

## Risk and Mortality in Anaesthesia among patients in Jeddah, Saudi Arabia

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### Abstract

The rates of mortality and morbidity related to anesthesia were checked on. The majority of the distributed occurrences for basic inconveniences of anesthesia fluctuate extensively. Where conceivable, a reasonable gauge of the occurrence of every morbidity has been made, in light of the best accessible information. View of risk and correspondence of sedative hazard to patients are talked about. The occurrences of analgesic confusions are contrasted and the relative dangers of regular occasions, utilizing a group bunch logarithmic scale, keeping in mind the end goal to put the risk in context when contrasted and different entanglements and with the intrinsic risks of surgery. Documentation of these dangers and discourse with patients ought to enable them to be better educated about the relative dangers of sedative difficulties. Contingent upon particular comorbidities and the seriousness of operation, these dangers related with anesthesia may increment for any one person.

**Keywords:** Anaesthesia; Risk; Mortality; Morbidity; Perioperative

### Introduction

In view of results recorded of perioperative mortality, anaesthetic care is regularly referred to as a model for its changes with respect to understanding security. Be that as it may, anesthesia-related morbidity speaks to a noteworthy weight for patients up 'til now disregarding significant advances in this field ever since the early 1980s. More than 1 out of 10 patients will have an intraoperative occurrence and 1 out of 1000 will have damage, for example, a dental harm, an incidental dural puncturing, a fringe nerve harm or real torment. Poor preoperative patient assessment and postoperative care frequently add to complexities. Human blunder and insufficient cooperation are as often as possible recognized as significant reasons for disappointments. To additionally enhance sedative care, high-chance specialized strategies ought to be performed after methodical preparing, and further consideration ought to be focused on preoperative appraisal and

post-analgesic care. To limit the effect of human blunders, rules and institutionalized methods ought to be generally executed. Lacking collaboration and correspondence ought to be tended to through particular projects that have been exhibited to be viable in the flight business: crew resource management (CRM) and reenactment. The effect of the general wellbeing society of medicinal services associations on anesthesia ought not to be limited, and hierarchical issues ought to be methodically tended to. The dangers related with anesthesia have for quite some time been perceived and anesthesia is regularly referred to as a model for its accomplishments in the field of patient-security improvements [1]. One of these changes is the nonstop checking of unfavorable results following anesthesia and the orderly advancement of methodologies to limit the antagonistic outcomes. This audit article compresses the significant discoveries of current epidemiological examinations giving an account of anesthesia-related mortality and horribleness and distinguishes certain techniques that are every now and again prescribed to limit the event of unfriendly results [2].

Anaesthesia means loss of sensation. If you have ever had a dental injection in your mouth or pain-killing drops put in your eyes, you now know significant things about anaesthesia. It stops you feeling pain and further sensations; it can be given in several ways; not all anaesthesia makes you unconscious; it can be directed to different parts of the body. Drugs that cause anaesthesia work by blocking the signals that pass along your nerves to your brain. When the drugs wear off, you start to feel normal sensations again, including pain.

### **Various forms of anaesthesia**

Local anaesthesia, a local anaesthetic numbs a little part of your body. It is utilized when the nerves can certainly be reached by drops, sprays, ointments or injections. You remain cognizant however free from torment.

Regional anaesthesia, Regional anaesthesia can be utilized for operations on bigger or more profound parts of the body. Local anaesthetic medications are injected near to the bundles of nerves which move signals from that part of the body to the brain. The most widely recognized regional anaesthetics (also recognized as regional blocks) are spinal and epidural anaesthetics. These can be utilized for operations on the lower body, for example, Caesarean sections, bladder operations or supplanting a hip joint. You remain cognizant however free from torment.

General anaesthesia, General anaesthesia is a condition of controlled unconsciousness for the period of which you don't feel anything and might be depicted as anaesthetised. This is basic for a few operations and might be utilized as a contrasting option to regional anaesthesia for others. Anaesthetic drugs injected into a vein, or anaesthetic gases inhaled into the lungs, are conveyed to the brain by the blood. They stop the brain perceiving messages originating from the nerves in the body. Anaesthetic unconsciousness is not quite the same from unconsciousness because of ailment or injury and is different from sleep. As the anaesthetic drugs wear off, your awareness begins to return.

