Tumor board: how to maintain quality of treatment decisions by focusing on complex cases while using digital decision support for standard cases. Experience of a university uro-oncology multidisciplinary cancer board with digital support in renal cell carcinoma.

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Background

Certified Cancer Centers are instructed to present 100% of all cases at multidisciplinary tumor boards (MTD). Since time is not unlimited, discussion of standard cases can be at the disadvantage of complicated cases. In any case, this leads to high quantity tumor boards, but what about high quality? [1-3]

A validated expert-curated decision support system (DSS) could enable to avoid discussion of standard cases in MTD and provide sufficient time for demanding cases.

Flow Chart & Patient characteristics

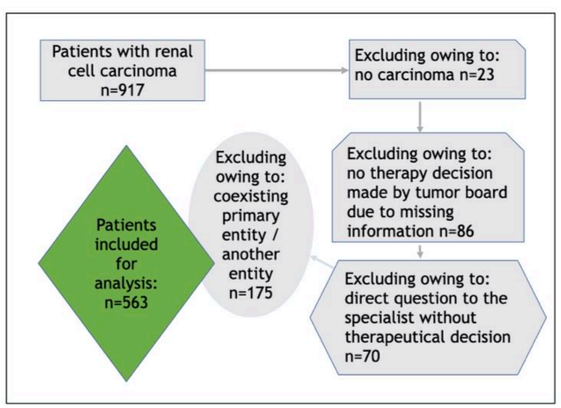

Figure 1 flow chart patient cohort with renal cell carcinoma

Cases analyzed		563
Age ± SD, years		64,99 ± 12,27
Gender, n (%)	Male	377 (67,0)
	Female	186 (33,0)
Histopathology, n (%)	Clear-cell RCC	344 (61,1)
	Papillary RCC	81 (14,4)
	Chromophobe RCC	23 (4,1)
	Sarcomatoid RCC	9 (1,6)
	Mixed histology	8 (1,4)
	Benign, Oncocytoma, Angiomyolipoma	30 (5,3)
	Carcinoma of the collecting ducts of Bellini	2 (0,4)
	N/A	66 (11,7)
Stage, n (%)	I	115 (20,4)
	II	10 (1,8)
	III	37 (6,6)
	IV	342 (60,7)
	N/A	59 (10,5)
Motzer score, n (%)	Low risk	29 (11,1)
	Intermediate risk	157 (60,2)
	Poor risk	64 (24,5)
	N/A	11 (4,2)
Treatment line, n (%)	No systemic treatment	286 (50,8)
	First-line treatment	147 (26,1)
	Second-line treatment	66 (11,7)
	Third-line treatment	37 (6,6)
	Fourth-line treatment	10 (1,8)
	Fifth-line treatment	17 (3,0)

Table 1 patient characteristics

Methods

1. Random samples of an equal number of patient cases per year from our MTD database with renal cell carcinoma, who were discussed in 2014-2018.
2. Each question discussed in the Tumor Board was answered, if possible, with the use of the smartphone application.
3. Independent reviewers then compared the recommendations of the MDT with those of the application, the source of the respective answers was not visible.
4. Analysis of concordance, descriptive statistics and data analysis: SPSS Version 25

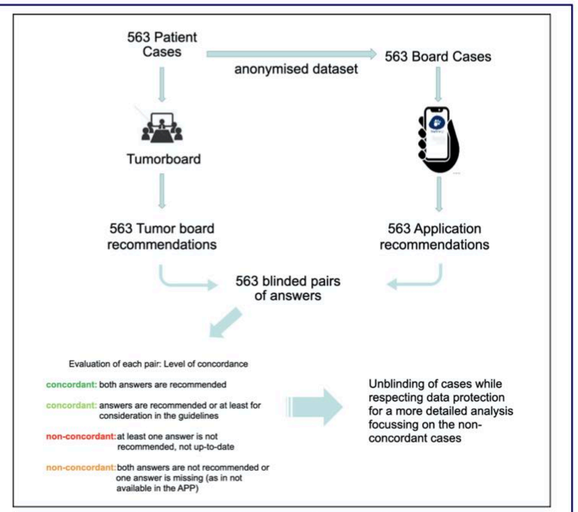

Figure 2 Evaluation of concordance

Results

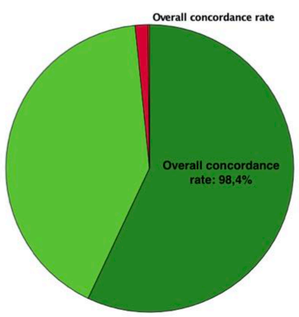

Figure 3 overall treatment concordance between the multidisciplinary tumor board and the application "EasyOncology"

