بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

THE PREDICTIVE VALUE OF CARBOXYHEMOGLOBIN IN CRITICALLY ILL TRAUMATIZED PATIENTS.

Thesis

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بسم الله الرحمن الرحيم

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Dedication

To all Whom

I love

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Mohammed Moheb El Abd

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CONTENTS

LIST OF ABBREVIATIONS

ABG	Arterial blood gases
AIDS	Acquired immune deficiency syndrome
APACHE	Acute physiology and chronic health evaluation
APS	Acute physiology score
ARDS	Acute respiratory distress syndrome
CBC	Complete blood count
CNS	Central nervous system
CO	Carbon monoxide
COH	Carboxyhemoglobin
GC	Gas chromatography
GCS	Glasgow coma score
HBO	Hyper baric oxygen
HO	Heme oxygenase
I.C.U	Intensive care unit
NO	Nitric oxide
O_2	Oxygen
$P(A\text{-}a)O_2$	Alveolar-arterial oxygen tension gradient
$PaCO_2$	Partial arterial carbon dioxide tension
PaO_2	Partial arterial oxygen tension
PPM	Part per million
RTS	Revised trauma score
SaO_2	Oxygen saturation
SAPS	Simplified acute physiology score
SMC	Smooth muscle cells
SPSS	Statistical package for special scientists
TISS	Therapeutic intervention scoring system
TS	Trauma score
VSM	Vascular smooth muscle
WBC	White blood count

Introduction

INTRODUCTION

CARBON MONOXIDE

The normal blood cells contain hemoglobin, carbonic anhydrase enzyme (which catalyses reaction between carbon dioxide and water), cytoplasmic enzymes [glucose-6-phosphate dehydrogenase and pyruvate kinase, ions as potassium (K^+), sodium (Na^+), magnesium (Mg^+), chloride(Cl^-), bicarbonate (HCo_3^-) and phosphate (PO_4^-)[1].

Each molecule of hemoglobin consists of four subunits, each containing one polypeptide chain (globin) and one iron-protporphyrin complex (hem). Hem is a ring structure formed of 4 pyrol molecules (protporphyrin) with ferrous (Fe^{++}) ion at the center of the ring, it is essential for oxygen carriage. The 4 heme complexes join together to from a hemoglobin molecule with a binding capacity for 4 oxygen molecules (or 8 oxygen atoms)[1] .

The old, abnormal, or damaged red blood cells are phagocytosed by phagocytic cells of the reticuloendothelial system present in the spleen, liver, bone marrow and other tissues. The lysosomal enzymes break down the hemoglobin liberated from the red cells inside the reticuloendothelial cells, into hem and globin parts. The globin part is broken down into amino acids that are utilized for newer blood cell formation or used in the general protein synthesis in the body[2].

Iron is removed from the hem part of hemoglobin and released into blood where it is bound to the carrier protein transferrin, which carries iron to the bone

marrow where it is used again in erythropoiesis or to the liver where it is stored. The remaining part of the hem molecule is converted to biliverdin. Biliverdin in turn is converted to bilirubin which diffuses to the blood and binds to albumin, bilirubin is taken up by the liver, conjugated with glucuronic acid and secreted in the bile[2].

CO is a tasteless, odourless, colourless, and non-irritating gas produced by incomplete combustion of organic materials. It also produced in man during the catabolism of hemoglobin[3].

The normal endogenous production of CO is sufficient to saturate 0.4-0.7% of the body's hemoglobin-that is 0.4-0.7% carboxyhemoglobin (COH) at rest. However a national survey in North America found 2-3% COH in urban non smokers as a result of environmental exposure and 5-6% in smokers (cigarette smoker contains about 4% CO)[4].