

BACKGROUND

According to Taddio et al. (2022), up to 18% of pediatric patients who are overdue for immunizations report needle phobia as a significant barrier to receiving vaccines. Recognizing how fears of pain and needles can delay essential preventive care, the Mayo Clinic pediatric subspecialty practice sought to create a process that would allow children to receive immunizations during planned procedural sedation, thereby reducing the number of painful encounters and improving the likelihood of completing recommended vaccine schedules. This approach was particularly important for specialties caring for children who are immunocompromised, medically complex, or who experience intense needle-related anxiety, including those with developmental or behavioral disorders. By integrating vaccination opportunities into sedated care, these teams aimed to minimize distress, reduce repeated needle exposures, and support families in getting children safely and comfortably caught up on overdue immunizations. This workflow not only decreases procedural pain and emotional trauma but also promotes timely vaccination—an essential step in protecting vulnerable pediatric populations from preventable diseases.

METHODS

An interprofessional team, including pediatric subspecialty nurses and providers, perianesthesia nursing, experts in immunization practices, pharmacy, and informatics, collaboratively designed a workflow to administer immunizations during planned pediatric procedural sedation. The project followed a structured quality-improvement approach focused on increasing vaccine access while reducing provider burden.

First, patient populations most likely to benefit from sedated immunization opportunities (e.g., hematology/oncology, aerodigestive, and general pediatrics) were identified through provider input. Eligibility criteria were established to ensure appropriate timing of vaccines, clinical stability, and alignment with recommended immunization schedules.

Next, the team partnered with informatics specialists to develop an EHR-integrated workflow that automated critical steps in the process. This included:

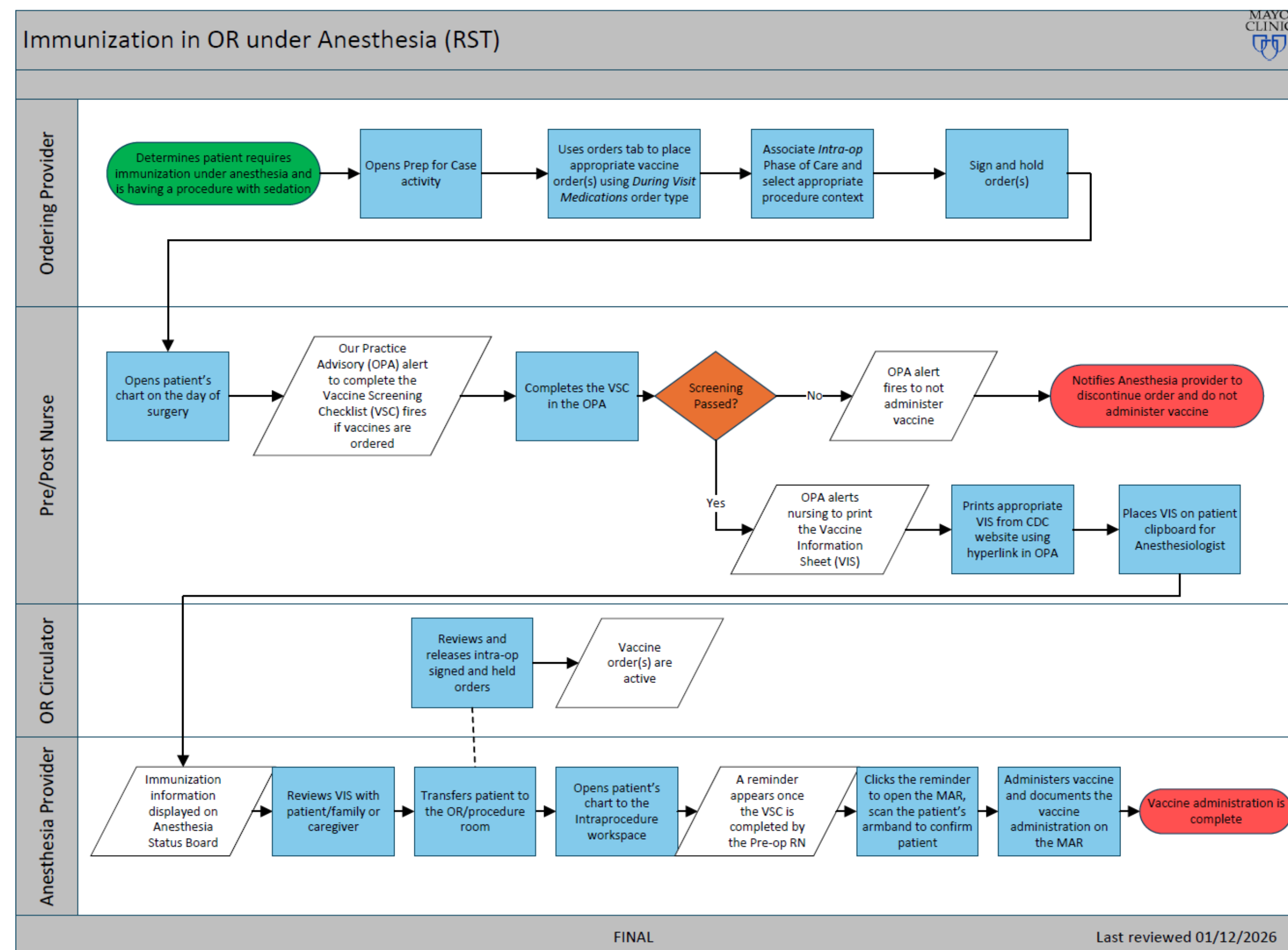
- A standardized pre-procedure immunization review within the EHR to identify overdue or upcoming vaccines.
- Embedded decision-support prompts to guide appropriate vaccine selection based on age, medical history, and catch-up schedules.
- EHR-based communication tools to notify the procedural and nursing teams of planned immunizations during sedation.
- Streamlined documentation tools to reduce manual charting and ensure accurate vaccine registry reporting.
- Nursing and procedural staff received training on workflow integration, including vaccine preparation, verification processes, and post-procedure documentation requirements. Vaccines were administered after the child was sedated for their procedure.