### **Anaesthesia-related mortality**

The estimation of anesthesia-related mortality has been utilized since the center of the nineteenth century. Anesthesia-related mortality is characterized as patients biting the dust under, or following, the care of an anesthetist. Studies have been distributed all the time and utilized as an intermediary to quantify tolerant wellbeing in anesthesia. A portion of the biggest and most understood examinations incorporate the audit of anesthesia-related mortality in the vicinity of 1997 and 1999 in Australia [3], the National Confidential Enquiry into Peri-Operative Death (NCEPOD) in the United Kingdom [4], the anesthesia-related mortality and bleakness over a 5-year time span in 2,363,038 patients in Japan [5], the Canadian four-focus investigation of sedative outcomes [6], the imminent study of confusions related with anesthesia in France, the mortality related with anesthesia in an examination led in South Africa [7], the investigation of passages related with anesthesia in Finland, the anesthesia-related-mortality appraisal performed in an investigation in New Zealand [8] and the examination on the avoidance of intraoperative soporific mishaps and related extreme damage through security checking in the United States. These investigations finish the perceptions revealed by a few others from the nineteenth century onwards, and add to give an astounding photo of the decrease in anesthesia-related mortality all through the twentieth century. For instance, toward the finish of the nineteenth century, 1/900 patients kicked the bucket because of their anaesthesia. In the late 1950s, anesthesia-related mortality was

much lower and run from 3.1/10 000 to 6.4/10 000 after the organization of anaesthetics. During the most recent three decades, mortality figures related with anesthesia dropped to 0.04 - 7 for every 10 000 patients directed anaesthetics [9]; this speaks to a 10-overlay diminish in the anesthesia-related death rate since the 1980s. Accordingly, anesthesia is regularly referred to as the main claim to fame in social insurance to have achieved the six-sigma imperfection rate. A six sigma prepare is characterized as one in which 99.99966% of the 'finished results' are factually free of imperfections (3.4 deformities for each million) [10] Is this truly genuine?

There are huge impediments in utilizing anesthesia-related death rates to quantify and decide the level of wellbeing in anesthesia. Accordingly, the previously mentioned figures ought to be translated with alert. The primary issue is the absence of an institutionalized meaning of anesthesia-related mortality. For a few creators, this term incorporates principally perioperative demise to which human blunder with respect to the anesthesia supplier has contributed. For others, anesthesia-related mortality alludes to all potential reasons for passings happening amid or following anesthesia, incorporating those related with both sedative and surgical factors [11]. Moreover, there is an absence of agreement concerning the general timeframe following anesthesia that when anesthesia-related mortality can be characterized. Contingent upon thinks about, this period can change between 24h and 30 days following a sedative procedure [12]. This variety significantly affects pervasiveness assessments of anesthesia-related mortality.

There have been a few endeavors to recognize an accord definition such as, in 1985, when a few specialists in an International Symposium in Vancouver characterized soporific mortality as "death which happened before recuperation from the impacts of a medication or medications given to calm the agony of a condition or emerging from an episode which happened while the medication was compelling." However, this definition and others that took after have never been generally acknowledged or proclaimed adequately to wind up norms in reports and investigations of anesthesia-related mortality. Another impediment identifies with the companion survey handle itself. To decide if demise is related with anesthesia, singular cases are frequently surveyed by a board of specialists. There is a critical level of changeability among analysts concerning reasons for unfavorable results. Certain examinations found that the level of ascension between analysts in regards to the standard of care was, now and again, just imperceptibly superior to coincidental [13]. As a result, there exists some instability concerning the real figures of anesthesia-related mortality. The fourth confinement identifies with the estimation of the denominator of the condition. Most investigations utilize coroners' registries, intentional reports, reviews and negligence guarantees as their principle information hotspot for perioperative passing. As a result, the denominator of the mortality condition – the general number of patients anesthetized – is obscure. Regularly, approximations of the general number of patients experiencing a surgical technique where anesthesia is probably going to have been utilized, or gauges of releases from open and private healing centers, are utilized. Thus, predominance information accessible for anesthesia-related mortality is rough gauges. This has prompted a few debates rising in the analgesic literature [14]. Finally, anesthesia-related mortality does not precisely reflect quiet security amid anesthesia, which is to "guarantee that no patient ought to be hurt by anesthesia," as built up by the Anesthesia Patient Safety Foundation. Furthermore, hurt incorporates anesthesia-related dreariness, which ought to be investigated together with anaesthesia related mortality keeping in mind the end goal to evaluate the genuine level of patient wellbeing amid anesthesia.

