

Definition of Treatment Modality by the Patients Using a Decision - Making Software

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Introduction:

The development of new techniques in Medicine opened the possibility of choice among a broader selection of therapeutic options. The minimally invasive techniques offer advantages and disadvantages when faced with the standard surgical procedures. This leads to debate over the medical literature. Therefore many options are available nowadays that even physicians experience the need for research before making a decision out of their own subspecialty. Patients many times feel insecure to make a decision among so many different options. Information is offered everywhere from the internet to the medical literature, passing through different specialists clinics.

The amount of information provided by multiple sources built up a new challenge that is to organize the information provided. Patients need to think about the options in a helpful and productive way to make a decision based on what is best to that particular patient considering his/her personal values and unique clinical condition. The VisionTree decision-making software was created aiming to help the patients on organizing their options to facilitate the final choice.

Results:

Scores ranging from 0 to 100% for each option were displayed in a table prioritized by the number of points as noted in Figure 2. Scores for each option were displayed in a form with the number of points (maximum = 900). Mean averaged score for first option treatment was 98.9 ± 8.6. For second and third options was 65.2 ± 19.0 and 39.7 ± 15.5, respectively. All but two (11.1%) patients decided for the treatment. All first option treatment until now scored above 70.

Table 1	Mean Rates (0-5)
Immediate Evaluation Criteria	4.2 ± 1.4
Software Usefulness	4.8 ± 0.4
Friendly Navigation	4.8 ± 0.4
Recommendation to others	4.6 ± 0.7
Satisfaction with the Tool	4.5 ± 0.9

Immediate survey rates are detailed in Table 1.

Treatment option rankings displayed by the software were what they expected in all but one case. This patient happened to be one of the two who were not able to choose any treatment option until the present moment. The other patient that did not define for any treatment demonstrated a clear trend for a In option however the family was not very supportive of his choice.

Step 2: Influencing Factors

Determining your clinical pathway carries at least one, or most likely several important factors. These factors should represent the most important ones for calculating your utility. Using your own words, type in all influencing factors and the reasons why they are important to you. Also, rate each factor's importance to your decision.

Influencing Factor	Why is this important?	Importance (1-10)
<input type="checkbox"/> Effectiveness	Live normal life	10
<input type="checkbox"/> Speech control	Be able to lecture	10
<input type="checkbox"/> Secure control	Drive car, feel safe	10
<input type="checkbox"/> Complications in general	Accidents	7
<input type="checkbox"/> Scarring	Rather not have scar	7
<input type="checkbox"/> Recovery Time	Want to resume activities	7
<input type="checkbox"/> Number of Visits	Fit with schedule	6
<input type="checkbox"/> Pilot	Want to continue flying	9

Click in the boxes to add, modify or delete factors and reasons.

Step 5: Special Concern

Options: Gamma Stereotactic Radiation Therapy

For each option, determine if there is a special concern (i.e. travel, cost, time off work, etc.)

No special concerns for this option

Yes in any special concern you have about choosing this option.

(Multiple visits)

How willing are you to choose this option based on this concern?

Not Willing ----- Very Willing

Figure 3

This figure shows how the patient can input any special concerns in the option that has been rated at that very moment and how the willingness grade to go through the evaluated option.

Figure 1

Summary of a case that may be approached by SRT if appropriate, craniotomy for gross total resection followed or not by radiation, stereotactic radiation solely, biopsy followed by resection.

41 year-old, male, music professor, hobby: airplane pilot, recent development of seizures

MRI T2 weighted image

Memory Area

Tumor Area

Hearing Area

Right

Left

Materials and Methods:

Eighteen patients from UCLA Neurosurgery Clinic were offered to use VisionTree Healthcare decision making software after a regular consultation with the doctor. They harbored a variety of diagnosis: central pain, skull base tumors, supratentorial tumors, spinal tumors and trigeminal neuralgia. An example of the cases invited to experience the software is noted in figure 1.

The mean age of this series was 55.2 years-old. There were 6 female and 12 male. Therapeutic options for each case were considered individualizing characteristics such as: lesion size, closeness to eloquent structures, comorbidities and pre-treatment neurological deficits.

Effectiveness, complications, recovery time, number of visits and specific relevant issues due to the baseline pathology were rated by a physician considering the current literature data taking into account the risks for each particular case.

