Yemen Republic
Ministry of Higher Education&
Scientific Research
Al-Razi University
College of Medical Sciences

الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
جامعة الرازي
كلية العلوم الطبية

Title of the study

Application of Pre -Anesthesia checklist in Patients Undergoing Operation in Public Hospitals in Sana'a City-Yemen

Research Graduation Submitted to the Department of applied Medical Sciences, Anesthesia Program, College of Medical sciences, Al-Razi University As A partial Fulfillment for B.Sc. Anesthesia

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عنوان الدراسة

تطبيق قائمة ما قبل التخدير للمرضى الخاضعين للعمليات في المستشفيات العامة في صنعاء-اليمن

بحث تخرج مقدمه الى قسم العلوم الطبية التطبيقية، برنامج التخدير ، كلية العلوم الطبية ، جامعة الرازي ،لاستكمال متطلبات درجة البكالوريوس في التخدير

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1439

CERTIFICATE:

This is to certify that the research graduated entitled, ***Application of Pre - Anesthesia checklist in Patients Undergoing Operation in Public Hospitals in Sana'a City-Yemen****; which submitted to the Department of Applied medical sciences, college of Medical Sciences, Al-Razi University for the award BSc. degree in Anesthesia. It is a recorded of the original and bona fide research work carried out by* ***students*** *under our guidance. Such material as has been obtained from other sources has been duly acknowledged in the thesis. This research embodies the work of the candidate herself and no part thereof has been submitted for any other degree or diploma.*

Supervisor:
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(Consultant anesthesiologist)

الإهــداء

DEDICATION:

إلى المتربعة على عرش الأيام الطفلة التي عمرت بيتها من الحب والحجارة المهرة

الأصيلة التي طالما سبقت دنياها وزمانها

بلدنا الغالية

إلى اليد الطاهرة التي أزالت من أمامنا أشواك الطريق

ورسمت المستقبل بخطوط من الأمل والثقة

إلى الذي لا تفيه الكلمات والشكر والعرفان بالجميل

أباءنا الأعزاء

إلى من ركع العطاء أمام قدميها

وأعطتنا من دمها وروحها حبا وتصميما ودفعا لغدٍ أجمل

إلى الغاليات التي لا نرى الأمل إلا من عينيها

أمهاتنا الحبيبات

إلى من أخذ بأيدينا . . . ورسم الأمل كل خطوة مشيناها

إلى أصدقائنا الذين تسكن صورهم وأصواتهم أجمل اللحظات والأيام التي

عشناها . . . . . .

شكرنا الجزيل وامتناننا إلى كل من ساعدنا في انجاز هذا العمل . .

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وقبل أن نمضي نقدم أسمى آيات الشكر والامتنان والتقدير والمحبة إلى الذين حملوا أقدس رسالة في الحياة.....

إلى الذين مهدوا لنا طريق العلم والمعرفة...

إلى جميع أساتذتنا الأفاضل.....

"كن عالما فإن لم تستطع فكن متعلما ، فإن لم تستطع فأحب العلماء ،فإن لم تستطع فلا تبغضهم"

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إلى من علمنا المضي إلى الأمام، إلى من أعاننا، إلى من وقف إلى جانبنا، إلى من كان سنداً لنا في إنجاز حلمنا ومشروعنا العلمي.....

الدكتور: أحمد محيي العنسي

والذي نقول له بشراك قول رسول الله صلى الله عليه وسلم:

"إن الحوت في البحر، والطير في السماء، ليصلون على معلم الناس الخير"

وكذلك نشكر كل من ساعد على إتمام هذا البحث وقدم لنا العون ومد لنا يد المساعدة وزودنا بالمعلومات اللازمة لإتمام هذا البحث ونخص بالذكر

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ونشكر أيضاً من ساهم في إنجاح وإنجاز هذا البحث وأعاننا وأرشدنا وأخص بالذكر

الدكتور: عبد الفتاح الجرادي

و الدكتور/صادق الوصابي

أما الشكر الذي من النوع الخاص فنحن نتوجه بالشكر أيضا إلى كل من لم يقف إلى جانبنا، ومن وقف في طريقنا وعرقل مسيرة بحثنا، وزرع الشوك في طريق بحثنا فلولا وجودهم لما أحسسنا بمتعة البحث، ولا حلاوة المنافسة، ولولاهم لما وصلنا إلى ما وصلنا إليه فلهم منا كل الشكر.

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LIST OF ABBREVIATIONS:

ASA	American Society Of Anesthesiologists
ACC	American College of Cardiology
APSF	Anesthesia Patient Safety Foundation
AHA	American Heart Association
APTT	Activated partial Thromboplastin Time
ASRA	American Society of Regional Anesthesia
CSQ	Consultation Satisfaction Questioner
CBC	Count bleed cells
COX-2	Cyclooxygenase-2
CAHPs	Consumer Assessment Of Health Plans
DVT	Deep Vein Thrombosis
EBA	European Board of Anesthesiology
ESA	European Society of Anesthesiology
FDA	Food and Drug Administration
FONDA	Fondaparinux
GP	Glycoprotein
GDG	Guideline Development Group
IV	Intravenous
IOM	Institute of Medicine
INR	
LMWH	Low Molecular Weight Heparin
MET	Metabolic equivalents
MAC	Monitoring Anesthesia care
MI	Myocardial Infraction
NSAIDs	Non-steroidal Anti-Inflammatory Drugs
SPSS	Statistical Package For Social Sciences
SD	Standard Deviation
SC	Subcutaneous
US	United States
UFH	unfractionated heparin

ABSTRACT

Background of The study:

Checklists and related cognitive aids have become an integral part of health care safety processes. There are good data to support the impact of checklists in improving the quality of health care professional's handoffs of care, as well as adherence to care standards in perioperative crisis situations. Our purpose of this study was to identify the accurate application and implementation of this checklist between anesthetic stuff. To how much extent they apply and fill the history sheet, how they perform the physical exam, what the preoperative labs they ask, if they do premedication for their patient, and if they specify the anesthetic plan

Methods

A descriptive, cross-sectional study carried out from August to October 2017 in order to assess the knowledge and practice the Assessment Application of Anesthesia checklist in Patients Undergoing Operation in public Hospitals in Sana'a City-Yemen**.** The study population were all-elective and emergency surgeries (minor, major) underwent (general or regional anesthesia) who were operated during the study period, it included 100 patients which they were selected through convenience sample technique. The sample size was convenience. This study was done in two public hospitals in Sana'a city (Al-Thawra and Al-Jumhory hospitals), these hospitals are a teaching and referral hospitals in Yemen. It provides primary, secondary and tertiary health care, we designed a set of 6 questions covering the preoperative period, All questions were with "Yes", "No" answer for each statement.

Result:

A total of 100 patients were included in the study, the majority of study subjects, 51 (51 %) were females and 49 (49%) were males. The most common in type of operation are Abdominal about (44%) then, Head and neck about (23%). There more common of previous anesthetic is previous operation, anesthetics about (71%) is applied, and the others comes after. The more common result to types of physical examination use is vital signs about (100%), Heart in the second level by (95%). The more common result to type of laboratory test done part one about (86%) of the sample applied by the (CBC) test, after that the second type of test is Urine by (63%). The more common of the result to types of laboratory test part two is by the Bun: creatinine in the first rink about (82%). The more common of the result to types premedication it is of the analgesics about (65%) than followed by anxiety about (55%). The more common of result to the types of anesthetic plan is the patient consent about (96%) and followed by general anesthesia about (94%) and only of the less common is special techniques about (2%).

Conclusion:

We conclude that, most of the anesthesiologist were apply history &physical exam chick list for patients undergoing operation as they also give important care to some lab and consent before operation, but they give less care to premedication, anesthesia monitoring and ASA class, which can be a cause of patient complications and even death.

