

Looking to the CAR-T future: vaccination, outpatient therapy, artificial intelligence and expanding indications

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On 28 November 2019, the first CAR-T therapy was carried out in Poland [1–3]. Today, several Polish centers are using this technology, and several others are preparing to do so. CAR-T therapy for children and young adults with acute lymphoblastic leukemia has been reimbursed by the National Health Fund since 1 September 2021, and for adults with non-Hodgkin lymphoma since 1 May 2022.

Today, c.150–200 patients are being treated with CAR-T cells every month in Europe, while more than 1,100 clinical trials are running worldwide. This hottest topic in hematology of the last few years has been traced also in *Acta Haematologica Polonica* [4–7].

In this issue, a set of five articles on CAR-T technology is presented: Dytfeld et al. [8] on outpatient therapy, Gil et al. [9] on artificial intelligence, Romejko-Jarosińska [10] on mantle cell lymphoma, Styczyński et al. [11] on vaccinations, and Żyłka et al. [12] on primary mediastinal lymphoma.

More indications will need reimbursement; expanding indications in ALL are needed, and multiple myeloma patients are being offered new hope. Although patients with T-cell ALL, AML and solid tumors can today only dream about such therapy, it is only a question of time before this becomes reality.

Authors' contributions

JS – sole author.

Conflict of interest

None.

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Ethics

The work described in this article has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans; EU Directive 2010/63/EU for animal experiments; Uniform requirements for manuscripts submitted to biomedical journals.

References

1. Styczyński J. Where dreams come true: CAR-T cell therapy in Poland! *Acta Haematol Pol.* 2020; 51(1): 1, doi: [10.2478/ahp-2020-0001](https://doi.org/10.2478/ahp-2020-0001).
2. Dytfeld D, Łojko-Dankowska A, Matuszak M, et al. Road to clinical implementation of CAR-T technology in Poznań. *Acta Haematol Pol.* 2020; 51(1): 24–28, doi: [10.2478/ahp-2020-0006](https://doi.org/10.2478/ahp-2020-0006).
3. Marschollek P, Liszka K, Gorczyńska E, et al. A dream that came true: Poland's first successful CAR-T cell therapy in child with refractory B-cell acute lymphoblastic leukemia (ALL). *Acta Haematol Pol.* 2021; 52(3): 211–213, doi: [10.5603/ahp.a2021.0028](https://doi.org/10.5603/ahp.a2021.0028).
4. Styczyński J. A brief history of CAR-T cells: from laboratory to the bedside. *Acta Haematol Pol.* 2020; 51(1): 2–5, doi: [10.2478/ahp-2020-0002](https://doi.org/10.2478/ahp-2020-0002).
5. Gil L, Łojko-Dankowska A, Matuszak M, et al. CAR-T cell therapy – toxicity and its management. *Acta Haematol Pol.* 2020; 51(1): 6–10, doi: [10.2478/ahp-2020-0003](https://doi.org/10.2478/ahp-2020-0003).
6. Styczyński J. Infections following CAR-T cells therapy: current state-of-the-art review and recommendations. *Acta Haematol Pol.* 2020; 51(1): 11–16, doi: [10.2478/ahp-2020-0004](https://doi.org/10.2478/ahp-2020-0004).

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7. Bembnista E. Implementation of CAR-T technology into clinical practice: challenge for cell bank. *Acta Haematol Pol.* 2021; 52: 263–267.
8. Dytfeld D, Gil L. Outpatient CAR-T therapy. *Acta Haematol Pol.* 2022; 53(3): 180–182, doi: [10.5603/AHP.a2022.0020](https://doi.org/10.5603/AHP.a2022.0020).
9. Gil L, Grajek M. Artificial intelligence and chimeric antigen receptor T-cell therapy. *Acta Haematol Pol.* 2022; 53(3): 176–179, doi: [10.5603/AHP.a2022.0019](https://doi.org/10.5603/AHP.a2022.0019).
10. Romejko-Jarosińska J. Radiotherapy in mantle cell lymphoma: a literature review. 2022; 53(3): 166–175, doi: [10.5603/AHP.a2022.0018](https://doi.org/10.5603/AHP.a2022.0018).
11. Styczyński J, Styczyński T, Sadlok J, et al. Vaccinations following CAR-T cell therapy: summary of reported cases and a state-of-the-art review of the current recommendations. *Acta Haematol Pol.* 2022; 53(3): 207–214, doi: [10.5603/AHP.a2022.0025](https://doi.org/10.5603/AHP.a2022.0025).
12. Żyłka K, Dytfeld D, Gil L. Primary refractory primary mediastinal lymphoma treated with CAR-T: new possibilities and challenges. *Acta Haematol Pol.* 2022; 53(3): 215–217, doi: [10.5603/AHP.a2022.0026](https://doi.org/10.5603/AHP.a2022.0026).