Changes in Beliefs about Death: The Role of Mechanical Ventilation, 1930-Present

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Outline

- How death used to be & death today
- Denial & fear of death (use of technology)
- History of mechanical ventilation
- The ‘Iron Lung’ & polio
- The role of mechanical ventilation in polio
- The evolution of mechanical ventilation post polio to present.
- Changing expectations (public & health care)
- Decision making & preparing for the future
How Death Used To Be

14th century

- Death viewed as inevitable and always present.
- ‘Tamed death’ where people knew that death was approaching.
- The dying in charge of their death and knew its protocol.
- Most deaths occurred at home.
- The death bed was open to everyone including children.

www.sonofthesouth.net/revolutionary-war/explo...
How Death Used To Be

18th Century to Present

• Death viewed as shameful and forbidden.

• Those surrounding the dying person tried to spare him and to hide his illness.

• Family members and friends assumed the burden of the dying person’s ordeal.

• The hospital was reserved as a shelter for the poor, but eventually transformed into a medical center for healing, where sick individuals struggled against death.

• In the 1930’s to 1950’s death was displaced from home to the hospital.
Death Today

- Viewed as a break in established order - a disturbance in our lives.
- A technical phenomenon obtained by a D/C of care, often determined by a doctor/health care team.
- In our modern society no one has the patience or strength to wait over a period of weeks for the moment of death which has lost part of its meaning.
- The exact moment of death is difficult to tell as death has been broken down by a series of little steps.
- The health care team often tries to find out from the patient/family an acceptable style of dying, although it is often what is acceptable by the survivors.
The “porn of death”

• Death has now become taboo in the 20th century & replaced sex as the forbidden subject.

• Previously children were taught that birth was associated with a stork delivering babies, but children were permitted to the bed of a dying person.

• Today children are taught about birth, but told that grandpa is resting in a beautiful garden among flowers, for fear that the truth would upset children.
Denial & Fear of Death

• We struggle to understand the experience of dying & we treat death as an unpleasant event that destroys our hopes and future.
• Death is inevitable & since we do not know its’ precise moment we are fearful of this uncertainty.
• Any talk of death is viewed as unhealthy & impolite.
• Death becomes a silent stalker to be feared & frowned on.
• We are uncomfortable that there is something in our lives we cannot control.

“It feels like people are always trying to avoid me.”
Technology & Death

- The more rapidly we acquire technology, the greater our fear of dying, as we place trust in a mechanical way of life to death.
- Technology tests our knowledge of person vs object, natural vs artificial & living vs dead.
- These lines have become even more blurred.
- Symptoms that are associated with disease are masked by technology.
- Ventilators are now smaller, quieter, efficient & don’t require much manipulation, thus decreasing its presence.
- We give technology human capacities.
- The prevalent western belief; technology = progress = good.
- Technology has improved lives, but has made professionals & patients dependant on it.
- Instead of accepting death, we challenge death.
- Death is kept at arm’s length with our technological skill, creating the false impression that death can be kept at bay.
- Technology cannot stop death, but only provide a temporary respite in avoiding death.
History of Mechanical Ventilation

1864- Alfred Jones built a body enclosing tank ventilator, which he obtained a patent for.
He claimed that his ventilator was a cure for paralysis among many other diseases.
Little did he know that his device would support paralyzed polio patients.
In the last 30 years of the 19th century, many experiments in artificial ventilation were carried out & new devices in ventilation were developed.
The ‘Iron Lung’

- World War 1 brought research in mechanical ventilation to a halt.
- After the end of the war, medical interest in the development in artificial airway ventilation emerged.
- The gas and electrical supply industries were disappointed with the methods of treating victims of electric shock & gas poisoning, so they enlisted two brothers, Cecil & Philip Drinker to make recommendations.
- In 1929 a negative pressure tank ventilator, the “iron lung” was created by the brothers & financially funded by the Consolidated Gas Companies of New York.
The ‘Iron Lung’

- Surrounded the patient with an airtight seal created by a padded sponge rubber collar around the patients’ neck and sealed at the end around the foot of a cot within the tank.

- It operated by intermittent ‘-’ pressure ventilation by alternating compression & relaxation that created respirations.

- It was bulky & expensive, but could sustain patients safely for a period of time.

- Major complications were aspiration & atelectasis.