### **Anaesthesia-related morbidity**

Anaesthetic morbidity (characteristic of illness – The Oxford Dictionary of Science and Medicine) consolidates any entanglement, barring demise, happening amid the perioperative period [15]. It can be ordered into three gatherings: 1) Minor dismalness: Moderate pain without prolongation of doctor's facility stay or lasting sequelae (e.g., postoperative nausea and vomiting (PONV)). 2) Intermediate bleakness: Serious trouble or prolongation of healing center stay, or both, without changeless sequelae (e.g., dental damage). 3) Major bleakness: Permanent inability and sequelae (e.g., spinal cord damage). Heart failures and extreme lethargies are the most generally connected horribleness related unfriendly results utilized to gauge quiet security. Since real dreariness, for example, heart failures or trance state can frequently prompt passing, these unfriendly results have regularly been broke down inside investigations taking a gander at anaesthesia related mortality. The present pervasiveness of anesthesia-related heart failures is in the vicinity of 0.8 and 3.3/10 000 soporifics controlled, and the predominance of anesthesia-related mind wounds is in the vicinity of 0.15 and 0.9/10,000 [5]. These are nearly trailed

by other neurological confusions that happen resulting to anesthesia. Paraplegia auxiliary to spinal or epidural anesthesia happens at the rate of 0.6 - 0.9 for each 100 000 patients; be that as it may, neuropathy following fringe nerve bar is available in around 3% of patients, with the majority of these recuperating after a little while or months. Ulnar neuropathy after anesthesia and surgery, comprising for the most part of one-sided paraesthesias of the ring and little finger, can be available in 0.5% of patients, with leftover side effects enduring up to 2 years after the fact in 0.2% of patients. After anesthesia and surgery in lithotomy positions, bring down limit neuropathies are distinguished in 1.5% of patients; notwithstanding, indications resolve in many patients inside 6 months [16].

The frequency of unfavorable results with intermediate or low morbidity is high. Fasting and Gisvold, found a general occurrence of minor anesthesia-related, perioperative episodes in the vicinity of 18% and 22% [17]. Minor occasions, for example, roughness of voice following tracheal intubation, happening inside 24 h postoperatively, have been accounted for in 14–50% of patients. These may go with a horrendous sore of the larynx or hypopharynx in 6.3% of patients. The similar holds true for dental damage requiring further dental intercessions that happen in one patient for every 1000 - 2073 [18]. Furthermore, blunders related with medicate organization are visit and happen in 0.1% of sedative administrations. what’s more, risky execution of analgesic gear have been appeared to happen in 0.23% of patients amid general anesthesia and in 0.05% amid territorial anesthesia; 33% of these issues was identified with the soporific machine, and one-quarter to human error [19]. Accidental dural aperture amid epidural anesthesia happens in 0.5 - 0.6% of obstetrical anaesthesias [20]. PONV is the most regular antagonistic result. Contingent upon the nearness of hazard components for PONV, it can happen in 10 - 79% of analgesic procedures [21]. Therefore, if morbidity is involved in the definition of injury caused by anaesthesia, opposite results are much more frequent and anaesthesia appears to be far from 99.99966% free of defects (Figure 1).

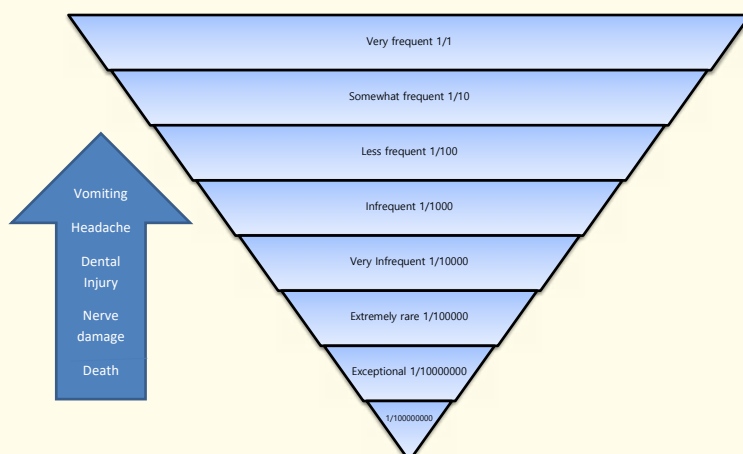


Figure 1: Anaesthesia morbidity.