Data were collected on workflow utilization, number and type of vaccines administered, reduction in missed vaccine opportunities, and staff feedback regarding ease of use. The team monitored for process gaps, safety concerns, and opportunities to optimize EHR automation throughout iterative implementation cycles.

OBJECTIVES

- Increase access to immunizations for pediatric patients who are unable to receive vaccines in traditional settings due to needle phobias, behavioral challenges, or developmental factors.
- Improve vaccine completion and catch-up rates by administering immunizations during planned procedural sedation, particularly for medically complex children or those with developmental or behavioral disorders.
- Reduce painful and distressing experiences by minimizing the number of separate needle-based procedures children must undergo.
- Standardize a multispecialty workflow that supports safe, efficient, and reliable coordination of immunizations during sedated encounters.
- Leverage the electronic health record (EHR) to streamline communication, automate documentation, and reduce clerical burden for healthcare providers.
- Enhance patient safety and continuity of care through accurate vaccine verification, appropriate timing checks, and clean documentation within the EHR.

FIGURE 1: HIGH LEVEL WORKFLOW



RESULTS

FIGURE 2: VACCINES ADMINISTERED BETWEEN 10/01/2024 TO 12/31/2025

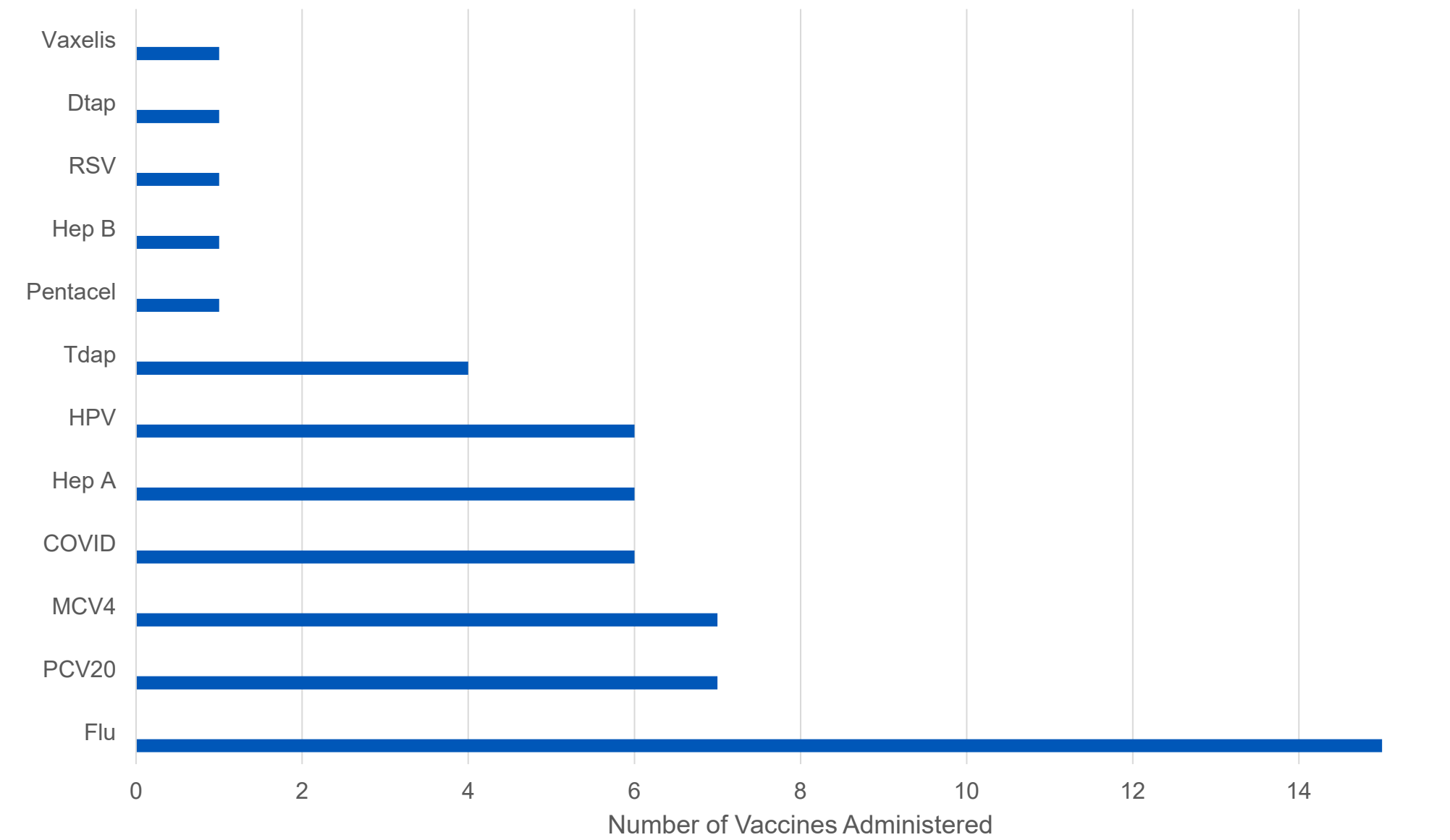


FIGURE 3: AGE OF PATIENTS

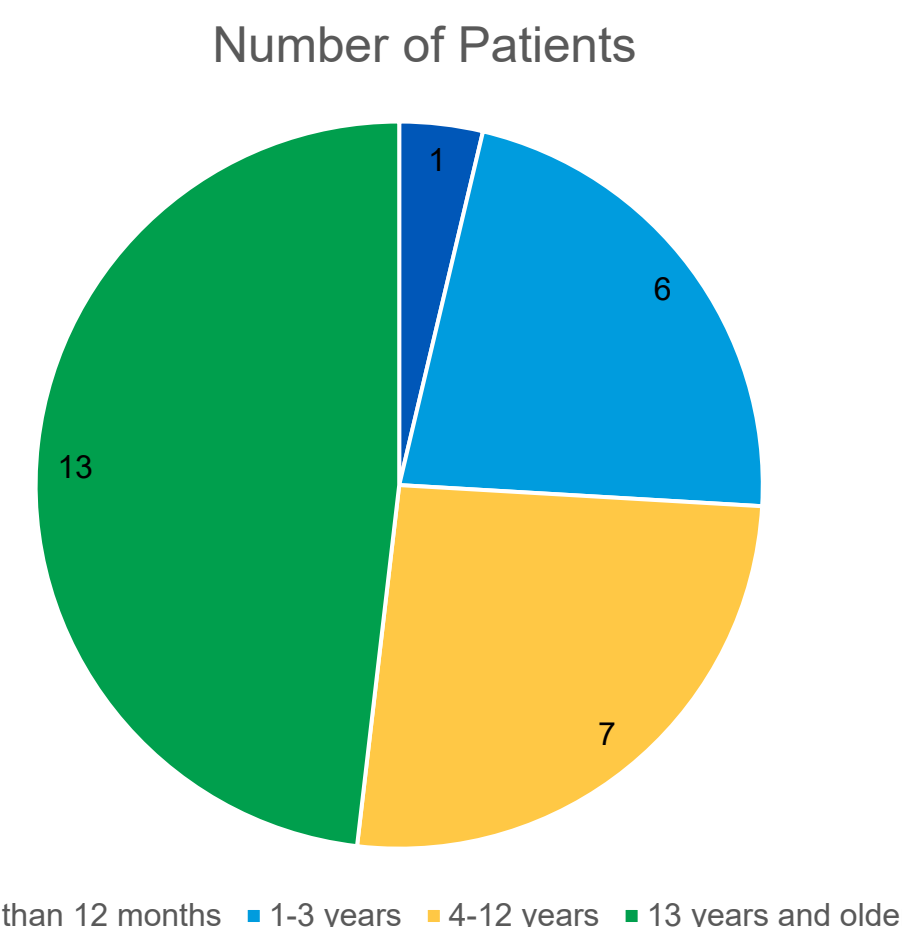
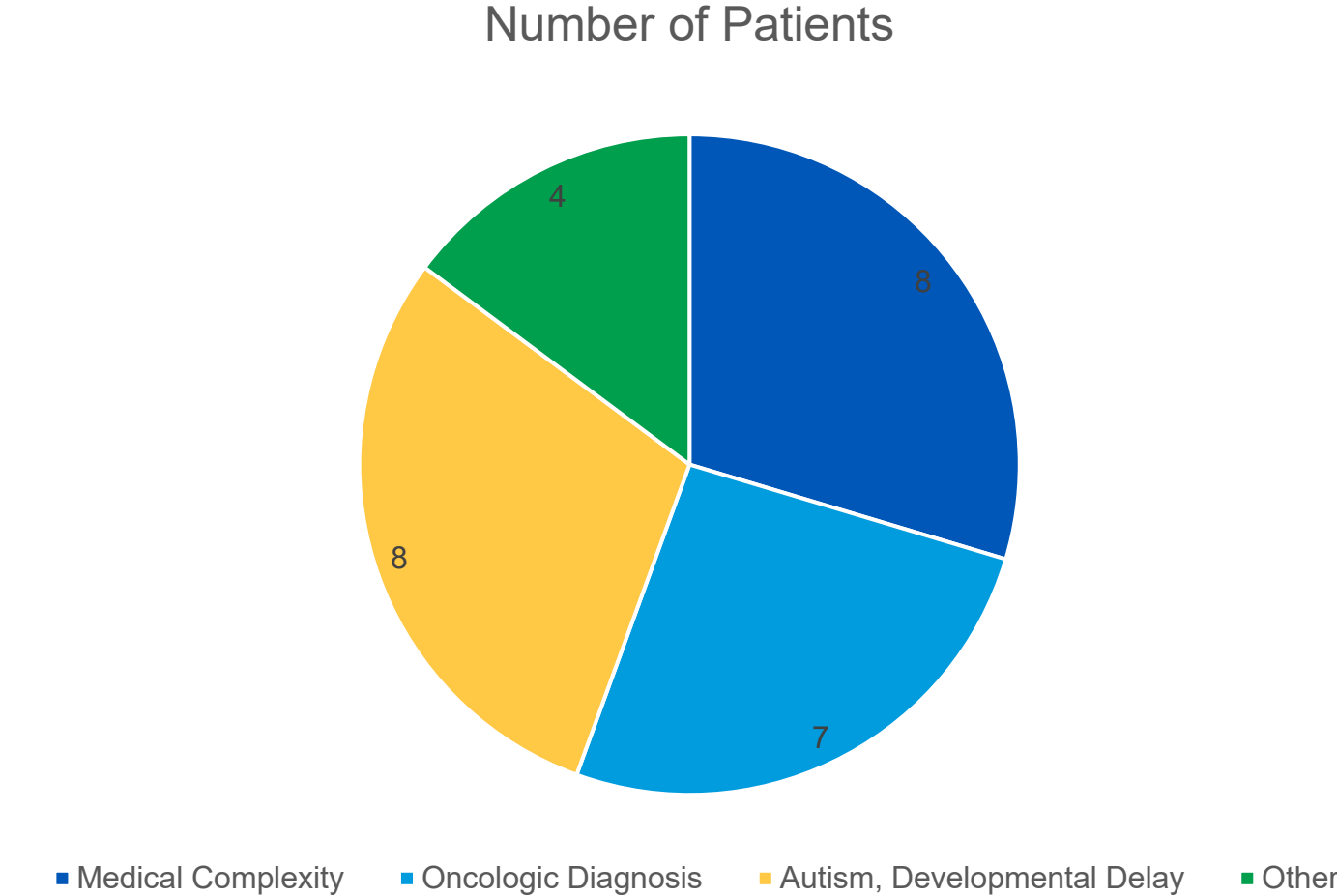


