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Editorial comment

The most important step forward in modern medicine, "a giant leap for mankind": Insensibility to pain during surgery and painful procedures

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In this issue of the *Scandinavian Journal of Pain*, Maurice S Albin focuses on the most important discovery in modern medicine, namely painless surgical operations [1]. Only one month after the successful demonstration of ether (diethyl-ether) inhalation, making a patient insensible to pain during a surgical operation on October 16, 1846, Henry Jacob Bigelow published the most important paper during the 200 years of publication of the New England Journal of Medicine [2]. Bigelow described the demonstration of ether anaesthesia in the operating theatre of the Massachusett General Hospital (later named "The Ether-Dome"), by the dentist William Morton, using strong superlatives:

> "It has long been an important problem in medical science to devise some method of mitigating the pain of surgical operations. An efficient agent for this purpose has at length been discovered. A patient has been rendered completely insensible during an amputation of the thigh, regaining consciousness after a short interval. Other severe operations have been performed without the knowledge of the patients. So remarkable an occurrence will, it is believed, render the following details relating to the history and character of the process, not uninteresting".

And indeed it was not uninteresting: The news spread around the world so rapidly that ether anaesthesia was practiced early in 1947 in many parts of the world, even in Australia several months away by boat from the rest of the world at the time.

In 2012, on celebrating its 200 years history of publishing medical science papers, a survey among the readers of the *New England Journal of Medicine* by a large majority voted for the Bigelow paper from November 1846 as the most important publication during the previous 200 years. Modern medicine would not be what it is today without the drugs and means of making patients insensible to pain, nausea, dyspnoea, anxiety, "stress", and all other conscious and unconscious reactions to severe trauma and tissue injuries during surgery, as well as during all painful and burdening procedures of examinations and treatments that are necessary in the practice of modern medicine [3].

1. "A leap forward for humanity"

The leap forward in the practice of clinical medicine caused by the demonstration of ether-anaesthesia in 1846 "changed not just the future of surgery but of medicine as a whole" [3]. Chloroform was discovered in 1847 [4]. Both inhalation agents were used for the relief of labour pain, chloroform in particular became popular in England after Queen Victoria accepted chloroform analgesia by the anaesthetist John Snow for the birth of her 8. child in 1853: "*..he gave that blessed chloroform and the effect was soothing, quieting, delightful..*". This "Chloroform à la Reine" had a major impact on acceptance of relief of labour pain. For well-known reasons, the "Church" was adamantly against any type of pain relief during birth of a baby. Unbelievably, resistance against pain-free surgical operations was voiced from surgeons at the time [3]. They believed that the "stimulation from the knife" mobilized endogenous forces that helped patients survive the stress of surgery [1,3].

2. Why is effective postoperative pain relief not given priority today?

Unfortunately, such convictions exist even today, but now mostly concerning postoperative pain. Some consider even labour pain a necessary part of a normal delivery. They believe that pain-free labour deprives the parturient of an important part of bearing a baby into this world.

3. Serious adverse effects of pain-free surgery can be avoided by well trained anaesthisa providers

Too much of a good thing is seldom good. This is particularly true of anaesthesia and analgesia. Surgical deaths, in which anaesthesia is a major cause, were significant problems before specialists in anaesthesiology appeared [3]. Early on, medical students, nurses, and nurses' assistants, all without proper training in maintaining open and free airways, administered ether or chloroform anaesthesia. Clearly, obstructed upper airways caused

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insufficient respiration, respiratory acidosis, hypoxia, and fatal outcomes. Unbelievably, but due to ignorance, the patient was blamed for this outcome. The bereaved were told: "The patient could not tolerate the anaesthetic."

Modern anaesthesia is anaesthesia with secured free airways. Anaesthesia-related mortality is about 2.5 per 100,000 patients having general anaesthesia for surgery or obstetric procedures (Bainbridge D et al. Lancet 2012;380:1075-81). Specific surgical mortality varies with type of surgery and amount of co-morbidity, but is around 1 per 100 non-cardiac surgical operations (Haynes AB et al. NEJM 2009;360:491-9).

4. Effective and safe postoperative pain-relief requires trained nurses and doctors

We have seen tragic complications of well-intended pain relief even in recent years. These complications are always due to overdose, lack of appropriate monitoring of respiration and oxygenation because of lack of knowledge and experience, and lack of appropriate procedures and equipment. The development of day-case or outpatient surgical procedures, all in order to save money, have left many patients struggling with sever postoperative pain at home. Although many hospitals deliver appropriate amounts of analgesic drugs and keep telephone contact with the patients, two scenarios are not uncommon: The patients have far from "good enough" pain relief, others are exposed to the possibility of taking too high doses.

5. Effective tools for pain-relief are two-edged swords that require competent nurses and doctors

Pain-medicine and anaesthesia have advance tremendously in the 150 years since the horrible scenario that Maurice S. Albin describes so dramatically of a soldier having his arm amputated without anaesthesia, without any pain relief [1]. However, effective analgesic drugs have dangerous adverse effects when given/taken in too large doses. Only well trained health care providers with appropriate time and equipment can do this effectively and safely for all patients, the very young and old, the very ill and feable patients, as well as those who leave the day-care unit soon after surgery [5]. All hospitals doing surgical procedures should have an Acute Pain Service, preferably as part of the hospital's Pain Clinic and Anaesthesia department. Only then can ALL patients safely benefit from this "leap forward for humanity" that happened when pain-free surgery was introduced in 1846 [1,5].

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