CHAPTER ONE: INTRODUCYION

Introduction

Cognitive aids such as checklists, handbooks, calculators, and advice hotlines come in different forms but serve similar functions. They make knowledge "explicit" and "in the world" rather than only being implicit, in someone's brain. Memory and cognitive functioning are vulnerable to error or complete failure, especially in stressful situations. Cognitive aids offload memory and safeguard the recall of critical items. They also help ensure the use of current best practices because during a crisis, people sometimes revert to what they originally learned as the best, not what is the latest recommendation. The use of cognitive aids rather than memory alone is another sign of strength. (Ronald D.Miller,Lars I. Eriksson, 2010)

The most important component of every anesthetic regimen is the human performance of the anesthetist and its relationship to patient safety. More than 70% of accidents are due to "human factors." Because the performance of the anesthetist—embedded in a larger system of care—is such a critical and most determining aspect of patient safety, education and training of health care professionals in this area need improvement. (Ronald D.Miller, Lars I. Eriksson, 2010).

Anesthesia is an intrinsically hazardous undertaking, but as hazardous activities go, its track record is indeed a model of patient safety for the rest of health care. The Institute of Medicine (IOM) asserts: "Anesthesia is an area in which very impressive improvements in safety have been made." However, the theory of organizational safety teaches us that safety is a never-ending process; any patient

harmed by an anesthetic is one patient too many (in concert with the “zero vision” statement of the U.S. Anesthesia Patient Safety Foundation [APSF]: “That no patient shall be harmed by anesthesia”). Cooper and Gaba wrote: “Anesthesiologists should remain aware of the hazards they still face, take pride in having been the leaders in patient safety efforts, and stay motivated to continue the pursuit of ‘no harm from anesthesia’ with the passion it still demands.”(Ronald D. Miller, Lars I. Eriksson, 2010).

1.2 Problem statement

Surgical operations greatly benefit the public health; however, they can also be directly responsible for substantial morbidity and mortality. In industrialized countries, the rate of perioperative death directly due to inpatient surgery has been estimated at 0.4 percent to 0.8 percent, and the rate of major complications has been estimated at 3 % to 17 % (Jonathan R. Treadwell, Scott Lucas,) Sources of these complications are numerous, including wrong-patient/procedure/site surgery. Anesthesia equipment problems lack of availability of necessary equipment, unanticipated blood loss, non-sterile equipment, and surgical items (e.g., sponges) left inside patients. The complexity of most surgical procedures requires a well-coordinated team to prevent these events.

In 2003, NICE first issued guidance on the use of routine preoperative tests for elective surgery (NICE CG3). The guideline evaluated the practice of routinely performing preoperative diagnostic tests for elective surgery in healthy and comorbid populations. Much of the evidence in the original guideline was inconclusive and a formal consensus survey about the appropriateness of

preoperative testing was conducted to inform the recommendations made by the Guideline Development Group (GDG).

The medical community recognizes that anesthesia has reached a high level of safety. However, with increased awareness, it is believed that the risk, particularly morbidity risk, can be further reduced.(Stander SE, Mahajan RP, 2011) As an example of increasing awareness, in June 2010, the European Board of Anesthesiology (EBA) and the European Society of Anesthesiology (ESA) jointly adopted the "Helsinki Declaration on Patient Safety in Anesthesiology." Also, the journal Health Devices listed, "Anesthesia hazards due to incomplete pre-use inspection" as one of the top ten technology hazards in 2012 .

1.3 Rationales of the Study

Checklists and related cognitive aids have become an integral part of health care safety processes (Haynes AB, Weiser TG, 2009 & Agarwala AV, Firth PG, Albrecht MA, 2015). There are good data to support the impact of checklists in improving the quality of health care professional is handoffs of care, as well as adherence to care standards in perioperative crisis situations (Arriaga AF, Bader AM, Wong JM, 2013&Tan JA, Helsten D. 2013 & Petrovic MA, Martinez EA, Aboumatar H, 2012).

Performing routine anesthesia often requires `a series of tasks, which if omitted can put the patient at an increased risk. Based on Perrow's(Perrow C Normal Accidents 1984) "Theory of the Normal Accident," the interactions of tasks managing an anesthetized patient are about as tightly coupled, and even more complex, than flying an aircraft (Webster CS, Stabile M, Merry AF,2009) Because adverse events are underreported, the exact rate of mishaps and errors for many critical anesthesia incidents remains unclear. However, studies of the completeness of preparation of the anesthesia workplaces before induction found that 10% to

17% of the time at least important item was either missing or not functioning(Demaria S Jr, Blasius K, Neustein SM, 2011 & Thomassen Ø, Brattebø G, Søfteland E, 2010). Thus, it is not surprising that "failure to check or inspect" was identified as the cause in 22% to 33 % of all critical incidents with significant negative outcome. (Craig J, Wilson ME. 1981 & Cooper JB, Newbower RS, Kitz RJ. 1984). Existing data similar to aviation accidents indicate that the lack of provider competence has rarely been a major contributing factor to anesthesia errors with negative outcome (Cooper JB, Newbower RS, Kitz RJ. 1984) Instead, there are "temporary and atypical lapses in the vigilance of otherwise competent anesthetists." (Cooper JB, Newbower RS, Kitz RJ. 1984)Haste, distraction, fatigue, inattention, boredom, and failure to check have been factors associated with preventable anesthesia mishaps in >60% of adverse events (Cooper JB, Newbower RS, Long CD. 1978)

In 1978, the Food and Drug Administration (FDA), developed a generic anesthesia equipment peruse checklist. The checklist was first released by the FDA in August 1986 and endorsed by the American Association of Nurse Anesthetists on October 18, 1986. The FDA checklist was revised in 1992 to improve the abilities of anesthesia providers to detect machine faults.

In 2009, the original World Health Organization Surgical Safety Checklist incorporated some basic aspects of a pre-induction checklist, but the scope of this checklist is too broad to cover the specific items that have been shown to be key factors in error or omissions in anesthesia. Others have studied or promoted anesthesia-specific, pre-induction checklists (Stoelting RK 2013) For example, Hart and Owen published simulation results after developing a pre-induction checklist for cesarean delivery under general anesthesia. The authors reported a surprising finding: Although 95% of participants in simulation trials considered the

checklist helpful, and 80% would like to use it in training situations, only 40% believed that the checklist was useful in real clinical settings. More recently, the Anesthesia Patient Safety Foundation surveyed anesthesia professionals regarding the need for a pre-induction checklist. Based on the positive results, a pre-anesthetic induction patient safety checklist draft was developed, and a grant was offered to study the implementation and performance of this checklist.(Stoelting RK 2013) The bias of anesthesiologists to consider the induction phase as the most critical time of anesthesia is well described. (Cooper JB, Newbower RS, Long CD. 1978) However, this period in fact contributes only to 26% of preventable mishaps in anesthesia. The majority of incidents instead happen during the maintenance of anesthesia (Cooper JB, Newbower RS, Long CD. 1978 & Bhananker SM, Ramamoorthy C, 2007) and the emergence phase seems to be as hazardous for preventable mishaps as the induction phase (24%). This speaks to the potential utility of checklists for these phases of the anesthesia workflow.

CHAPTER TWO: LITRATURE REVIEW

2.1 Purposes of the study:

As mentioned before the checklist effect and it's benefit in safety of patient and reducing complications is well- proved and known, our purpose of this study was to identify the accurate application and implementation of this checklist between anesthetic stuff. To how much extent they apply and fill the history sheet, how they perform the physical exam, what the preoperative labs they ask, if they do premedication for their patient, and if they specify the anesthetic plan.

In fact there are many organizations create many modules of checklist for many purposes pre, intra and postoperative, which by time had been developed by these organization, but we faced the lake information and studies which can be compared to our study. That is because items studied were not similar to ours. For examples (Krombach, Jens W. MD) et all studied the implementation of these items "Technician setup of the anesthesia workplace, Provider setup of the anesthesia workplace (including anesthesia machine check) and Pre-induction…..etc (Krombach, Jens W. MD, 2015) .