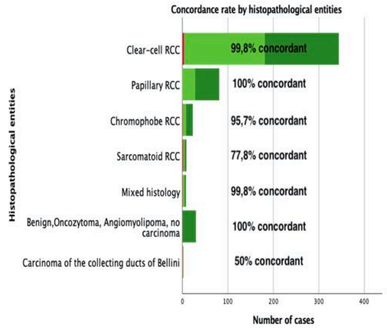

Figure 4 concordance rate by histopathological entities (renal cell carcinoma)

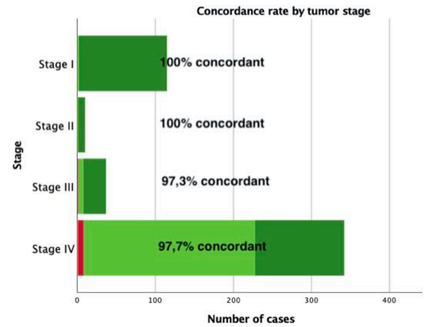

Figure 5 concordance rate by tumor stage (renal cell carcinoma)

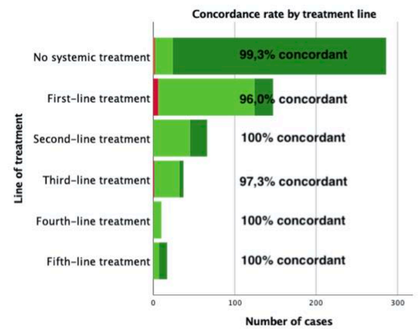

Figure 6 concordance rate by treatment line (renal cell carcinoma)

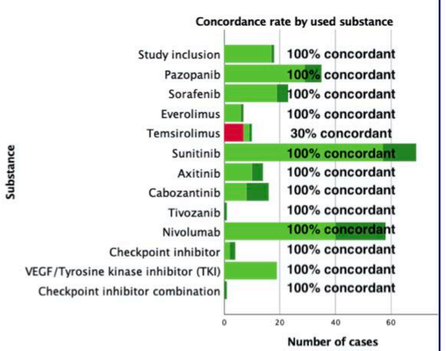

Figure 7 concordance rate by used substance (renal cell carcinoma)

Discussion

The reliability of any DSS is essential when considering the use in clinical practice. For standard first-line cases, our expert-curated DSS provided reliable decision concordance with a specialized MTD. Most divergent recommendations were identified in clinical stage III and IV and were caused by updated treatment guidelines. Taken as example for correct decisions in the past, MTD recommended temsirolimus as first-line treatment for 6 cases with advanced/metastatic stage and intermediate or poor risk. Using current guidelines, DSS recommended checkpoint inhibitor-based approaches.

Conclusion

Establishing a pre-selection of standard cases by DSS with human confirmation of digital treatment recommendations prior to conference could reduce the workload of MTD. This would allow specialists more time to discuss complex cases. Second, this provides a basis for standardized quality assessment with potential integration into cancer registries.

References

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2 Watson for Oncology and breast cancer treatment recommendations: agreement with an expert multidisciplinary tumor board. Somashekhar SP, et al. *Ann Oncol* 2018.
3 Concordance Study Between IBM Watson for Oncology and Clinical Practice for Patients with Cancer in China. Zhou N, et al. Oncologist. 2019

Conflict of Interest:

1. T. Elter: Managing director of Easy Medical Applications GmbH and developer of the application EasyOncology
2. Y. Yilmaz: Student worker for Easy Medical Applications GmbH