



HTA AS AN INSTRUMENT FOR AN APPROPRIATE SELECTION OF A MEDICAL DEVICE

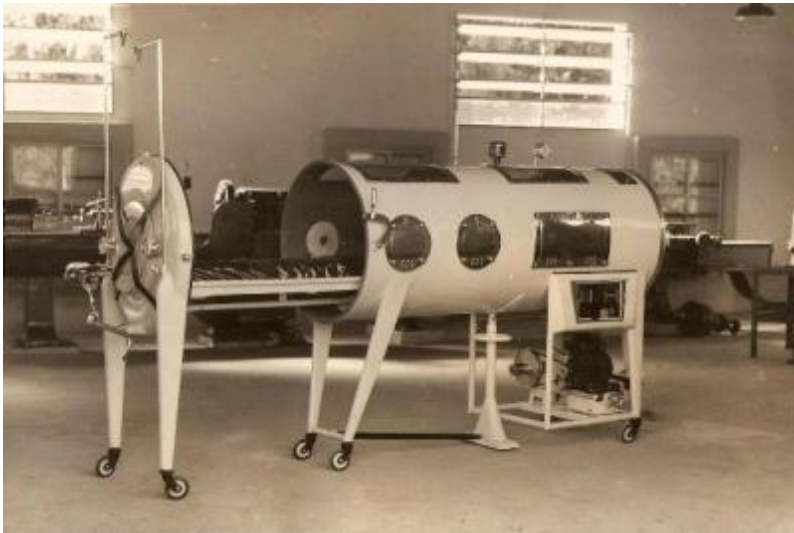
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Background



- It is a general problem how to select an appropriate medical device with suitable parameters, and how to justify its purchase.
- In hospital we want to select ventilator for newborns in ICU.
- What is the reason for assessment of new technologies?





Types of ventilations

- In this study – there are three types of ventilations:
 - Standard type – three possibilities of that
 - Hamilton Galileo
 - Avea
 - Vela
 - High-frequency ventilator using heliox
 - Biphasic curasic ventilator
 - RTX Hayek





- Why we apply value engineering?
 - In intensive care unit is not possible to use some questionnaire.
 - The value engineering evaluates the quality of medical devices, in terms of their functionality and usability in practice.
 - Methods of detection functions, which one we used:
 - FAST – „Functional Analysis System Technique“
 - The method of expert evaluation of the relevance function
 - Method deviation scale



Value engineering as part of HTA

- Method of cost function
 - Methods for determination of critical functions
 - Methods for assessing proposals and selecting optimal risk variants
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- The various methods of value engineering was first performed for each type of ventilator separately.
 - Then the data from these method of value engineering use in multicriterial analysis.

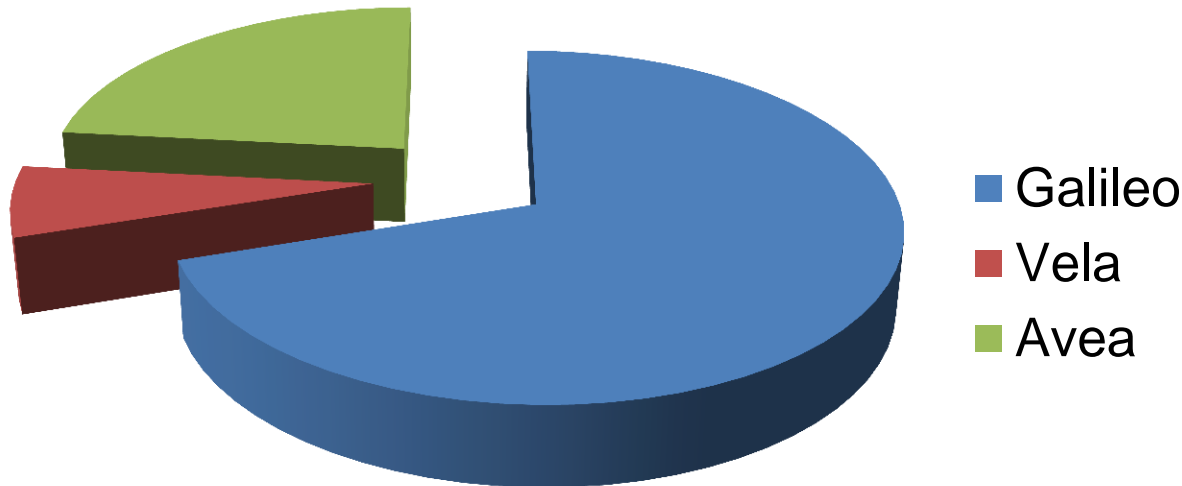


- Comparing the importance of functions and their evaluation is performed using professional opinion of doctors, nurses and biomedical engineers.
 - Doctors:
 - Analyze each function in terms of treatment process and in terms of benefit to patients.
 - Evaluates the function in terms of their expected frequency of use.
 - Nurses:
 - Assesses devices in terms of their control.
 - Biomedical engineer:
 - Assesses unit in terms of maintenance, technical management, and usability to connect with hospital software.

