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 person 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.
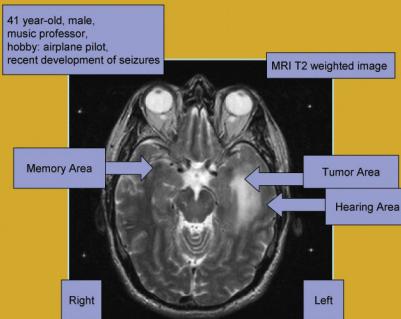

Figure 1

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

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 the 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.

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 (maximal = 900). Mean averaged score for first option treatment was 86.3 ± 8.6. For second and third options was 65.2 ± 19.2 and 39.7 ± 15.5, respectively. All but two (11.11%) patients decided for the treatment. All first option treatment until now scored above 70.

Table 1

Immediate Evaluation Criteria	Mean Rates (0-5)
Software Usefulness	4.2 ± 1.4
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 \n option however the family was not very supportive of his choice.
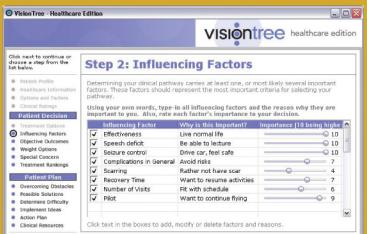

Figure 2

Software screenshot showing the rating of the influencing factors by the patient and based on the explanations many times expressed at the column named: Why is it important?
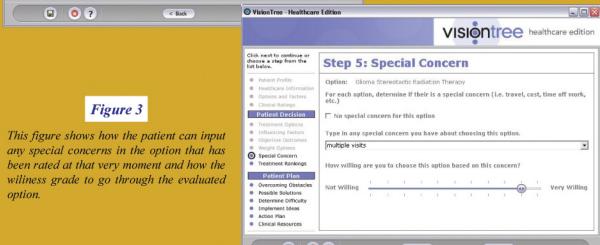

Figure 3

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.

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 use 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.

Figure 4

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