editorial

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Pediatric oncology 2.0—shaping the future with precision

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Achievements in pediatric oncology serve as a role model of what can be attained regarding cure and survival rates with multimodal conventional therapeutic strategies. Dose intensification and density oriented at the maximum tolerable, as well as strict adherence over the last 40 years to sequential series of treatment optimization trials available for most pediatric cancer entities in an internationally collaborative setting were the cornerstones of these achievements. Nevertheless, not every child with cancer nor every entity fares well with this strategy. Treatment burden in terms of amount delivered as well as duration have not changed the output for about 10–20% of children and adolescents overall. We need to think out of the box—most probably through integration of the concepts of personalized medicine: personalized not only by further improvement of risk stratification, as we have already for many years, but personalized based on individualized target definition. Oncologic precision medicine has also arrived in pediatric cancer care.

In this issue of the *Magazine of European Medical Oncology (MEMO)*, we provide a series of articles dealing with these aspects, both conceptually as well as in practice.

Drs. Azizi, Gojo and Peyrl present an overview of innovative treatment concepts for pediatric brain tumors [1]. They show that BRAF and MEK inhibitors have changed the management of NF-1 associated low-grade glioma. They summarize that also in other brain tumors determination of pathogenic gene fusions as well as molecular profiling already at an early timepoint offer novel therapeutic options through ALK, NTRK, MET, or ROS1 inhibition. Finally, the authors have applied multimodal antiangiogenic treatment in patients with recurrent medulloblastoma, a group of patients with dismal outcome even with the most aggressive conventional treatment, achieving long-term survival in several patients of their series.

As a paradigm of a currently incurable tumor entity occurring (also) in children and adolescents, Pezzullo and colleagues present three cases of primary diffuse leptomeningeal melanomatosis and give an overview of the literature [2]. While all their cases died early after diagnosis and not due to late presentation in grave clinical situation, they consider that BRAF/MEK inhibition as well as PD(L)1-immunotherapy may represent a way out of the therapeutic dilemma in this tumor entity. This is in line with a recent report by Gojo and coworkers who used such a therapeutic strategy in another patient with this rare disease [3].

In their comprehensive overview of the current status and needs in the context of precision medicine for pediatric malignancies, Drs. Salzer and Hutter, who run the clinical precision oncology program at the St. Anna Children's Hospital, explain that only through international collaboration we will be able to attain sufficient patients and complete precision medicine trials in a timely manner in order to really make advancements apart from occasionally curing individual patients by targeted therapy [4]. The problem of precision oncology, thus, becomes overt with a growing list of possible targets and their combinations held against the individualized situation among the anyway rare cancer entity in children. And it becomes crystal clear that only by rigorous standardization and validation of the technical aspects of molecular profiling and functional testing, from preanalytical aspects to data interpretation, will we be able to gen-

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eralize findings. The international pediatric oncology community has reacted on this already by creating supranational profiling and testing programs, e.g., recruiting hundreds to thousands of samples throughout Europe. Although it will still be a long rally, we believe that this is essential to move forward—and not through a plenitude of local programs with low numbers and lacking cross-validation.

Last, but not least, among this article series stands the communication of Dr. Fischmeister and colleagues about family-oriented rehabilitation of children and adolescents after cancer [5]. Notably, rehabilitation opportunity is really pediatric oncology care 2.0, having been granted and delivered since only 2018. Until that time, only adults had access to rehabilitation in Austria. In their paper, Fischmeister et al. now show first data of the types of improvements which can be achieved for pediatric cancer survivors via this new opportunity.

With this series of articles, we hope to provide an informative overview and flavor of the next steps and necessities in pediatric cancer care.

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