- Use of the Drinker respirator became more common during and after the polio epidemics which swept across North America in the 1940’s & 1950’s.
Poliomyelitis

- Paralytic polio - one of the most feared diseases of the 20th century.
- Polio had existed for thousands of years, but did not appear virulent until the 1930's-1950's.
- Paralytic cases occurred in ~3-4% of all polio virus infections with varying degrees of paralysis.
- Polio initially seemed to affect the young, but during the epidemics in the 1950's began affecting older individuals.
- The disease was unpredictable - it struck all ethnic groups & social classes with epidemics usually striking in the late summer & early fall.
M.V. during the Polio Era

- Only treatment available for patients with paralytic spinal polio & respiratory failure was the ‘iron lung’.
- Even with the use of the iron lung mortality rates were still high.
- There were 4 waves of epidemics.
- Canada’s major epidemic was the fourth wave in 1953, with a national case rate of 60 per 100,000.
- The second wave in 1935-1940 had an increase in the # of cases with respiratory or throat paralysis.
- There became an increased need, but limited supply of these ventilators.
M.V. in the Polio Era

• The iron lung was one of the terrifying and worst effects of polio: indefinite confinement.

• Governments struggled with overwhelmed hospitals, iron lung shortages, nursing shortages, & the financial impact.

• There was never any question about removing a patient from the iron lung, except if they could breathe independently.

• It wasn’t until a vaccine for polio was used in the 1960’s, which seemed to eradicate most of the epidemics.

bulletin.aarp.org/.../on_borrowed_time.html
A woman who spent nearly 60 years of her life in an iron lung after being diagnosed with polio as a child died after a power failure shut down the machine. **Dianne Odell**, 61, had been confined to the machine since she was stricken by polio at 3 years old. She spent her life in the iron lung, cared for by her parents and other family members. Odell managed to get a high school diploma, take college courses and write a children's book. She made eye contact with visitors using an angled mirror above her head. A spinal deformity from the polio made it impossible for Odell to wear a more modern, portable breathing apparatus, so she continued to use the older machine.
The Evolution of Ventilators: Post Polio to Present Day

• As a result of the polio epidemics, controlled airway management & positive pressure mechanical ventilation became standards of practice.

• After each poliomyelitis epidemic there were large #’s of ventilators sitting idle, and the poliomyelitis ‘ICU’s’ were closed, which made it difficult to provide mechanical ventilation for other patients who could benefit from the technology.
The Evolution of Ventilators: Post Polio to Present Day

- By the late 1950’s it became evident that techniques applied during the polio outbreaks could be applied to the treatment of respiratory illnesses.
- This led to the reopening of ICU’s all over North America and Europe.
- The development of ICU’s grew partly out of increased public expectation for care.
- Opposition rose from some, but was embraced by most professionals, & public, who had a drive to preserve human life.
The Evolution of Ventilators: Post Polio to Present Day

• Late 1960’s = new understanding of pulmonary physiology, more effective monitoring, & better ventilators.
• Specialties emerged- pulmonology, respiratory nursing & therapists.
• Patients with lung diseases that could not have been treated previously were now able to receive lifesaving & elective surgeries.
• M.V. was seen as a “crutch”.
• It became used frequently & became apparent by about 1965 that mechanical ventilation was costly, specialized & may not be for everyone.
• Physicians started to think about developing criteria for when it was appropriate to use m.v., while medical ethicist & the legal system were beginning to take note of ethical problems.
• 1970’s- ICU’s flourished. Some patients benefited from the short term support of the ventilator, but other patients’ were sustained even if there was little hope of recovery.
Negative Pressure Ventilation - Making a comeback?

- Still used in Europe (especially Italy).

**Disadvantages with NPV**

- Weakened respiratory muscles
- Upper airway complications (secretions/obstruction)
- Lower esophageal dysfunction (aspiration of stomach contents)
- Cardiovascular effects (increased venous return).