Patients defined their priorities by grading each item from 1-10 (10 = best). Personal criteria values (like death / sequelae fear, recovery time, being able to attend son's graduation, being able to perform hobbies) may be included and rated by the patient according to its importance. (Figure 2) The software calculates a normalized score (between 0 and 100) reflective of the patients importance, likelihood and willingness ratings (on a scale of 0 – 10) for each option. (Figure 3) This score represents to what degree (as a percentage) the option met the rated criteria by a patient. A final score table is obtained after adjusting the physician and the patient's ratings per treatment option. (See Figure 4).

An evaluation survey was completed using a 1-5 scale (5 = best). We considered a VisionTree Treatment Ranking score value between 0 – 30 as an undesirable option for the decision (examples are doing nothing or oral medication that is ineffective), 30 – 60 as an option that has merit, however, one or more of the factors are not supportive of the criteria for the decision, and 60 – 100 is a viable option to be considered.

Discussion:

The need for a decision-making process is the final consequence of a treatment tree recently available for many diseases. The decision-making software used in clinical practice is an innovative concept aiming to help patients making decisions according to their expectations and priorities. The goal is not to use the software as one more tool to provide information but turn the software session into an opportunity to organize the concepts accumulated through the medical consultations and research. The decision-making program does not offer additional information although it allows connection with the internet. The idea is to exhaust the doubts and additional concerns with the physician during the consultation.

After an open dialogue with the doctor(s), patients need additional time to absorb and weight the information provided in conjunction to their personal values and expectations. It is precisely at this context that the software aims to help patients. The goal is to display the options relating them with objective purposes and to organize ideas according to predefined criteria. Certainly the decision making software in one tool, not a final answer to the problem proposed. Solely in one particular case, the patient was not inclined towards any therapeutic option recommended by the software based on the score he achieved.

While it is difficult for an objective method to take into account all aspects of a decision that are intrinsically subjective, patients expressed satisfaction using VisionTree which was particularly helpful to evaluate therapeutic options in a clear and organized sequence. The physician is able to present all available options and the patient is able to objectively review, evaluate and confirm these options. This data is stored electronically in the medical records as part of the patient's informed consent.

The following are the treatment rankings presented in order of priority with your most preferred option receiving the highest score. All individual and maximum scores are based on your input from the sliding scales.

Patient ID: 1400012
Medical Condition:
Pituitary Adenoma
Possible Options:

Option: Pituitary Adenoma Stereotactic Radiation Therapy
VisionTree Score: 85
Total Points: 729 (Maximum possible points: 860)

Factor	Relevant	Importance	Rating	Points
Recovery time	Close the back to normal	9	9	81
Effectiveness	Want to keep vision intact, avoid scarring and avoid another surgery	10	9	90
Risks	Worry about physical side	10	9	90
Number of visits	Traveling from Signal Hill	7	4	28
Optic nerve involvement	Want to protect - this is key	10	9	90
Sub Total:				349

Special Concern (Maximum: 0)	Score
One time visit	307
Total Score: 729	

Option: Pituitary Adenoma Radiosurgery
VisionTree Score: 83
Total Points: 714 (Maximum possible points: 860)

Factor	Relevant	Importance	Rating	Points
Recovery time	Close the back to normal	7	9	63
Effectiveness	Want to keep vision intact, avoid scarring and avoid another surgery	10	9	90
Risks	Worry about physical side	10	9	90
Number of visits	Traveling from Signal Hill	7	9	63
Optic nerve involvement	Want to protect - this is key	10	4	40
Sub Total:				347

Special Concern (Maximum: 0)	Score
One time visit	367
Total Score: 714	

Option: Pituitary Adenoma Surgery
VisionTree Score: 33
Total Points: 288 (Maximum possible points: 860)

Factor	Relevant	Importance	Rating	Points
Recovery time	Close the back to normal	9	5	45
Effectiveness	Want to keep vision intact, avoid scarring and avoid another surgery	10	9	90
Risks	Worry about physical side	10	9	90
Number of visits	Traveling from Signal Hill	7	7	49
Optic nerve involvement	Want to protect - this is key	10	4	40
Sub Total:				295

Special Concern (Maximum: 0)	Score
Surgery time	43
Total Score: 288	

Figure 4 Final Score obtained based on the physician's rating and the patient's grading according to his/her willingness towards each option.