Collaboration with doctors and nurses



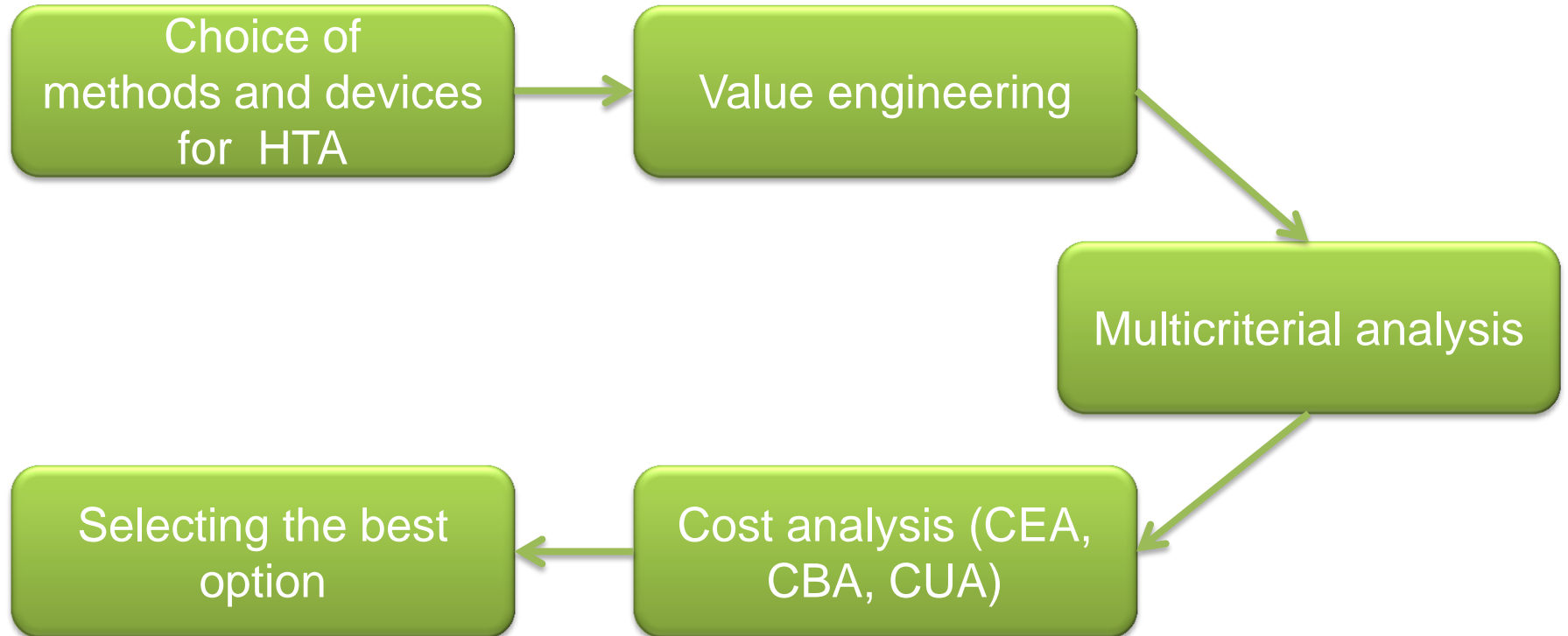
- Example of nurses assessment of ventilator Avea, Galileo and Vela:
 - „Which of these ventilators is easier to control?“



Multi-criteria analyse



- It deals with the evaluation of possible alternatives based on various criteria.
- The aim of this method is to summarize and organize information about options.
- The result of this analysis is either finding the best options, according to the criteria considered, the exclusion of inefficient variants, or a preferential sequence variants on the basis of the whole set of criteria.





Type Galileo:

Function	Points	Weight of function
A ₁	6	0,214285714
A ₂	2	0,071428571
A ₃	1	0,035714286
A ₄	3	0,107142857
A ₅	7	0,25
A ₆	5	0,178571429
A ₇	4	0,142857143

Final results of multicriterial analysis:

Standard type of ventilation	2,768736	3
Ventilation using heliox	2,987463	1
Biphasic curasic ventilation	2,897362	2

Normalized criterial table:

Type of ventilation	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇
Standard type of ventilation	0,3768	0,0589	1	0,9873	0,8621	0	0,3987
Ventilation using heliox	0,1287	0,3081	0,9	1	0,8724	1	0,2
Biphasic curasic ventilation	0,1579	0,1351	0,3333	0,8763	0,5517	1	0,05

Results – Cost effectiveness analysis



Type of ventilation	Evaluation functions	Costs (EUR)	CEA	Results:
Standard type of ventilation	2,768736	34600	8,00213E-05	1
Ventilation using heliox	2,987463	64800	4,61028E-05	3
Biphasic curasic ventilation	2,897362	52700	5,49784E-05	2



- From these study it would be the standard type of ventilation the best way.
- Why is the quality of ventilation with the use of heliox (open circuit) in the overall standings in last place.
- At present, research on semi-closed circuit using heliox ventilation, clinical results from the present study shows that using semi-closed circuit would cost decreased substantially. However, the results are not yet final.
- The biphasic curasic ventilator is really new in Czech republic. This is maybe the reason, why is so expensive. After the price will be lowest (<36000 Eur) it will be in this study the best way.

Conclusion



- The use of value engineering and multi-criteria analysis may be an appropriate method for assessing the quality of instrumentation in the acute care, but also others.
- However, it is necessary to do further studies and calculations.
- Value engineering in the HTA could be used in the evaluation of instrumentation for the purchase of new medical devices. This is a very comprehensive assessment.



Thank you!
Obrigada!