Nevertheless, when taking a gander at the advancement of grimness in the course of the most recent decades, an indistinguishable level of change from the one watched for anesthesia-related dismalness can be recognized. For example, heart failures following neur-axial anesthesia have been split in the vicinity of 1970 and 1990 [22]. The same is valid for mindfulness amid obstetric anesthesia, which diminished from 1.3% to 0.4% in the vicinity of 1982 and 1989. Claims for nerve wounds have been accounted for to diminish from 37% to 17% in the vicinity of 1980 and 1990.46 once more, these figures ought to be translated with alert. They experience the ill effects of comparative restrictions as figures given by anesthesia-related mortality thinks about: absence of clear meaning of the antagonistic result measured and absence of accord in the matter of what characterizes the perioperative period. Moreover, as these results are not, without anyone else, measures of patient security, they should be additionally examined and deciphered by spectators or commentators keeping in mind the end goal to decide if the unfavorable result portrayed is identified with medicinal services administration instead of patients’ conditions and whether a mistake or a deviation from standard of care has happened. At exactly that point can the unfavorable result be

considered as a genuine measure of patient security and the commonness of wellbeing issues in anesthesia is dependably decided. The dependability of the associate survey prepare has been scrutinized a few times, and the primary constraint of this strategy is choice, data, review and knowledge predisposition from unblinded reviewers. Nevertheless, they show that iatrogenic complexities following anesthesia are not uncommon and, in spite of the fact that the circumstance may have enhanced since the 1970s, there is as yet far to go to achieve the six-sigma imperfection rate.

### **Risks of mortality and morbidity in anaesthesia**

Anesthesia stays risky, especially in a particular number of methodologies, for example, aviation route control amid general anesthesia, intra- and post-agent administration of discharge and circulatory unsettling influences related with local anaesthesia [23]. These can bring about serious difficulties or even demise. Some of extra exercises, for example, central venous catheter (CVC) arrangement, the utilization of implantation pumps and the organization of medication add to expanding morbidity [19]. Unfriendly results happen amid the intraoperative period as well as because of exercises performed by anesthetists amid the pre- and post-agent periods. Preoperatively, problematic care identified with lacking patient assessment or off base preoperative administration, has been observed to be a noteworthy contributing element in 38 - 42% of deaths [22,24]. Whereas respiratory misery has turned out to be greatly uncommon amid the postoperative period with the advancement of post-anaesthesia care units (PACUs), different components, for example, imperfect administration of postoperative blood misfortune, deficient supervision of care-colleagues or insufficient revival techniques still add to 43% of anesthesia-related deaths. Therefore, the principal message is that future endeavors should go for enhancing anesthesia wellbeing amid the intraoperative period, as well as amid the pre- and postoperative periods. Another reason for antagonistic results identifies with human mistake. Human disappointments have been recognized in 51 - 77% of anesthesia-related deaths [23].

Most cases are identified with absence of experience or fitness, which have been seen in 89% of human-disappointments related deaths, and, less as often as possible, blunders of judgment or investigation, distinguished in 11% of these deaths. Thus, great practices clinical rules may fundamentally enhance hone. Clinical rules can be characterized as efficiently created explanations that help clinician choices about proper social insurance for particular clinical conditions. There are three unique sorts of rules [25]:

- Conventions – strict tenets to be followed in detail with little space for inconstancy
- Agreement rules – an arrangement of best practices proposals created on a specialist based help.
- Prove based rules – an arrangement of suggestions in view of a precise recovery and examination of data from the logical writing including the rating of the quality of the evidence.

Protocols are the most formalized technique for procedure based systems and are near the approach found in the business. They are typically utilized as a part of high-hazard territories, for example, crisis revival or heart anesthesia. Guidelines denote a weaker kind of technique based methodology and seem more as efficiently created articulations to help clinicians as opposed to formal strides to control a demonstrative or treatment prepare. Rules are accessible from proficient associations and medicinal services legislative organizations or can be found in the scientific medical literature.

Even though guidelines have shown some effectiveness in enlightening patient safety in anaesthesia, the low level of compliance with guidelines is disturbing, although this is not a phenomenon specific to anaesthesia [26].

To start with, strategies and rules intrinsically challenge proficient independence. Medical knowledge is complex and sets aside a long opportunity to obtain. This unavoidably brings about expert control of the idea of clinical work and the association with patients. The utilization of predefined methods challenges this self-sufficiency and is frequently seen as (cook-book drug) by numerous anesthetists. This might be credited to their modern roots in view of a formal, systematic, hierarchical structure for clinical work. Truly, clinical work in anesthesia, especially amid crisis circumstances, is a long way from being straight and normal. This adds to the poor notoriety of rules and conventions among anesthetists. Second, while surveying rules all the more particularly, it gives the idea that there is an extensive number of rules accessible from an extensive variety of sources which might be deficient, obsolete or have clashing suggestions. At last, their