2.2 History of checklist progress and development :

Historically, at 1978, the Food and Drug Administration (FDA), developed a generic anesthesia equipment peruse checklist. The checklist was first released by the FDA in August 1986 and endorsed by the American Association of Nurse Anesthetists on October 18, 1986. The FDA checklist was revised in 1992 to improve the abilities of anesthesia providers to detect machine faults.

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In June 2010, the European Board of Anesthesiology (EBA) and the European Society of Anesthesiology (ESA) jointly adopted the “Helsinki Declaration on Patient Safety in Anesthesiology.” Also, the journal Health Devices listed, “Anesthesia hazards due to incomplete pre-use inspection” as one of the top ten technology hazards in 2012.

2.3 Integration Of Checklists Within The Modern Anesthesia Workplace:

Krombach,et al state:" We learned that even motivated anesthesia providers will not use checklists stored in a drawer. Instead, we concluded that the checklists must be within the immediate vicinity of the provider and instantly displayed to be used. These findings and conclusion match those described by Goldhaber-Fiebert and Howard regarding the storage and display of emergency manuals. Attempts to display routine checklists through laminated cards, a

document holder, or in booklet form were not successful. Therefore, we decided to develop a software application (app) that allows display of the checklists by securely mounted tablet computers attached to the anesthesia machine. An additional advantage of using this approach was that the routine checklists could be in the same place as checklists for provider handoff and crisis management".

Only one study was similar to our study in comparable items, which was done by (Robert K. Stoellting) (Krombach, Jens W. MD) et all studied the implementation of these items "Technician setup of the anesthesia workplace, Provider setup of the anesthesia workplace (including anesthesia machine check) and Pre-induction (Roizen MF, Foss JF, Fischer SP, 2000)

2.4 Pre-operative Assessment

2.4.1 The History

The history is the most important component of the preoperative evaluation. The history should include a past and current medical history, a surgical history, a family history, a social history (use of tobacco, alcohol and illegal drugs), a history of allergies, current and recent drug therapy, unusual reactions or responses to drugs and any problems or complications associated with previous anesthetics. A family history of adverse reactions associated with anesthesia should also be obtained. In children, the history should also include birth history, focusing on risk factors such as prematurity at birth, perinatal complications and congenital chromosomal or anatomic malformations and history of recent infections, particularly upper and lower respiratory tract infections.

The history should include a complete review of systems to look for undiagnosed disease or inadequately controlled chronic disease. Diseases of the

cardiovascular and respiratory systems are the most relevant in respect of fitness for anesthesia and surgery (Roizen MF, Foss JF, Fischer SP , 2000).

2.4.2 Physical examination

The physical examination should build on the information gathered during the history. At a minimum, a focused pre-anesthesia physical examination includes an assessment of the airway, lungs and heart, with documentation of vital signs. Unexpected abnormal findings on the physical examination should be investigated before elective surgery.

2.4.3 Laboratory work up

It is generally accepted that the clinical history and physical examination represent the best method of screening for the presence of disease. Routine laboratory tests in patients who are apparently healthy on clinical examination and history are not beneficial or cost effective. A clinician should consider the risk-benefit ratio of any ordered lab test. When studying a healthy population, 5% of patients will have results which fall outside the normal range. Lab tests should be ordered based on information obtained from the history and physical exam, the age of the patient and the complexity of the surgical procedure.

2.5 Indications for specific preoperative tests

2.5.1 Drug history

A history of medication use should be obtained in all patients. Especially, the geriatric population consumes more systemic medications than any other group. Numerous drug interactions and complications arise in this population and special attention should be paid to them.

Generally, administration of most drugs should be continued up to and including the morning of operation, although some adjustment in dosage may be required (e.g. anti-hypertensive, insulin).

Some drugs should be discontinued preoperatively. The monoamine oxidase inhibitors should be withdrawn 2-3 weeks before surgery because of the risk of interactions with drugs used during anesthesia. The oral contraceptive pill should be discontinued at least 6 weeks before elective surgery because of the increased risk of venous thrombosis.

Recently, the American Society of Anesthesiologists (ASA) examined the use of herbal supplements and the potentially harmful drug interactions that may occur with continued use of these products preoperatively. All patients are requested to discontinue their herbal supplements at least 2 weeks prior to surgery.

The use of medications that potentiate bleeding needs to be evaluated closely, with a risk-benefit analysis for each drug and with a recommended time frame for discontinuation based on drug clearance and half-life characteristics. Aspirin should be discontinued 7-10 days before surgery to avoid excessive bleeding and thienopyridines (such as clopidogrel) for 2 weeks before surgery. Selective cyclooxygenase-2 (COX-2) inhibitors do not potentiate bleeding and may be continued until surgery. Oral anticoagulants should be stopped 4-5 days prior to invasive procedures, allowing INR to reach a level of 1.5 prior to surgery.

2.6 Perioperative risk assessment

Perioperative risk is a function of the preoperative medical condition of the patient, the invasiveness of the surgical procedure and the type of anesthetic administered. (Hippokratia, 2007)

The ASA grading system was introduced originally as a simple description of the physical state of a patient. Despite its apparent simplicity, it remains one of the few prospective descriptions of the patient general health which correlates with the risk of anesthesia and surgery. It is extremely useful and should applied to all patients who present for surgery. Increasing physical status is associated with increasing mortality. Emergency surgery increases risk dramatically, especially in patients in ASA class 4 and 5.

2.7 American Society of Anesthesiologists' Classification of Physical Status

Surgical complications occur frequently. One large study documented at least one complication in 17% of surgical patients. Surgery-related morbidity and mortality generally fall into one of three categories: cardiac, respiratory and infectious complications. The overall risk for surgery-related complications depends on individual factors and the type of surgical procedure. For example, advanced age places a patient at increased risk for surgical morbidity and mortality. The reason for an age-related increase in surgical complications appears to correlate with an increased likelihood of underlying disease states in older persons. Diseases associated with an increased risk for surgical complications include respiratory and cardiac disease, malnutrition and diabetes mellitus. With respect to the type of surgery, major vascular, intra-abdominal and intra-thoracic surgical procedures, as well as intracranial neurosurgical procedures are frequently associated with increased perioperative morbidity and mortality. In addition, urgent and emergency procedures constitute higher risk situations than elective, non-urgent surgery and present a limited opportunity for preoperative evaluation and treatment. (Hippokratia, 2007)

When one looks at strictly anesthetic problems that lead to morbidity and mortality, airway problems and failure to provide adequate ventilation leading to

hypoxia become important. Fortunately, the number of critical incidents involving anesthetics alone appear to be decreasing in recent years.

2.8 Assessing cardiovascular risk

The American College of Cardiology (ACC) and the American Heart Association (AHA) published a task force report on Guidelines for Perioperative Cardiovascular Evaluation for Non cardiac Surgery. The purpose is to provide a framework for considering cardiac risk of non-cardiac surgery in a variety of patients and operative situations. (Hippokratia, 2007)

The factors, which guide decision-making, include the patient's cardiovascular risk and functional capacity and the surgery specific risk

2.9 Surgery-Related Predictors for Risk of Perioperative Cardiac Complications

Patient's risk factors are usually subdivided into three categories: major, intermediate and minor. A 6-week period is necessary for the myocardium to heal after an infarction and for the thrombosis to resolve. Patients with coronary revascularization done within the preceding 40 days should also be classified as high-risk patients. Because of sympathetic stimulation and hypercoagulability during and after surgery, patients with major predictors have a five times greater perioperative risk. Only vital or emergency surgical procedures should therefore be considered for these patients. All elective operations should be postponed and the patients properly investigated and treated. (Hippokratia, 2007)

Intermediate-risk factors are proof of well established but controlled coronary artery disease. Diabetes mellitus is included in this category because it is

frequently associated with silent ischemia and represents an independent risk factor for perioperative mortality.