FIGURE 4: PATIENT POPULATION BY DIAGNOSES



From October 2024 to December 2025, a total of 27 pediatric patients received immunizations while under procedural sedation. Across these encounters, 61 vaccines were administered, as several patients received multiple overdue or age-appropriate immunizations during the same sedated procedure.

- **Increased vaccine access through sedation-based administration:** The workflow enabled timely administration of both routine and overdue vaccines, particularly benefiting medically complex, developmentally delayed, and immunocompromised patients—groups previously at high risk for falling behind on recommended schedules.
- **Reduced need for additional painful procedures:** Consolidating immunizations into sedated encounters minimized the number of separate needle-based visits, decreasing distress for patients and improving the overall experience for families.
- **Successful Multispecialty Adoption of Workflow:** Leveraging the integrated EHR streamlined vaccine identification, ordering, and documentation, reducing clerical burden and improving accuracy across teams.
- **No Safety Concerns Identified:** Throughout the implementation period, no immunization-related complications, workflow failures, or documentation errors were reported, supporting the safety and reliability of the sedation-based immunization process.

DISCUSSION

This quality improvement initiative demonstrates that administering immunizations during planned pediatric sedation is safe, feasible, and effective in increasing vaccine access for children who face barriers to traditional immunization settings. From October 2024 through December 2025, 27 pediatric patients received 61 vaccines during sedated procedures, frequently addressing multiple overdue or age-appropriate immunizations in a single encounter. Leveraging existing procedural visits reduced missed vaccination opportunities while minimizing patient distress.

The workflow primarily served children with medical complexity, oncologic diagnoses, developmental delay or autism, and other chronic conditions—populations at higher risk for delayed immunization due to needle phobia, sensory sensitivities, and frequent healthcare encounters. Consolidating immunizations into sedated procedures reduced the need for additional needle-based visits, decreased distress for patients and families, and promoted equitable access to preventive care.

Successful implementation relied on strong interdisciplinary collaboration and EHR integration to support standardized vaccine identification, ordering, communication, and documentation while reducing clerical burden. Early workflow challenges were promptly identified and addressed through iterative refinement, resulting in a reproducible and efficient process that can be sustained across teams.

Perianesthesia nurses played a central role in workflow execution including assessment, coordination, education, and safe vaccine administration during sedation without disruption to procedural care. No immunization-related safety events, workflow failures, or documentation errors occurred, supporting the reliability of this nurse-driven model.

Beyond the pediatric subspecialty practice, this workflow shows promise for scalability to other procedural settings and populations including adults with developmental disabilities or severe needle phobia, aligning patient comfort, safety, and public health priorities.

CONCLUSIONS

This initiative highlights the leadership and expanding scope of perianesthesia nursing, demonstrating how nurses can drive innovative, ASPAN-aligned workflows that integrate preventive care into perioperative practice. Through interdisciplinary collaboration and EHR-supported processes, immunization delivery was standardized, efficient, and sustainable without compromising patient safety.

Sedation-based immunization offers a scalable model for improving vaccine completion and catch-up rates among vulnerable populations. As healthcare systems continue to address gaps in preventive care, perianesthesia-led innovations such as this one underscore the specialty's vital role in advancing compassionate, high-quality, and equitable care.

REFERENCES

1. Taddio, A., McMurtry, C. M., Logeman, C., Gudzak, V., de Boer, A., Constantin, K., Lee, S., Moline, R., Uleryk, E., Chera, T., MacDonald, N. E., & Pham, B. (2022). Prevalence of pain and fear as barriers to vaccination in children: Systematic review and meta-analysis. *Vaccine*, 40(52), 7526–7537. <https://doi.org/10.1016/j.vaccine.2022.10.026>