>
<td>7</td>
<td>0.8</td>
<td>9</td>
</tr>
<tr>
<td>A18 M</td>
<td>37</td>
<td>11</td>
<td>26</td>
<td>6</td>
<td>2.2</td>
<td>3</td>
<td>3.1</td>
<td>25</td>
<td>20</td>
<td>19</td>
<td>16</td>
<td>16</td>
<td>19</td>
<td>0.7</td>
<td>7</td>
</tr>
<tr>
<td>A19 M</td>
<td>31</td>
<td>21</td>
<td>10</td>
<td>6</td>
<td>2.6</td>
<td>1.8</td>
<td>2.4</td>
<td>12</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>1.3</td>
<td>6</td>
</tr>
<tr>
<td>A20 M</td>
<td>35</td>
<td>17</td>
<td>18</td>
<td>6</td>
<td>3</td>
<td>3.7</td>
<td>3.6</td>
<td>24</td>
<td>19</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>0.7</td>
<td>8</td>
</tr>
<tr>
<td>A21 M</td>
<td>26</td>
<td>6</td>
<td>20</td>
<td>6</td>
<td>2.7</td>
<td>3.8</td>
<td>2.9</td>
<td>17</td>
<td>9</td>
<td>9</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>1.1</td>
<td>11</td>
</tr>
<tr>
<td>A22 F</td>
<td>19</td>
<td>2</td>
<td>17</td>
<td>6</td>
<td>2.7</td>
<td>3</td>
<td>2.5</td>
<td>22</td>
<td>15</td>
<td>17</td>
<td>16</td>
<td>13</td>
<td>13</td>
<td>0.9</td>
<td>10</td>
</tr>
<tr>
<td>A23 M</td>
<td>61</td>
<td>40</td>
<td>18</td>
<td>7</td>
<td>4.1</td>
<td>4.2</td>
<td>2.5</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>0.4</td>
<td>15</td>
</tr>
<tr>
<td>A24 F</td>
<td>45</td>
<td>30</td>
<td>15</td>
<td>7</td>
<td>3.6</td>
<td>4.7</td>
<td>2</td>
<td>25</td>
<td></td>
<td></td>
<td>1.4</td>
<td></td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>A25 F</td>
<td>38</td>
<td>24</td>
<td>14</td>
<td>7</td>
<td>3.9</td>
<td>4.8</td>
<td>3.3</td>
<td>37</td>
<td>26</td>
<td>20</td>
<td>21</td>
<td>19</td>
<td>21</td>
<td>1.5</td>
<td>15</td>
</tr>
<tr>
<td>A26 M</td>
<td>48</td>
<td>24</td>
<td>24</td>
<td>7</td>
<td>3.9</td>
<td>4</td>
<td>1.8</td>
<td>40</td>
<td>26</td>
<td>27</td>
<td>31</td>
<td>24</td>
<td>18</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>A27 M</td>
<td>21</td>
<td>8</td>
<td>13</td>
<td>7</td>
<td>3.7</td>
<td>4.7</td>
<td>3</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>A28 M</td>
<td>56</td>
<td>31</td>
<td>24</td>
<td>7</td>
<td>3.1</td>
<td>3.7</td>
<td>1.5</td>
<td>26</td>
<td>20</td>
<td>16</td>
<td>9</td>
<td>7</td>
<td>7</td>
<td>0.8</td>
<td>9</td>
</tr>
<tr>
<td>A29 M</td>
<td>45</td>
<td>30</td>
<td>15</td>
<td>8</td>
<td>3.4</td>
<td>4</td>
<td>3.3</td>
<td>25</td>
<td>26</td>
<td>25</td>
<td>24</td>
<td>26</td>
<td>24</td>
<td>1.4</td>
<td>15</td>
</tr>
<tr>
<td>A30 F</td>
<td>39</td>
<td>24</td>
<td>15</td>
<td>9</td>
<td>4.2</td>
<td>5</td>
<td>3.5</td>
<td>37</td>
<td>38</td>
<td>35</td>
<td>37</td>
<td>36</td>
<td>37</td>
<td>0.5</td>
<td>5</td>
</tr>
</tbody>
</table>
## APPENDIX 9: AURICULAR ACUPUNCTURE GROUP:

### RAW DATA

<table>
<thead>
<tr>
<th>ID. No.</th>
<th>Sex</th>
<th>Age</th>
<th>No. Year</th>
<th>Age Comm.</th>
<th>Tol. Dep.</th>
<th>Habit.</th>
<th>Neg. effect</th>
<th>Pos. effect</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
<th>Week 6</th>
<th>Nicotine</th>
<th>Tar</th>
</tr>
</thead>
<tbody>
<tr>
<td>B01</td>
<td>F</td>
<td>24</td>
<td>7</td>