Minor risk factors are markers of an increased probability of coronary artery disease, but not of an increased perioperative risk, Exercise tolerance is a major determinant of perioperative risk. It is usually evaluated by the estimated energy requirement for various activities and graded in metabolic equivalents (MET) on a scale defined by the Duke Activity Status Index One MET represents the oxygen consumption of a resting adult (3.5 ml/kg/min). (Hippokratia, 2007)

Examples of Functional Capacity

Surgical procedures can be stratified into three categories, according to their level of perioperative physiological stress

Previous MI

Till recently it was accepted generally that a MI within 6 months of proposed surgery is a contraindication to elective anesthesia and surgery. It appears now that the risk after a previous infarction is related less to the age of the infarction than to the functional status of the ventricles and to the amount of myocardium at risk from further ischemia. A small infarction without residual angina in the context of a good functional status allows essential non-cardiac surgery as soon as 6 weeks after the ischemic episode. On the contrary, a patient with a large infarct, residual symptoms and ejection fraction <0.35 has a high probability of a further cardiac event, even 6 months after the infarction. Usual practice guidelines consider the period within 6 weeks of infarction as a time of high risk for a perioperative cardiac event, because it is the mean healing time of the infarct-related lesion. The period from 6 weeks to 3 months is of intermediate

risk; this period is extending beyond 3 months in cases with complications such as arrhythmias, ventricular dysfunction or continued medical therapy. In uncomplicated cases, no benefit can be demonstrated for delaying surgery more than 3 months after an ischemic accident.

Recent data have shown that any event in the coronary circulation, (ischemia, infarction, or revascularization), induces a high-risk period of 6 weeks and an intermediate-risk period of 3 months. A 3-month minimum delay is therefore indicated before performing non-cardiac surgery after myocardial infarction or revascularization. However, this delay may be too long if an urgent surgical procedure is requested, as for instance with rapidly spreading tumors, impending aneurysm rupture, infections requiring drainage, or bone fractures. In these situations, recent studies, have demonstrated a marked benefit of operating under the protection of β_1-adrenergic antagonism, which reduces the cardiac complication rate in such patients. When possible, beta-blockers should be started days or weeks before elective surgery, with a target heart rate between 50 and 60 beats per minute.

2.10 Perioperative management of Anti-coagulation

2.10.1 Surgery in the anti-coagulated patient

In performing non cardiac surgery on patients on long-term oral anticoagulation, the major concern is when it is safe to perform surgery without increasing the risk of hemorrhage or increasing the risk of thromboembolism (venous, arterial) after discontinuing oral anticoagulation therapy. There is no consensus as to how perioperative anticoagulation should be managed. Listed below are some helpful recommendations that can be used along with clinical judgment in order to come up with a solution for the individual patient:

Most patients can undergo dental extractions, arthrocentesis, biopsies, ophthalmic operations and diagnostic endoscopy without alteration of their regimen. For other invasive and surgical procedures, oral anticoagulation needs to be withheld and the decision whether to pursue an aggressive strategy of perioperative administration of intravenous (IV) heparin or subcutaneous (SC) low-molecular-weight heparin (LMWH) should be individualized.

Invasive surgery is generally safe (from major hemorrhagic complication) when the INR ~1.5.

It takes approximately 4 days for the INR to reach 1.5 once oral anticoagulant is stopped preoperatively.

It takes approximately 3 days for the INR to reach 2.0 once oral anticoagulant is restarted postoperatively.

If oral anticoagulant is held 4 days pre-op and started immediately post-op, the patient is, in the mean time, without anticoagulation for 2 days (24 hours preop and 24 hours post-op).

2.10.2 Management recommendations:

If INR pre-op is 2-3, stop oral anticoagulant 4 days prior to surgery (or longer if INR > 3.0).

Measure INR one day prior to surgery: if it is ≥ 1.7, give 1 mg vitamin K SC.

If on the day of surgery the INR is 1.3-1.7, administer 1 unit of fresh frozen plasma and administer 2 units if the INR is 1.7-2.0.

The following approaches can be used: administer full-dose anticoagulation with IV unfractionated heparin (UFH); administer full-dose anticoagulation with LMWH; or administer prophylactic doses of UFH or LMWH.

2.10.3 Regional anesthesia in the anti-coagulated patient

Regional anesthesia has become the anesthetic technique of choice for many surgical procedures. However, the enthusiasm for selecting regional anesthesia is tempered by the fear of a spinal or epidural hematoma. This fear arises because patients who present for procedures where a regional technique would be of benefit often have some impairment of their hemostatic system (e.g., a pregnant patient with preeclampsia and thrombocytopenia, an orthopedic patient receiving thromboprophylaxis, or vascular surgery patients who are often completely anti-coagulated intra-operatively).

Regional anesthesia can be safely performed in patients receiving anticoagulant or antiplatelet therapy if patient management is based on appropriate timing of needle placement and catheter removal relative to the timing of anticoagulant drug administration. The patient's coagulation status should be optimized at the time of spinal or epidural needle/catheter placement and the level of anticoagulation must be carefully monitored during the period of epidural catheterization. Indwelling catheters should not be removed in the presence of therapeutic anticoagulation, as this appears to significantly increase the risk of spinal hematoma. Vigilance in monitoring is critical to allow early evaluation of neurologic dysfunction and prompt intervention.

2.10.4 Patient Receiving Thrombolytic Therapy

Patients receiving fibrinolytic/thrombolytic medications are at risk of serious hemorrhagic events:

Thrombolytic drugs should be avoided for 10 days following lumbar puncture, spinal or epidural anesthesia, or epidural steroid injection.

Spinal or epidural anesthesia are contraindicated in patients receiving fibrinolytic and thrombolytic drugs. Data are not available to clearly outline the length of time neuraxial puncture should be avoided after discontinuation of these drugs.

2.10.5 Patient Receiving Unfractionated Heparin

Monitoring of the therapeutic anticoagulation of patients receiving UFH is achieved via the activated partial thromboplastin time (aPTT). Normal values of the aPTT range from 24 to 35 .

During subcutaneous mini-dose prophylaxis (5,000 units 2 h before surgery) there is no contraindication to the use of spinal/epidural anesthesia.

When intraoperative anticoagulation with heparin during vascular surgery is combined with a neuraxial technique the following cautions are essential:

a) The technique should be avoided in patients with other coagulopathies.

b) Heparin administration should be delayed for 1 h after needle placement.

c) Epidural catheters should be removed 2-4 h after the last heparin dose, while re-heparinization should occur 1 h after catheter removal.

The concurrent use of medications that affect other components of the clotting mechanisms (antiplatelet medications, LMWH and oral anticoagulants) may increase the risk of bleeding complications for patients receiving standard heparin.

2.10.6 Patient Receiving Low Molecular Weight Heparin (LMWH)

In the United States (US) the usual dosing regimen for postsurgical deep vein thrombosis (DVT) prophylaxis with enoxaparin is 30 mg SC, every 12 h, with the initial dose administered 12-24 h postoperatively. The European enoxaparin dosing protocol consists of 40 mg SC/day. However, the European regimen is associated with a much lower incidence of epidural hematoma formation.

LMWH prophylaxis with European regimens (e.g. 40 mg enoxaparin daily) does not seem to increase the risk of spinal bleeding, providing that a minimum interval of 10-12 h has elapsed between administration and puncture, The next dose of LMWH should not be given less than 4 h after puncture.

Epidural or spinal catheters should not be removed until at least 12 h after the last dose of LMWH. Subsequent LMWH dosing should occur at least 2 h after catheter removal.

Antiplatelet or oral anticoagulant medications administered in combination with LMWH and interactions of LMWH with dextrans may increase the risks of spinal hematoma formation.

In patients scheduled for spinal or epidural block, thromboembolic prophylaxis with LMWH should be started on the evening before surgery and continued on the evening of the day of surgery. This dosage has a similar thromboembolic efficacy as that starting on the morning of surgery.

If one elects to use twice-daily dosing as per the US protocol (30 mg q12h), the first dose of LMWH should be administered no earlier than 24 h postoperatively, regardless of anesthetic technique and only in the presence of adequate hemostasis.

