



Background

- Robotics are a novel technology that can be used in many different aspects
- Historically, robotics are mainly used in surgical procedures, however, they are now used in many clinical settings to support healthcare teams and enhance patient care
- The use of robotics and automation have allowed streamlined workflows and risk reduction that offers value in many areas of medicine.
- As technologies evolve, robotics will function more autonomously and will give healthcare teams more time to provide direct patient care

Methods

- A literature review was conducted with the terms “robotics” and “oncology”
- Articles in the date range of 2018-2022 were selected
- The publications were reviewed and categorized based on origin, purpose, type of source, target population, and themes

Results

Citation	Origin	Purpose	Type of source	Target Population	Themes
Pang B, Earl M, Knoer S, Yaniv A, Willner M, Boyd A. Comparison of IV oncology infusions compounded via robotics and gravimetrics-assisted workflow processes. <i>Am J Health Syst Pharm.</i> 2021;78(2):122-134. doi:10.1093/ajhp/zxaa366	US	Compare an IV gravimetric technology-assisted workflow platform (TAWF) to an IV robotic system	Experimental	Pharmacists	Productivity
Tătaru OS, Vartolomei MD, Rassweiler JJ, et al. Artificial Intelligence and Machine Learning in Prostate Cancer Patient Management-Current Trends and Future Perspectives. <i>Diagnostics (Basel).</i> 2021;11(2):354. Published 2021 Feb 20. doi:10.3390/diagnostics11020354	Europe	Overview of us of AI in diagnosis, genomics, and treatment	Review	Doctors, pharmacists	Productivity
Cherif Chefchaoui A, Boudina Y, Chennaq M, Belahcen MJ, Rahali Y. Contribution of an anticancer drug compounding robot in reducing the risks of manual preparation in a hospital pharmacy unit specialized in oncology [published online ahead of print, 2022 Aug 8]. <i>J Oncol Pharm Pract.</i> 2022;1078155222118846. doi:10.1177/1078155222118846	Africa	Evaluate the contribution of robot in reducing the risk of manual preparation	Experimental	Pharmacists	Safety
Trifanescu OG, Gales LN, Serbanescu GL, Zgura AF, Iliescu L, Mehedintu C, Anghel RM. Long-term oncological outcome in patients with cervical cancer after 3 trimodality treatment (radiotherapy, platinum-based chemotherapy, and robotic surgery). <i>Medicine (Baltimore).</i> 2021 Apr 2;100(13):e25271. doi:10.1097/MD.00000000000025271. PMID: 33787611; PMCID: PMC8021375.	Europe	Evaluate the long-term oncological result in patients diagnosed with cervical cancer treated with radiotherapy and robotic surgery compared with open surgery	Experimental	Doctors, pharmacists	Patient outcome
Meren ÜH, Waterson J. Evaluating An Automated Compounding Workflow Software for Safety and Efficiency: Implementation Study. <i>JMIR Hum Factors.</i> 2021;8(4):e29180. Published 2021 Nov 2. doi:10.2196/29180	Europe	Incremental change to a compounding workflow software solution has helped an organization meet goals of improved patient safety, increased number of oncology treatments, improved documentation, and improved communication between oncologists, pharmacists, and nurses	Experimental	Pharmacists	Safety, productivity
Sunny B. Bhakta, Pharm.D., BCPS, A. Carmine Colavecchia, Pharm.D., M.S., Ph.D., BCPS, William Coffey, B.S.Pharm., D.D.S., David R. Curlee, B.S.Pharm., Kevin W. Garey, Pharm.D., M.S., FASHP. Implementation and evaluation of a sterile compounding robot in a satellite oncology pharmacy. <i>American Journal of Health-System Pharmacy, Volume 75, Issue 11_Supplement_2, 1 June 2018, Pages S51-S57, https://doi.org/10.2146/ajhp170461</i>	US	Quantify the impact of robotic technology on efficiency, accuracy, and cost in a satellite oncology pharmacy	Experimental	Pharmacists	Productivity, cost
Capilli M, Enrico F, Federici M, Comandone T. Increasing pharmacy productivity and reducing medication turnaround times in an Italian comprehensive cancer center by implementing robotic chemotherapy drugs compounding. <i>J Oncol Pharm Pract.</i> 2022;28(2):353-361. doi:10.1177/1078155221992851	Europe	Determine impact of the centralization on the productivity of the pharmacy and evaluate the performances of the robotic chemotherapy drugs compounding	Experimental	Pharmacists	Productivity, cost
Alkhalilawi F. Conditionally Reprogrammed Cells and Robotic High-Throughput Screening for Precision Cancer Therapy. <i>Front Oncol.</i> 2021 Oct 19;11:761986. doi: 10.3389/fonc.2021.761986. PMID: 34737964; PMCID: PMC8560709.	Middle East	Summarize the potential use of conditional cell reprogramming (CR) and robotic high-throughput screening in precision cancer medicine	Review	Pharmacists	Productivity
Andras I, Mazzone E, van Leeuwen FWB, et al. Artificial intelligence and robotics: a combination that is changing the operating room. <i>World J Urol.</i> 2020;38(10):2359-2366. doi:10.1007/s00345-019-03037-6	Europe	Evidence on AI methods that have been applied during robotic surgery	Review	Doctors, pharmacists	Productivity
Catto JWF, Khetrpal P, Ricciardi F, et al. Effect of Robot-Assisted Radical Cystectomy With Intracorporeal Urinary Diversion vs Open Radical Cystectomy on 90-Day Morbidity and Mortality Among Patients With Bladder Cancer: A Randomized Clinical Trial. <i>JAMA.</i> 2022;327(21):2092-2103. doi:10.1001/jama.2022.7393	Europe	Compare recovery and morbidity after robotic-assisted radical cystectomy with intracorporeal reconstruction vs open radical cystectomy	RCT	Doctors, pharmacists	Patient outcome

Conclusion

- The main area that robotics is applied in oncology are in the preparation of oncology medications, AI, screening, and surgeries
- The use of robotics in the field of oncology provides a high level of patient care, efficient processes in clinical settings, and an environment that is safe of patients and healthcare workers

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