<td>17</td>
<td>2</td>
<td>2.4</td>
<td>4.1</td>
<td>2.5</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>0.7</td>
<td>8</td>
</tr>
<tr>
<td>B02</td>
<td>M</td>
<td>24</td>
<td>4</td>
<td>20</td>
<td>2</td>
<td>2.3</td>
<td>2.8</td>
<td>2.8</td>
<td>7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>8</td>
</tr>
<tr>
<td>B03</td>
<td>F</td>
<td>82</td>
<td>60</td>
<td>20</td>
<td>3</td>
<td>2.3</td>
<td>3.8</td>
<td>3.1</td>
<td>10</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>0.1</td>
<td>1</td>
</tr>
<tr>
<td>B04</td>
<td>M</td>
<td>62</td>
<td>45</td>
<td>16</td>
<td>3</td>
<td>2.9</td>
<td>4.3</td>
<td>2.1</td>
<td>5</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>1</td>
</tr>
<tr>
<td>B05</td>
<td>F</td>
<td>57</td>
<td>10</td>
<td>47</td>
<td>3</td>
<td>2.3</td>
<td>4.7</td>
<td>2.9</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>1.4</td>
<td>15</td>
</tr>
<tr>
<td>B06</td>
<td>M</td>
<td>20</td>
<td>5</td>
<td>15</td>
<td>3</td>
<td>4.1</td>
<td>4.2</td>
<td>4.3</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>1.4</td>
<td>15</td>
</tr>
<tr>
<td>B07</td>
<td>F</td>
<td>23</td>
<td>5</td>
<td>18</td>
<td>3</td>
<td>1.7</td>
<td>3.3</td>
<td>2.8</td>
<td>10</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>8</td>
</tr>
<tr>
<td>B08</td>
<td>F</td>
<td>27</td>
<td>12</td>
<td>16</td>
<td>4</td>
<td>3.1</td>
<td>4.7</td>
<td>3.5</td>
<td>25</td>
<td>9</td>
<td>14</td>
<td>12</td>
<td>11</td>
<td>9</td>
<td>0.1</td>
<td>1</td>
</tr>
<tr>
<td>B09</td>
<td>M</td>
<td>30</td>
<td>5</td>
<td>25</td>
<td>4</td>
<td>2.8</td>
<td>3.5</td>
<td>3.4</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>0.1</td>
<td>1</td>
</tr>
<tr>
<td>B10</td>
<td>F</td>
<td>32</td>
<td>2</td>
<td>30</td>
<td>4</td>
<td>2.4</td>
<td>3.3</td>
<td>2.3</td>
<td>18</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td>0.4</td>
<td>4</td>
</tr>
<tr>
<td>B11</td>
<td>M</td>
<td>55</td>
<td>31</td>
<td>15</td>
<td>4</td>
<td>2.7</td>
<td>4</td>
<td>2</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>1.2</td>
<td>14</td>
</tr>
<tr>
<td>B12</td>
<td>F</td>
<td>38</td>
<td>9</td>
<td>29</td>
<td>5</td>
<td>3</td>
<td>3.8</td>
<td>3</td>
<td>25</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>11</td>
<td>15</td>
<td>20</td>
<td>0.7</td>
</tr>
<tr>
<td>B13</td>
<td>F</td>
<td>32</td>
<td>17</td>
<td>15</td>
<td>5</td>
<td>3.7</td>
<td>4.5</td>
<td>3.8</td>
<td>10</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>1.1</td>
<td>11</td>
</tr>
<tr>
<td>B14</td>
<td>F</td>
<td>29</td>
<td>10</td>
<td>19</td>
<td>5</td>
<td>1.7</td>
<td>3.1</td>
<td>2.5</td>
<td>25</td>
<td>18</td>
<td>16</td>
<td>11</td>
<td>13</td>
<td>10</td>
<td>0.7</td>
<td>7</td>
</tr>
<tr>
<td>B15</td>
<td>F</td>
<td>26</td>
<td>9</td>
<td>18</td>
<td>5</td>
<td>2.6</td>
<td>3.6</td>
<td>2.7</td>
<td>17</td>
<td>15</td>
<td>14</td>
<td>17</td>
<td>19</td>
<td>1</td>
<td>1.1</td>
<td>11</td>
</tr>
<tr>
<td>B16</td>
<td>M</td>
<td>57</td>
<td>44</td>
<td>13</td>
<td>5</td>
<td>1.8</td>
<td>2.2</td>
<td>1.5</td>
<td>18</td>
<td>15</td>