2.10.7 Patients receiving Fondaparinux

Fondaparinux (FONDA) is a pent saccharide with antithrombotic effects. It is a selective factor Xa inhibitor with no known effects upon platelet function. However, thrombocytopenia can occur with the administration of FONDA and platelet counts should be closely monitored. The daily dose of FONDA is 2.5 mg SC, with the first dose given six to eight hours after the completion of surgery. The second and all subsequent doses, should be administered at 24 h intervals. Until further clinical experience is available, performance of neuraxial techniques is not recommended given the sustained antithrombotic effect, early postoperative dosing and irreversibility of this agent.

2.10.8 Patients receiving oral anticoagulants (vitamin K antagonists)

The spinal or epidural block is contraindicated in the patient who is fully anticoagulated with a vitamin K antagonist such as warfarin or acenocumarol (Sintrom).

If the surgery is emergent, the anticoagulation can rapidly be reversed through the administration of fresh frozen plasma, vitamin K, or prothrombin complex

concentrate and the INR value should be ~ 1.5 prior to neuraxial block or surgery.

If the surgery is elective, the anticoagulant therapy must be stopped 4-5 days prior to the planned procedure, allowing INR to reach a level of 1.5.

Epidural catheters should be removed when the INR is <1.5.

2.10.9 Non-steroidal Anti-Inflammatory Drugs (NSAIDs), antiplatelet medications and spinal axis anesthesia:

Many individuals, in particular the elderly (who more often suffer from osteoarthritis and rheumatoid diseases), use cyclooxygenase-1&2 inhibitors (COX-1 & COX-2) NSAIDs on a regular basis. The elderly are also more likely to have had cardiac stent placements or coronary angioplasties performed and may be taking antiplatelet medications such as the thienopyridines (ticlopidine and clopidogrel) or the newer platelet glycoprotein (GP) IIb/IIIa antagonists such as abciximab, eptifibatide and tirofiban. All of these agents alter platelet function and may increase the risk of spinal/epidural hematoma formation if spinal axis anesthesia is utilized without following proper precautions.

2.10.10 Patients receiving aspirin or a NSAID:

The American Society of Regional Anesthesia (ASRA) suggests that the use of COX-1 or COX-2 NSAIDs alone does not create a level of risk that will interfere with the performance of neuraxial blocks.

Two European Societies (German and Spanish) believe that there is a risk of hematoma formation when these agents are used in the perioperative period and they mandate at least a 3-day interval without aspirin or aspirin containing medications before neuraxial blocks are performed or epidural catheters are removed. In addition, they mandate a 1-2 day drug free interval for all other COX-1 NSAIDs.

2.10.11Patients receiving antiplatelet drugs:

ASRA guidelines are the following:

Ticlopidine (Ticlid) should be discontinued 14 days prior to surgery.

It is recommended that clopidogrel (Plavix) be stopped 7 days prior to surgery. Patients receiving platelet Glycoprotein IIb/IIIa Antagonists:

ASRA guidelines are the following:

Abciximab (Reo Pro) should be discontinued 48 h prior to surgery.

It is recommended that eptifibatide and tirofiban be stopped 8 h prior to surgery.

2.11 Basis for Control Procedures and Work Practices

The control procedures and work practices required in the recommended standard, or their 'equivalent, have been demonstrated to reduce anesthetic gas concentrations to the recommended levels and are commercially available and reasonably attainable

Scavenging In combination with good room ventilation is recommended over trapping volatile anesthetic agents on an adsorbing medium such as activated charcoal. Charcoal adsorption canisters may be used to control limited quantities of halogenated agents but they have little effect in controlling the levels of nitrous oxide and other gaseous agents released into the work environment. Simple scavenging techniques and adequate ventilation reportedly resulted in fewer health complaints from operating room personnel. It is believe that the control procedures and work practices recommended can effectively reduce occupational exposure levels to the concentrations presented in the recommended standard.

The procedures and practices will reduce occupational exposures, as evidenced. These controls will also provide the necessary reductions in anesthetic gas concentrations for agents that have no anesthetic occupational exposure limits. Including chlorofora, trichloroethylene, and diethyl ether. Based on operating room engineering control studies, the attainable TWA concentrations during administration of mixed anesthetics are 0.5 ppm for halothane and other volatile agents, and 25 ppm for nitrous oxide. Therefore, Instituting engineering control procedures and work practices to control exposure to all anesthetic agents to the lowest feasible level should also keep exposure to halogenated agents well below the 2-ppm recommended limit during inhalation anesthesia and analgesia in dentistry. The anesthetic agents leak into the room air from the exhalation valve, around the nasal mask, and through the patient's mouth. Dentists deliver anesthetics at higher flow rates than those used under usual operating room conditions. Because of the open breathing systems, high flow rates of anesthetics, and the proximity to the patient's head, the dentist, anesthetist, and dental assistant may be exposed to high concentrations of anesthetic agents. Nitrous oxide receives the greatest amount of use by dentists

and is giving in combination with halothane by oral surgeons. Environmental levels of nitrous oxide, halothane, and trichloroethylene in dental operators have been reported in the literature.

Anesthetic	Exposure		Ref.
Halothane	5.5-68 ppm	Oral surgeons' breathing zone	142
Trichloroethylene	25-50 ppm	Anesthetists' breathing zone	143

Table (1) SUMMARY OF DENTAL PERSONNEL EXPOSURES TO ANESTHETIC AGENTS

Nitrous oxide	94-3,000 ppm	Dentists, breathing zone	145
Halothane	1.5-36 ppm		145
Nitrous oxide	5,900 ppm (mean)	Dental assistants' breathing zone	145
	6,800 ppm (mean)	Dentists' breathing zone	Ub

Devices and procedures for controlling exposures of dental personnel to anesthetics have been developed by Whltcher et al, These procedures have been shown to be feasible, available, and effective In attaining TWA concentrations approaching 50 ppm during administrations of nitrous oxide when It Is used as the sole anesthetic.

Similarities in practice and in anesthetic agents used result in many of the same problems of exposure in veterinary personnel as among hospital operating room personnel. Nitrous oxide, halothane and methoxyflurane are the anesthetics most frequently used in veterinary anesthesia and the equipment used to administer anesthetics is the same as that used in human hospital operating rooms.

Problems of good fit with nose and facemasks and frequent use of the T-tube for smaller animals could result in significant exposure to veterinary personnel. NOSH, therefore, recommends that work practices and control procedures be Instituted In veterinary facilities to control occupational exposure to waste anesthetic gases to the same levels recommended for mixed anesthetic agent use.

2.12 Basis for Environmental Monitoring

Personal monitoring using long or short term monitoring is not required in this standard because of the critical nature of the work performed by personnel in the occupational environments covered by the standard. Sampling the breathing zone or the Immediate work area of those most heavily exposed (anesthetist, oral surgeon) should provide an adequate Index of exposure. Waste anesthetic gas distributions in Inhalation anesthetizing areas have also been shown to be relatively uniform, except for nearly expected hot spots, with good distribution studies, locations for general area monitoring can be determined. The no requirement for personal monitoring does not preclude that such monitoring be used to sample for effectiveness of Implemented work practices and control procedures, utilizing appropriate sampling and analytical techniques.

The recommended standard does not require the monitoring of all anesthetic agents used. Only the agents most frequently used needs to be monitored, since the recommended work practices and control procedures should reduce all agents proportionately.

Charcoal adsorption sampling and gas chromatographic analysis is recounted for monitoring exposure to halogenated anesthetics. This method is economical and readily available to an Individual In charge of an air-monitoring program and is the method most often used to monitor halogenated hydrocarbons. However, it does not have the sensitivity of other methods. The halogenated anesthetics are usually administered with nitrous oxide. In this situation, the recommended standard requires monitoring nitrous oxide. Sample collection and analysis techniques are presented In Appendices 11-IV. Direct Infrared analysis of nitrous oxide is the most desirable method. Gasbag or syringe sampling followed by Infrared or gas chromatographic analysis is

acceptable. Halothane may be measured by using gasbag or syringe sampling if the analysis is performed within a short time of sample collection. Proper work practices and scavenging procedures should reduce the levels of halogenated anesthetics. ^ien administered with nitrous oxide, to below the sensitivity limit of the charcoal tube method. Because, of this it is recommended that nitrous oxide be monitored.