**Advantages with NPV**

- No need for intubation
- Normal swallowing, feeding, speech, coughing.
- Less need for sedation

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*Poncho wrap ventilator* Poncho wrap ventilator is shown, displaying plastic “cage” that fits over the chest within the wrap. Negative pressure generator (Thompson maxivent) powers the ventilator.

http://cmbi bjmu.edu.cn/uptodate/pictures/pulm_pix/poncho1.gif
Public Expectation

- Public was fascinated with the hopeful power of science & technology in a grim disease, despite the fact that medicine was powerless at the mercy of polio.
- Families and patients were comforted by technology, yet at the same time they were fearful, due to a lack of understanding the technology.
- The iron lung was scary, but reassuring as it became a place of security.
- While the iron lung saved the lives of patients it also bred dependency, both physiologic and psychologic.
Public Expectation

• After World War 2 (1950’s), hospitals emerged as a strong symbol of growth reflecting American expertise and progress.
• The ability to ‘do something’ for previously catastrophic illnesses solidified the hospital’s position as the place to receive care & recover from illness.
• 1950’s -1960’s the case mix changed from minor to major surgeries, & more surgeries for chronic conditions.
• These severely ill patients were coming to be evaluated by the public as “savable”.

Health Care Providers Perceptions

- New technology frightening, but fascinating
- Nurses were conflicted
  - Did not want to shy away from technology,
  - Felt they would be betraying nursing by paying attention to machines.
- Nurses became responsible for caring for patient & machine.
- Some nurses were dissatisfied
  - Not able to provide comfort measures, or use their ‘hands of care’ & senses.
  - Patients were often seen as objects that were attached to machines.
- Nurses seemed to be overwhelmed with the technology at times,
  - Use, education, maintenance, complicated nursing procedures, nursing shortages & stressful situations.

news.bbc.co.uk/.../uk/newsid_1820000/1820203.stm
www.museumofhealthcare.ca/images2/NursingWorking.jpg
Decision Making

• Technological innovations, produce a chain of burden, as one choice leads to other & forces us to choose.

• For every choice made available by technology, another choice is made increasingly unavailable

• Society is involved in a struggle between modernity & tradition.

• Should we fight death with everything we have, or should we know when enough is enough & life must end?
The Evolution of Decision Making

- When the process of dying shifted from the home to the hospital, health care professionals assumed responsibility for the dying process & physicians became gatekeepers of this process.
- Drs. aimed to avoid failure- it was viewed as his duty to fight disease.
- Drs. generally chose to treat disease & set aside all other consequences.
- They commonly justified their actions with statements “I have no right to do otherwise”, or “I have to do it, it’s all I have to offer”.
- This provided the Dr. an opportunity not to face a death he could not prevent, & avoid communicating frightening news of incurability to the family & patients until the very end.
- Drs. faced death often, but did not offer guidance to patients when a fatal diagnosis was known.
- Nurses were not often involved in decision making, as their relationship with the patient was technical, administrative & task oriented, not person oriented.
The Evolution of Decision Making

- The shift in decision making now emphasizes open communication, achieving consensus & providing conflict resolution in dealing with withholding & withdrawing life sustaining treatment.

- Society now seems to demand that patients and family have more influence in the process; however this is fraught with problems & influencing factors.
Who Makes the Decision?

- Often in a life threatening situation all technology is applied on the direction of the physician.
- It can take weeks, months, or even years to wean off the ventilator.
- In some patients it may be evident that they cannot ever be weaned off the ventilator, so a decision must be made, either to withdraw mechanical ventilation or to continue prolonging ventilation to sustain life

- Patients as decision makers
- Family members as decision makers
- Physicians as decision makers
Preparing for the Future

• New social policies need to be established, with the participation of health care professionals & the public in a discussion of a humane way of life that will evolve in our society at a rate that can keep pace with inevitable developments of technology.

• Often it is the decision of physicians to decide who receives life support or not.

• They have become the arbiters of a public policy that has not been discussed with the public.

• Matters that involve mechanical ventilation should be examined & discussed by society at large.

• More IICU’s
Future of Death

- Kubler Ross’s model of dying- acceptance of death is the final stage of the dying process... why does it have to wait that long?
- We should think or meditate about our death to break down the rigid boundaries between life & death.
- Death education may decrease our fear of death.
- The future of death is in the hands of education & research, but scientists do not really research death, as much focus is on preserving life.
- Resolving the problem of death will also depend on a re-examination of medicine’s role in social life to reshape institutional practices & values and to reacknowledge a transition process from life to death.
Conclusion

• It is evident that the historical uses of mechanical ventilation, particularly during the poliomyelitis epidemics, have changed the public & professional perceptions of critical care and perceptions of death.

• In attempts to deny death we have used mechanical ventilation to sustain life, which has led to the need to examine the use of mechanical ventilation & associated decision making processes, which is clouded with various issues.

• Future health care may be in danger if issues of prolonged mechanical ventilation and decision making are not examined.