# ENVIRONMENTAL POLLUTION AND ITS EFFECTS ON CARDIOPULMONARY, RENAL AND CENTRAL NERVOUS SYSTEMS IN CHILDREN

### Essay

Submitted In Partial Fulfilment for Requirement of the Master Degree

In

Pediatrics

Presented by

### Lamiaa Mohamed Medhat Dabbouse

M.B.B.Ch. (1992), Ain Shams University

L - M

### SUPERVISED BY

### Prof. Dr. HAMED MAHMOOD SHATLA

Professor of Pediatrics & Dean of Faculty of Medicine Ain Shams University

### Dr. HANAN MOSTAFA EL SHAKANKIRY

Lecturer in Pediatrics
Faculty of Medicine - Ain Shams University



1997



# بسم الله الرحمن الرحيم

# ACKNOWLEDGEMENT

My deep gratitudes are forwarded to God.

My thanks and great appreciation are owe to Professor DR.. HAMED MAHMOOD SHATLA,
Professor of Pediatrics and Dean of Faculty of
Medicine, Ain-Shams University, for great endless help
and hind advice.

I wish to thanh DR. HANAN MOSTAFA EL SHAKANKIRY, Lecturer in Pediatrics, Faculty of Medicine, Ain- Shams University, for her continuous support and guidance, valuable suggestions, expert advice and generous help which have helped me greatly in the completion of this work.



### CONTENTS Page List of Abreviations List of Figures List of Tables INTRODUCTION AND AIM OF WORK 1 REVIEW OF LITERATURE 5 - Environmental Pollution Environmental Pollution and Circulatory 27 System - Environmental Pollution and Respiratory System 39 - Environmental Pollution and Renal System 69 Environmental Pollution and Central 77 Nervous System - Control of Environmental Pollution 94 SUMMARY 105 RECOMMENDATIONS 109 REFERENCES 111 ARABIC SUMMARY

### **ABREVIATIONS**

BAL Bronchoalveolar lavage

Ca Calcium

Cd Cadmium

CHD Coronary heart disease

CO Carbon monoxide
COHb Carboxy hemoglobin

Cu Copper

CVD Cardiovascular disease

dB Decibel

DBP Diastolic blood pressureDDT Diphenyl trichloroethane

ECG Electrocardiogram

ETS Environmental tobacco smoke

Fe Iron

FEV<sub>1</sub> Forced expiratory volume in 1 second

FVC Forced vital capacity

Hb Hemoglobin

HCI Hydrochloric acid

hr Hour

HR Heart rate

I.Q Intelligence quetientISHD Ischemic heart disease

K Potassium

Km<sup>3</sup> Kilometer qube

Kms Kilometers mg Milligram

### Abreviations

Mg Magnesium

μg/L Microgram/Litre

μ**m** Micrometer

μ**mol** Micromole
Na Sodium

NANA N-acetyl-N-neuraminic acid

ng Nanogram

Ni Nickle

NO Nitrous oxide

NO<sub>2</sub> Nitrogen dioxide

**OPIPD** Organophosphate induced delayed polyneuropathy

Pb Lead

PCBs Polychlorinated biphenyls

PGE<sub>2</sub> Prostaglandin

 $PM_{10}$  Particles less than  $10\mu m$ 

PMNs Polymorphnuclear lymphocytes

RBP Retinol-binding protein
SBP Systolic blood pressure

SBs Sick building syndrome

SIDS Sudden infant death syndrome

SO<sub>2</sub> Sulphur dioxide

SPM Suspended particulate matter

TCE Trichlorethylene

VLBW Very low birth weight

Zn Zinc

**ZPP** Zinc protoporphyrins

| LIST OF FIGURES                              |      |
|--|------|
|  | Page |
| Figure 1: The trend of cigarette consump-    |      |
| tion in Egypt from 1965 to 1985              |      |
| (Omar et al., 1989).                         | 10   |
|  |      |
| Figure 2: Percentage contribution of various |      |
| radiation sources (Arthur, 1992).            | 25   |
|  |      |
| Figure 3: Extreme hypotonia and photopho-    |      |
| bia in an infant with acrodynia.             |      |
| (Akabane, 1996).                             | 87   |
|  |      |
|  |      |
|  |      |
|  |      |
|  |      |
|  |      |
|  |      |
|  |      |
|  |      |
|  |      |
|  |      |



## LIST OF TABLES Page Table 1: Common air pollutants, their sources and pathological effects on man (Southwick, 1976). 7 Table 2: Mortality increase in the London smog of 1952 (Verma and Agarwal, 1986). 8 Table 3: Pathological effect of heavy metal water pollutants on man (Verma and Agarwal, 1986). 13 Table 4: The different sources of lead in child's environment (Sawyer et al., 1986). **20** Table 5: Forms of Mercury (Lambert, 1996). 22 Table 6: Examples of extrinsic allergic alveo-

litis (Crompton and Mc Hardy,

Table 7: Nephrotoxic compounds (Bergstein,

1996).

60

70

1988).