2.13 Basis for Medical Monitoring

Medical monitoring of exposed personnel is recommended but is not a required part of the recommended standard. Maintenance of medical histories, with emphasis on the outcome of pregnancies in exposed women and in wives of exposed males is required. The most significant adverse health effects seen among exposed personnel are the reproductive effects among exposed women and among wives of exposed personnel. Medical counseling and care should be available to women of child-bearing age who feel their exposure to anesthetic gases may result In an adverse reproductive effect. Until some direct causal relationship between exposure to anesthetic gases and reported adverse health effects in exposed personnel is either provided or disproved. It is recommended that the medical histories of exposed personnel, especially women, be maintained during their period of emplojroent plus 20 y

CHAPTER THREE: OBJECTIVE OF THE STUDY

3.1 General objectives

The general objective of the study was to assess the application of Anesthesia checklist in Patients Undergoing Operation in public hospitals in Sana'a City-Yemen.

3.2 Specific objectives

1. To describe the application of medical history in Patients Undergoing Operation in public hospitals in Sana'a City-Yemen.
2. To identify the previous anaesthetics in Patients Undergoing Operation in public hospitals in Sana'a City-Yemen.
3. To assess the complete of physical examination sheet in Patients Undergoing Operation in public hospitals in Sana'a City-Yemen.
4. To determine the application of laboratory test in Patients Undergoing Operation in public hospitals in Sana'a City-Yemen.
5. To assess the application of premedication in Patients Undergoing Operation in public hospitals in Sana'a City-Yemen.
6. To find out the plan of anesthetic in Patients Undergoing Operation in public hospitals in Sana'a City-Yemen.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Study Design

A descriptive, cross-sectional study carried out from August to October 2017 in order to assess the knowledge and practice **the Assessment Application of Anesthesia checklist in Patients Undergoing Operation in public Hospitals in Sana'a City-Yemen**

4.2 Study setting

This study was done in two public hospitals in Sana'a city (Al-Thawra and Al-Jumhory hospitals), these hospitals are a teaching and referral hospitals in Yemen. It provides primary, secondary and tertiary health care.

The study population were all-elective and emergency surgeries (defined as surgery required to be performed within 48hour) (minor, major) underwent (general or regional anesthesia) who were operated during the study period, it included 100 patients which they were selected through convenience sample technique.

4.3 Sample Size

The sample size was convenience. The final sample size for this study was 100 patients.

4.4 Data collection Technique and Tools

The data were collected through medical history of the patients. The. File consist the following items:

Part I: Demographic data (age, sex, height، weight، preop-diagnosis) .

Part II: We designed a set of 6 questions covering the preoperative period, All questions were with "Yes", "No" answer for each statement.

4.5 Pilot Study:

The pre-test was done on 10 patients in the same setting. Pretest was performed to assess the questionnaire clarity, feasibility of the study and drawbacks of the questionnaire. Following the pilot study, corrections were made before the data collection. The pretest patients were excluded from the final study population.

4.6 Study variables/ Case definition

Study variables:

- Dependent variables:

The dependent variables were medical history, previous anesthetics, physical examination, laboratory test, Premedication, Plan of anesthetic

- Independent variables:

- Demographic variables.

B. Case definition:

- Intolerance: The inability of tolerance of drug, manifest as drug complication.
- Others: that include (gastro-esophageal reflex disease, congenital disease).
- Family history: A history of adverse anesthetic outcomes in family members should be evaluated and mentioned.
- Laboratory studies: Routine laboratory screening tests are rarely useful. Tests should be selected based on the patient's medical condition and the proposed surgical procedure in our study all laboratory tests were include.
- Last oral intake: The last time of taking anything by oral.
- Monitoring anesthesia care: is anesthesiologist or anesthesia techniquetion according of ASA stander monitor include (3-5 lead ECG, pulse oxymiter, temperature and capnograph).
- Invasive monitoring: is defined using (central line or arterial line).

4.7 Data processing and statistical analysis

The data was analysed by statistical package for social sciences (SPSS) version 20. Each completed chick list was re-checked for errors, completeness. Descriptive statistic (Frequency and percentage) were used to describe the qualitative variables

4.8 Ethical consideration

Ethical approval was obtained from the collage of Medical sciences, Al-Razi University. Letters from Al-Razi University, collage of Medical sciences to Hospitals directors as well as to the head of surgical wards to approve the study. (Appendix-B). Verbal consent was taken from the principles of hospitals before the chick list distribution. Confidentiality was ensured by avoiding personal identifications, keeping questionnaires locked.

4.9 Study constraints and limitations

Through the course of the present study, the constraints and limitations were:

- Statue of country (war and unsecure)
- Uncompleted data in files.
- Unorganized archiving

CHAPTER FIVE: RESULT

5.1 Demographic characteristics of the study participants

A total of 100 patients were included in the study, the majority of study subjects 51 (51 %) were females and 49 (49%) were males. Most of the respondents 41 (41 %) were in the age group of 21–40 years, 33 (33%) were in the age group of 1–20 years, 16 (16%) were in the age group of 41–60 years and 10 (10 %) were in the age group of >60 years. The most common in weight are between 46-60 about (36%)then, 31-45 years about (30%) and the all another weight comes after this two. The most common in length are between > 139 is about (60%)then, 120-139 cm about (25%) and the all another length comes after this two, the most common in type of operation are Abdominal about 44(44%) then, Head and neck about 23(23%).

Table 1: Demographic characteristic of the study participants

Demographic characteristic		**F**	**%**
Age	• 1-20 years	33	33.0
	• **21-40 years**	**41**	**41.0**
	• 41-60 years	16	16.0
	• Above of 60 years	10	10.0
Sex	• Male	49	49.0
	• **Female**	**51**	**51.0**
Weight	• 1-15 kg	6	6.0
	• 16-30 kg	9	9.0
	• 31-45 kg	30	30.0
	• **46-60 kg**	**36**	**36.0**
	• Above of 60 kg	19	19.0
Height	• 60-79 cm	4	4.0
	• 80-99 cm	5	5.0
	• 100-119 cm	6	6.0
	• 120-139 cm	25	25.0
	• **Above of 139 cm**	**60**	**60.0**
Type of operation	• Head and neck	23	23.0
	• Thoracic and vascular	7	7.0
	• **Abdominal**	**44**	**44.0**
	• Urinary and Reproductive	18	18.0
	• Orthopedic and CNS	8	8.0

5.2 Distribution of the result according to Type of Medical History applied

Table 2 shows distribution of the result according to type of medical history applied. The most result that by other in the first about 49(49%) and that followed by the drug used in the second about (36%), than we can see the rarely applied are Neurologic about (1%).

Table 2: Distribution of the result according to Type of Medical History applied

Type of Medical History		Results options	Response	
			F	%
1	**Allergies**	Yes	33	33.0
		No	**67**	**67.0**
2	**Intolerances**	Yes	21	21.0
		No	**79**	**79.0**
3	**Drug use**	Yes	36	36.0
		No	**64**	**64.0**
4	**Cardiovascular**	Yes	26	26.0
		No	**74**	**74.0**
5	**Respiratory**	Yes	13	13.0
		No	**87**	**87.0**
6	**Diabetic**	Yes	31	31.0
		No	**69**	**69.0**
7	**Neurologic**	Yes	1	1.0
		No	**99**	**99.0**
8	**Renal**	Yes	17	17.0
		No	**83**	**83.0**
9	**Hepatic**	Yes	4	4.0
		No	**96**	**96.0**
10	**Arthritis**	Yes	14	14.0
		No	**86**	**86.0**
11	**Muscular skeletal**	Yes	10	10.0
		No	**90**	**90.0**
12	**Other**	Yes	49	49.0
		No	**51**	**51.0**

5.3 Distribution of the result according to types of previous anesthetics

The results of the study regarding distribution of the participants according to types of previous anesthetics showed that, there most common is previous operation and anesthetics about 71(71%) is applied and the others comes after. More details are present in table 3.