appropriation depends generally on aloof dispersion while contemplates demonstrate this is frequently an exceptionally poor approach to empower changes in proficient practice [27]. Therefore, the second message is that human mistake is a key component prompting unfavorable results and rules have an awesome potential to limit blunders, especially those related with an absence of experience or ability. In any case, there are noteworthy hindrances to their wide usage and future endeavors should go for better comprehension of these snags to create systems that can beat them. Another reason for unfavorable results identifies with poor collaboration and correspondence. These variables have been appeared to add to 43 - 65% of sentinel occasions happening in working theaters (e.g., operation on the wrong side, transfusion blunder, off base organization of potassium chloride) [28]. Teamwork has been distinguished as being lacking in 62% of passages, for the most part correspondence breakdown (oral correspondence in 36% and composed correspondence in 20%), or poor supervision and nonappearance of assistance when required (in 44% of failures). These troubles in correspondence were affirmed in an examination by Arbous, *et al.* demonstrating that the danger of anesthesia-related mortality was diminished when a senior anesthetist was accessible and could be achieved (chances proportion (OR): 0.45), when there was no intraoperative change of anesthetist, lessening the requirement for exchange of data (OR: 0.44) and when two people were available amid the start and end of anesthesia (OR: 0.69) [17-19]. These discoveries affirm different reports that recognized the significance of working room cooperation, which ought not be viewed as confined to anesthesia parental figures, but rather should likewise incorporate the surgical and working room nursing faculty. In an extensive overview, Davenport and partners found that with better correspondence and cooperation of the working room mind group, the rate of postoperative complexities was lower [29].

There are numerous approaches through which teamwork and communication can be enhanced. The most famous are CRM and Simulation. Both approaches have been developed in the aviation industry and have increasingly been used in health care since the end of the 20<sup>th</sup> century. This concept has gradually been integrated into the medical field following the pioneering work done in the late 1980s at the Stanford University by Gaba and colleagues [30]. The CRM technique targets at developing shared performances to improve patient safety (team resources rather than individual resource). There is no unique format for CRM programmes, and these can vary depending on individual organisational needs. Nevertheless, all programmes address issues in the following areas: communication, coordination, leadership and human factors leading to errors [31]. They are intended to: Improve initiative (everybody must have the capacity to propose arrangements, change of limit administration, and so on.); Awareness of the hazard circumstance (gather and sort data, distinguish needs, and so forth.); Stress administration (recognizing stressors, propose aggregate arrangements, organize alternatives in view of hazard, assess accessible decisions, and so forth.); Management of 'core abilities' (look after principles, distinguish and utilize accessible assets, and so on.); Teamwork (make a dream and group flow, convey and facilitate exercises, and so on.); Communication (trade of data, receive powerful correspondence techniques, and so forth).

Managerial factors have been recognized as having contributed to 26% of deaths and severe morbidity. They comprised of: insufficient coordinating between the required assets and the patients' condition seen in 38% of deaths, lacking surgical planning for 31%, creation weight in 20% and unseemly night-call association in 11% [23]. This recommends efforts to enhance tolerant wellbeing amid anesthesia ought not to be solely coordinated to enhancing singular fitness but rather likewise should address improvement of associations themselves. Once more, aeronautics has driven the path with another approach called 'wellbeing administration'. To start with said in the mid-1990s, security administration has developed from the possibility that safety should be managed to the idea of safety-management systems [32].

## Conclusion

Insurance percentages for anaesthetists have remained steady or have reduced in European or North American countries in recent years. This is obviously due to a reduction in the number of main accidents associated with anaesthetic care. Nevertheless, while anaesthesia can claim successes in decreasing the number of main adverse consequences including death, anaesthesia-related morbidity still remains significant. Human errors, poor teamwork and organisational failures play an important part in contributing to adverse results. Conservative development approaches such as the development of new and safe anaesthetic agents or advanced monitoring have limited

impact. Furthermore to minimal standards for anaesthetic practice and strict regulation of staff qualifications, the next developments in anaesthesia safety should consider the following interferences: Reduce difficulties of procedures that remain high risk (such as airway control, intra- and postoperative management of haemorrhage, preoperative evaluation, etc.) through simulation; Minimise human errors (in particular, those associated with a lack of experience or capability leading to deviations from recommended practice in patient care) by the systematic use of good practice clinical guidelines and standardisation of work practices; Develop communication and teamwork between the different caregivers within the anaesthetic team and among anaesthetists, surgeons and operating-room nurses through CRM programmes; Decrease structural failures by implementing safety-management systems developed within the aviation industry.

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