<td>16</td>
<td>16</td>
<td>15</td>
<td>13</td>
<td>1.5</td>
<td>18</td>
</tr>
<tr>
<td>B17</td>
<td>M</td>
<td>23</td>
<td>5</td>
<td>18</td>
<td>5</td>
<td>2.9</td>
<td>3.3</td>
<td>3.6</td>
<td>20</td>
<td>15</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>1.1</td>
<td>16</td>
</tr>
<tr>
<td>B18</td>
<td>F</td>
<td>67</td>
<td>46</td>
<td>21</td>
<td>6</td>
<td>2.6</td>
<td>2</td>
<td>1.7</td>
<td>40</td>
<td>40</td>
<td>30</td>
<td>30</td>
<td>20</td>
<td>20</td>
<td>0.6</td>
<td>9</td>
</tr>
<tr>
<td>B19</td>
<td>M</td>
<td>27</td>
<td>11</td>
<td>16</td>
<td>6</td>
<td>2.2</td>
<td>2.3</td>
<td>2.1</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>1.1</td>
<td>16</td>
</tr>
<tr>
<td>B20</td>
<td>F</td>
<td>70</td>
<td>50</td>
<td>20</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>15</td>
<td>14</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>B21</td>
<td>M</td>
<td>37</td>
<td>21</td>
<td>16</td>
<td>7</td>
<td>2.1</td>
<td>2.8</td>
<td>2.1</td>
<td>41</td>
<td>34</td>
<td>21</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>1.2</td>
<td>14</td>
</tr>
<tr>
<td>B22</td>
<td>F</td>
<td>69</td>
<td>53</td>
<td>16</td>
<td>7</td>
<td>3</td>
<td>4.7</td>
<td>1.9</td>
<td>25</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>1.2</td>
<td>14</td>
</tr>
<tr>
<td>B23</td>
<td>F</td>
<td>76</td>
<td>52</td>
<td>24</td>
<td>7</td>
<td>2.6</td>
<td>3.2</td>
<td>2.5</td>
<td>50</td>
<td>25</td>
<td>24</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>0.5</td>
<td>5</td>
</tr>
<tr>
<td>B24</td>
<td>F</td>
<td>73</td>
<td>55</td>
<td>18</td>
<td>7</td>
<td>3.4</td>
<td>4.5</td>
<td>3</td>
<td>25</td>
<td>21</td>
<td>14</td>
<td>20</td>
<td>21</td>
<td>18</td>
<td>1.4</td>
<td>15</td>
</tr>
<tr>
<td>B25</td>
<td>M</td>
<td>50</td>
<td>28</td>
<td>22</td>
<td>7</td>
<td>3.6</td>
<td>4.2</td>
<td>2.5</td>
<td>30</td>
<td>18</td>
<td>27</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>1.4</td>
<td>20</td>
</tr>
<tr>
<td>B26</td>
<td>M</td>
<td>53</td>
<td>37</td>
<td>17</td>
<td>7</td>
<td>2.7</td>
<td>4.8</td>
<td>2.1</td>
<td>40</td>
<td>33</td>
<td>40</td>
<td>31</td>
<td>40</td>
<td>40</td>
<td>1.4</td>
<td>20</td>
</tr>
<tr>
<td>B27</td>
<td>M</td>
<td>27</td>
<td>11</td>
<td>16</td>
<td>8</td>
<td>2.8</td>
<td>2.2</td>
<td>2.5</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>1.1</td>
<td>16</td>
</tr>
<tr>
<td>B28</td>
<td>F</td>
<td>33</td>
<td>16</td>
<td>17</td>
<td>8</td>
<td>3.3</td>
<td>5</td>
<td>3.5</td>
<td>37</td>
<td>27</td>
<td>23</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>0.7</td>
<td>8</td>
</tr>
<tr>
<td>B29</td>
<td>F</td>
<td>54</td>
<td>32</td>
<td>22</td>
<td>8</td>
<td>2.9</td>
<td>4</td>
<td>3.4</td>
<td>35</td>
<td>33</td>
<td>30</td>
<td>24</td>
<td>24</td>
<td>25</td>
<td>0.8</td>
<td>9</td>
</tr>
<tr>
<td>B30</td>
<td>M</td>
<td>51</td>
<td>40</td>
<td>12</td>
<td>9</td>
<td>4.3</td>
<td>4.2</td>
<td>2</td>
<td>26</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>16</td>
<td>23</td>
<td>1.4</td>
<td>15</td>
</tr>
</tbody>
</table>