Table 3: Distribution of the result according to types of previous anesthetics

Types of previous anesthetics		Results options	Response	
			F	%
1	**Previous operation and anesthetics**	**Yes**	**71**	**71.0**
		No	29	29.0
2	**Family history**	Yes	45	45.0
		No	**55**	**55.0**
3	**Last oral intake**	Yes	6	6.0
		No	**94**	**94.0**
4	**previous allergies from anesthetic drug**	Yes	0	0.0
		No	**100**	**100.0**

5.4 Distribution of the result according to types of physical examination

Table 4 shows that , the most common types of physical examination use is vital signs about (100%), Heart in the second level by (95%), the lungs is the third level about (93%), Airway is the fourth about (68%), the extremities is the fifth about (19%), the teeth is the sixth about (12%) and finally is Neurologic about (6%).

Table 4: Distribution of the result according types physical examination

Types Physical examination		Results options	Response	
			F	%
1	**Vital signs**	**Yes**	**100**	**100.0**
		No	0	0.0
2	**Heart**	**Yes**	**95**	**95.0**
		No	5	5.0
3	**Lungs**	**Yes**	**93**	**93.0**
		No	7	7.0
4	**Airway**	**Yes**	**68**	**68.0**
		No	32	32.0
5	**Extremities**	Yes	19	19.0
		No	**81**	**81.0**
6	**Neurologic**	Yes	6	6.0
		No	**94**	**94.0**
7	**Teeth**	Yes	12	12.0
		No	**88**	**88.0**

5.5 Distribution of the result according to Laboratory test (part 1)

Table 5 shows that, there are more type of laboratory test done part one about (86%) of the sample applied by the (CBC) test, after that the second type of test is Urine by (63%) and the others laboratory test comes after this two type of laboratory test.

Table 5: Distribution of the result according to Laboratory test (part 1)

Laboratory test(part one)		Results options	Response	
			F	%
1	**Blood group**	Yes	39	39.0
		No	**61**	**61.0**
2	**HCT/Hb**	**Yes**	**52**	**52.0**
		No	48	48.0
3	**Urine**	**Yes**	**63**	**63.0**
		No	37	37.0
4	**CBC**	**Yes**	**86**	**86.0**
		No	14	14.0
5	**BT**	Yes	33	33.0
		No	**67**	**67.0**
6	**PT**	Yes	30	30.0
		No	**70**	**70.0**
7	**PTT**	Yes	29	29.0
		No	**71**	**71.0**
8	**Viral Marker**	Yes	39	39.0
		No	**61**	**61.0**

Table 6 shows that, there are 9 types of laboratory test part two also that applied in preparing, the more common of the result it is by the Bun: creatinine in the first rink about (82%).

Table 6: Distribution of the result according to Laboratory test (part 2)

Laboratory test(part tow)		**Results options**	**Response**	
			F	**%**
1	**Na**	**Yes**	**77**	**77.0**
		No	23	23.0
2	**K**	**Yes**	**73**	**73.0**
		No	27	27.0
3	**CI**	Yes	**36**	36.0
		No	**64**	**64.0**
4	**Glucose**	Yes	38	38.0
		No	**62**	**62.0**
5	**Bun: creatinine**	**Yes**	**82**	**82.0**
		No	18	18.0
6	**Other**	**Yes**	**50**	**50.0**
		No	50	50.0
7	**ECG**	**Yes**	**65**	**65.0**
		No	35	35.0
8	**Chest X-Ray**	**Yes**	**80**	**80.0**
		No	20	20.0

5.6 Distribution of the result according to types of premedication

Table 7 shows that, the more common of the result to types premedication it is of the analgesics about (65%) than followed by anxiety about (55%) and only the less common it is by the anti-cholinergic about (7.0%).

Table 7: Distribution of the result according to types premedication

Types premedication		**Results options**	**Response**	
			F	**%**
1	**Anxiety**	**Yes**	**55**	**55.0**
		No	45	45.0
2	**Amnesia**	Yes	40	40.0
		No	**60**	**60.0**
3	**Anti-emetic**	Yes	28	28.0
		No	**72**	**72.0**
4	**Anti-Acid**	Yes	14	14.0
		No	**86**	**86.0**
5	**Anti-cholinergic**	Yes	**7**	7.0
		No	**93**	**93.0**
6	**Analgesics**	**Yes**	**65**	**65.0**
		No	35	35.0

5.7 **Distribution of the result according to types of anesthetic plan**

Table 8 shows that, the more common of the types of anesthetic plan is the patient consent about (96%) and followed by general anesthesia about(94%) and only of the less common is special techniques about (2%).

Table 8: Distribution of the result according to types of anesthetic plan

anesthetic plan		Results options	Response	
			F	%
1	**General anesthesia**	**Yes**	**94**	**94.0**
		No	6	6.0
2	**Regional Anesthesia**	Yes	7	7.0
		No	**93**	**93.0**
3	**Monitored anesthesia care**	Yes	7	7.0
		No	**93**	**93.0**
4	**invasive monitors**	Yes	4	4.0
		No	**96**	**96.0**
5	**special techniques**	Yes	2	2.0
		No	**98**	**98.0**
6	**ASA class**	Yes	13	13.0
		No	**87**	**87.0**
7	**Patient consent**	**Yes**	**96**	96.0
		No	4	4.0
8	**signature of anthologist**	Yes	5	5.0
		No	**95**	**95.0**

CHAPTER SIX: Discussion

6.1 Discussion

Coming to analyze result specifically focused on anesthesia practice, a catastro phic numbers were found, which reflect the disastrous situation in term of patient safety in our country. For instance in distribution of the result according to types of anesthetic plan table (8) only 7 patients had anesthetic monitor care according ASA standers, this is usually because of a absence of one or more devices in our hospitals such as capnography or pulse oximetery or even temperature prop. Lega lly anesthesiologist and anesthesia stuff must be blame in such big deficit because they will not be in safe side if patient`s life become in risk or complications occur red during or after operation. Standers & laws in general or private hospital are al ways exist in form of protocols and strategies but it would not never apply unless in rare conditions.

In comparing with Responses to Survey Questions to Prioritize the Content of a Template for Inclusion on a Pre-anesthetic Induction Patient Safety (PIPS) Che cklist (Robert K. Stoelting). APSF Survey Helps To Establish Pre-Induction Che cklist), only 79.3% of responses believe that verify monitors are functioning wav e forms are present if appropriate and the audible and visual alarms are set "whic h all a part of ASA standers", has high priority whereas 13.3% responded it has lo w priority. This study was done among stuff with 80% of them had more than 10 year experience, this is reflects one fact that’s many anesthesia stuff specially old classic practitioner do not believe technology or they do not care.

In our situation further studies should be done to find out why these simple standers is not applied, in parallel, steps should be achieved to educate anesthesia stuff and all involved personal to apply such standers legally.

ASA classification result also has the same sad story, only 13 patients (13%) had been classified. Surly if we asked any anesthesia stuff about importance of th is classification, no one will ignore it, but this result tell us how big the problem in our hospitals is.

ASA classification give the anesthesiologist an expectation of morbidity and mortality of patient, which by involve patients or relatives before operation can s olve the problem of poor-trust between Yemeni physician and their patients.

On the other hand a significant number of patients (94%) in our study had con sent, which is a part of legal documentation. This high percentage tell us routine papers can be introduced to our stuff and applied simply if they been touch about their importance. Routine check list should be the next in our plan.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION

7.1 Conclusion

- The study aimed to the assessment application of anesthesia checklist for patient undergoing operation room in public hospital in Sana'a city- Yemen
- It is provided with a first analysis on data obtained through questionnaires

We conclude that;

- The most of Participants were female 51%
- The majority of study participant with age ranged between 21-40 was 41%
- Regarding to medical history 49% of anesthesiologist concerned on other than main history.
- Regarding to previous anesthetic 71% of anesthesiologist were asked the patients about previous operation and anesthetics.
- Regarding to physical examination 100% of anesthesiologists were taken the vital signs.
- Regarding to laboratory test done 86% of anesthesiologists were checked the (CBC) results.
- Regarding to laboratory test done only 39% of anesthesiologists were checked the viral markers.
- Regarding to laboratory test part two 82% of anesthesiologists concerned were checked creatinine.
- Regarding to types of premedication 65% of anesthesiologists were given the patients analgesic.
- Regarding to types of premedication only 55% of anesthesiologists were given the patients drugs for anxiety.
- Regarding to types of premedication only 40% of anesthesiologists were given the patients drugs for amnesia.
- Regarding to types of anesthetic plan 96% of anesthesiologists were assured that the patients signed on patient consent form.
- Regarding the types of anesthesia most of them was General anesthesia about 94%.
- Regarding the types of anesthesia only 7% had monitored by stander ASA.
- Regarding to types of anesthesia only 13% of patients had ASA class.
- Only 5% of anesthesiologist put their signature.

7.2 Recommendations

These current steady recommended:

1. Further researches were needed includes more cities in Yemen.
2. Apply standard assessment application of anesthesia checklist
3. Find out strategy that make guideline for preoperative assessment to patient under operation, to improve quality
4. Anesthesia work the must have a great responsibility to maintain the best car for all patient under anesthesia operation
5. Forced on continues education training regarding to assessment application of anesthesia operation undergoing in public hospital in Sana'a-city
6. The establishment of seminars and workshops for anesthesiologists to acquaint them with the risks of not paying attention to taking the patient's history and the legal aspects that may ensue.

References

Ronald D.Miller,Lars I. Eriksson,et al,Miller's Anesthesia, 7th Edition 2010 vol(2), chapter 6, page 1155.

Jonathan R. Treadwell, Scott Lucas,et al , Preoperative Checklists and Anesthesia checklist

Stander SE, Mahajan RP, Anesthesia and patient safety: have we reached our limits, Curr Opin Anesthesiol, 2011 Jun;24(3):349-53,{PubMed:21330916}

Haynes AB, Weiser TG, Berry WR, Lipsitz SR, Breizat AH, Dellinger EP, Herbosa T, Joseph S, Kibatala PL, Lapitan MC, Merry AF, Moorthy K, Reznick RK, Taylor B, Gawande AASafe Surgery Saves Lives Study Group. Safe Surgery Saves Lives Study Group. . A surgical safety checklist to reduce morbidity and mortality in a global population. N Engl J Med. 2009;360:491–9

Agarwala AV, Firth PG, Albrecht MA, Warren L, Musch G. An electronic checklist improves transfer and retention of critical information at intraoperative handoff of care. Anesth Analg. 2015;120:96–104

Arriaga AF, Bader AM, Wong JM, Lipsitz SR, Berry WR, Ziewacz JE, Hepner DL, Boorman DJ, Pozner CN, Smink DS, Gawande AA. Simulation-based trial of surgical-crisis checklists. N Engl J Med. 2013;368:246–53

Tan JA, Helsten D. Intraoperative handoffs. Int Anesthesiol Clin. 2013;51:31–42

Petrovic MA, Martinez EA, Aboumatar H. Implementing a perioperative handoff tool to improve postprocedural patient transfers. Jt Comm J Qual Patient Saf. 2012;38:135–42

Perrow C Normal Accidents: Living with High-Risk Technologies. 1984 New York Basic Books

Webster CS, Stabile M, Merry AF. The challenges of technological intensification. APSF Newslett. 2009;24:33–5

Demaria S Jr, Blasius K, Neustein SM. Missed steps in the preanesthetic set-up. Anesth Analg. 2011;113:84–8

Thomassen Ø, Brattebø G, Søfteland E, Lossius HM, Heltne JK. The effect of a simple checklist on frequent pre-induction deficiencies. Acta Anaesthesiol Scand. 2010;54:1179–84

Craig J, Wilson ME. A survey of anaesthetic misadventures. Anaesthesia. 1981;36:933–6

Cooper JB, Newbower RS, Kitz RJ. An analysis of major errors and equipment failures in anesthesia management: considerations for prevention and detection. Anesthesiology. 1984;60:34–42

Cooper JB, Newbower RS, Long CD, McPeek B. Preventable anesthesia mishaps: a study of human factors. Anesthesiology. 1978;49:399–406

Stoelting RK. APSF survey helps to establish pre-induction checklist. APSF Newslett. 2013;28:11–3

Bhananker SM, Ramamoorthy C, Geiduschek JM, Posner KL, Domino KB, Haberkern CM, Campos JS, Morray JP. Anesthesia-related cardiac arrest in children: update from the Pediatric Perioperative Cardiac Arrest Registry. Anesth Analg. 2007;105:344–50

Krombach, Jens W. MD,et al, Anesthesia & Analgesia: October 2015 - Volume 121 - Issue 4 - p 1097–1103, doi: 10.1213/ANE.0000000000000923

Roizen MF, Foss JF, Fischer SP. Preoperative evaluation. In: Miller RD, editor. Anesthesia. 5th Edition. Philadelphia: Churchill-Livingstone; 2000. pp. 824–883.

Hippokratia et.al. Preoperative evaluation and prepration for anesthesia and surgery.2007 Jan-Mar,11(1):13-21 PMCID:PMC2464262

Appendix A

English version

Questionnaire about

Application of Pre -Anesthesia checklist in Patients Undergoing Operation in Public Hospitals in Sana'a City-Yemen

PATIENT'S NAME: AGE: SEX: M F

PROPOSED OPERATION: DATE: TIME: HT: PREOP DIAGNOSIS: WT:

MEDICAL HISTORY: YES NO

MEDICAL HISTORY	YES	NO	NOTES
ALLERGIES			
INTOLERANCES			
DRUG USE			
PRESENT PROBLEM:			
CARDIOVASCULAR			
RESPIRATORY			
DIABETIC			
NEUROLOGIC			
RENAL			
HEPATIC			
ARTHRITIS			
MUSCULO SKELETAL			
OTHER			

PREVIOUS ANESTHETICS: YES NO

PREVIOUS ANESTHETICS	YES	NO	NOTES
PREVIOUS OPERATION ANESTHETICS AND			
FAMILLY HISTORY			
LAST ORAL INTAKE			
PREVIOUS ALLERGIES FROM ANESTHETIC DRUG			
FAMILLY HISTORY OF PREVIOUS ALLERGIES FROM ANESTHETIC DRUG			

PHYSICAL EXAMINATION: YES NO

PHYSICAL EXAMINATION	YES	NO	NOTES
VITAL SIGNS			
HEART			
LUNGS			
AIRWAY			
EXTREMITIES			
NEUROLOGIC			
TEETH			

LABORATORY TEST: YES NO

LAB TEST	YES	NO	NOTES
BLOOD GROUB			
HCT/Hgb			
URINE			
CBC			
BT			
PT			
PTT			
VIRAL MARKER			
ELECTROLYTE	YES	NO	NOTES
Na			
K			
CO2			
Cl			
GLUCOSE			
BUN:CREATININE			
OTHER			
ECG			
CHEST X-RAY			
FUNCTION OF SYSTEMS			

PREMEDICATION: YES NO

PREMEDICATION	YES	NO	NOTES
ANXIETY			
AMNESIA			
ANTI EMETIC			
ANTI ACID			
ANTI CHOLINERGIC			
ANALGESIC			

PLAN OF ANESTHETIC: YES NO

PLAN	YES	NO	NOYES
GENERAL ANESTHESIA			
REGIONAL			
MONITORED ANESTHESIA CARE			
INVASIVE MONITORS			
SPECIALTECHNIQUES			
ASA CLASS			
PATIENT CONSENT			
SIGNATURE OF ANESTHELOGIST			

Appendix B: Consent form