سدرة للطب
Sidra Medicine

Pediatric Oncology Report 2023

DATA FROM 2019 - 2023

Sidra Medicine

Pediatric Oncology Report 2023

Contents

From left to right:
Dr. Erdener Ozer, Division Chief Anatomical Pathology Division | **Dr. Wouter Hendrickx**, Lead Principal Investigator, Pediatric Precision Oncology Initiative | **Dr. Ayman Saleh**, Division Chief Oncology and Hematology Division | **Dr. Ian Pople**, Division Chief Neurosurgery Division

Welcome Message

We are pleased to present Sidra Medicine's "Pediatric Cancer and Precision Oncology in Qatar" 2023 Annual Report.

The report is a joint update from the Pediatric Precision Oncology Initiative, the Oncology and Hematology Division, the Anatomical Pathology Division, and the Neurosurgery Division at Sidra Medicine.

Since opening our main hospital in 2018, Sidra Medicine has become the country's sole healthcare provider for the care and treatment of children and young people with cancer. To support our personalized medicine strategy, we initiated the Sidra Medicine Pediatric Precision Oncology Initiative in 2019, which works closely with our pediatric cancer services. This initiative has been funded by Sidra Medicine Research Branch IRF and QRDI PPM5.

This close synergy between our clinical and research divisions grants us a comprehensive understanding of our patients' characteristics and epidemiology but more importantly to develop personalized precision medicine treatment protocols.

The collaboration has also led to the creation of two significant assets: the Qatar Pediatric Cancer Registry and The Sidra Pediatric Cancer Biorepository (SPCB). The former collects comprehensive clinical data, while the latter seeks consent from patients to donate materials no longer needed for diagnosis, thus enabling pertinent research for our local population. These repositories, built on the expertise we have acquired over the years, are now our springboard to precision oncology.

Presenting data from 2019 to 2023, we aim to share the rich data repository that guides our clinicians in identifying rare targetable somatic mutations and facilitating patient enrollment in worldwide clinical trials. These data allow us to spotlight novel molecular targets in specific patient subgroups, paving the way for new biomarkers and therapeutic strategies.

Worldwide, the incidence rates of childhood cancer range between 50 and 200 per million children. In Qatar, we find ourselves in the center of this spectrum with a rate of 126 per million children. Our patient population at Sidra Medicine primarily consists of individuals of Arab and Asian descent, making up 60.26 percent and 31.79 percent of our patients, respectively. The most prevalent diagnoses are Leukemia (31%) and Central Nervous System malignancies (23%), followed by Germ cell tumors, renal tumors, Neuroblastoma, and Sarcomas.

As we improve the timing and rate of consent acquisition, we edge closer to providing molecular profiling at the point of diagnosis. This wealth of data, which surpasses current clinical requirements, is the result of our strategy to align people and technologies, ensuring harmony between pathology, research, and clinical care; an equally challenging and rewarding endeavor.

We firmly believe that these initiatives will empower pediatric patients to benefit from the seismic shift in cancer treatment, a revolution led by targeted and immunotherapy trials. This deeper understanding of tumors, exploring genetic determinants, epigenetic classification, immune phenotypes, mutational load, or intratumoral heterogeneity, gives us insights into adapting groundbreaking therapies for our pediatric patients.

Our work is at the forefront of personalizing precision medicine for every pediatric cancer patient in Qatar. It is our hope that this shared knowledge will enhance understanding and contribute to improved cancer care outcomes.

Dr. Wouter Hendrickx,
Lead Principal Investigator,
Pediatric Precision Oncology Initiative

Meet the Team

Pediatric Precision Oncology Initiative Lead

Dr. Wouter Hendrickx



Oncology Team

Dr. Chiara Cugno

Dr. Ayman Saleh

Dr. Ata Maaz



CRC Team

Blessing Dason

Aisha Khalifa

Asma Jamil


Wet Lab Team

Dr. Christophe Raynaud

Apryl Sanchez



PRIME Team

Shafqat Baig

Mohammedhusen Khatib

Mehshad Hamza

Pathology Team

- Dr. Sergey Popov
- Dr. Erdener Ozer
- Dr. Gordon Vujanic
- Dr. Fouad Alchami

Dry Lab Team

- Dr. Shimaa Sherif
- Rania Alanany

Surgical Team

- Dr. Khalid Al-Kharazi
- Dr. Ian Pople

Nursing Team

- Mohammed Anas
- Rachel Park
- Arianne Alejo

CORE Team

- Dr. Sara Tomei
- Dr. Abbirami Sathappan
- Dr. Oleksandr Soloviov

Bioinformatics Team

- Dr. Abdul Rahman Salhab
- Fazulur Rehaman Vempalli

INTERVIEWS

Pioneers in Pediatric Pathology and Neurosurgery

Dr. Erdener Ozer is the Division Chief of Anatomical Pathology and joined our hospital in 2021. He is also a senior attending physician who manages the integrated digital pathology reporting for a full range of pediatric surgical pathology and placental work, as well as autopsies. In addition to his clinical role, he conducts research as a leading PI and co-PI. His special research interest is in the genomic pathology of pediatric tumors, including neuroblastoma and pediatric brain tumors. He is also part of the biobanking facility for the Sidra Pediatric Precision Oncology Initiative.

“I am particularly interested in pediatric cancer research focused on genetic and molecular profiling, biomarker discovery, tumor microenvironment, novel treatments like immunotherapy, and precision medicine. These areas offer insights into the underlying mechanisms of cancer, enable early and accurate diagnosis, inform the development of targeted therapies, and help tailor treatments to individual patients. This approach improves treatment outcomes and reduces adverse effects, ultimately enhancing the quality of life for pediatric cancer patients.”

Some of the diagnostic challenges we have encountered in pediatric pathology have been due to the rarity and diversity of pediatric cancers, non-specific early symptoms, difficulty in obtaining adequate biopsy samples, rapid disease progression, genetic and molecular heterogeneity, and the lack of standardized treatment protocols for some tumors.

Additionally, we must stay current with evolving diagnostic criteria, coordinate effectively with various specialists, and often deal with figuring out the clinical indications to perform advanced diagnostic tools. Continuous education, interdisciplinary collaboration, and the knowledge of how to use advanced technologies are essential to overcoming these challenges and ensuring accurate and timely diagnoses.”

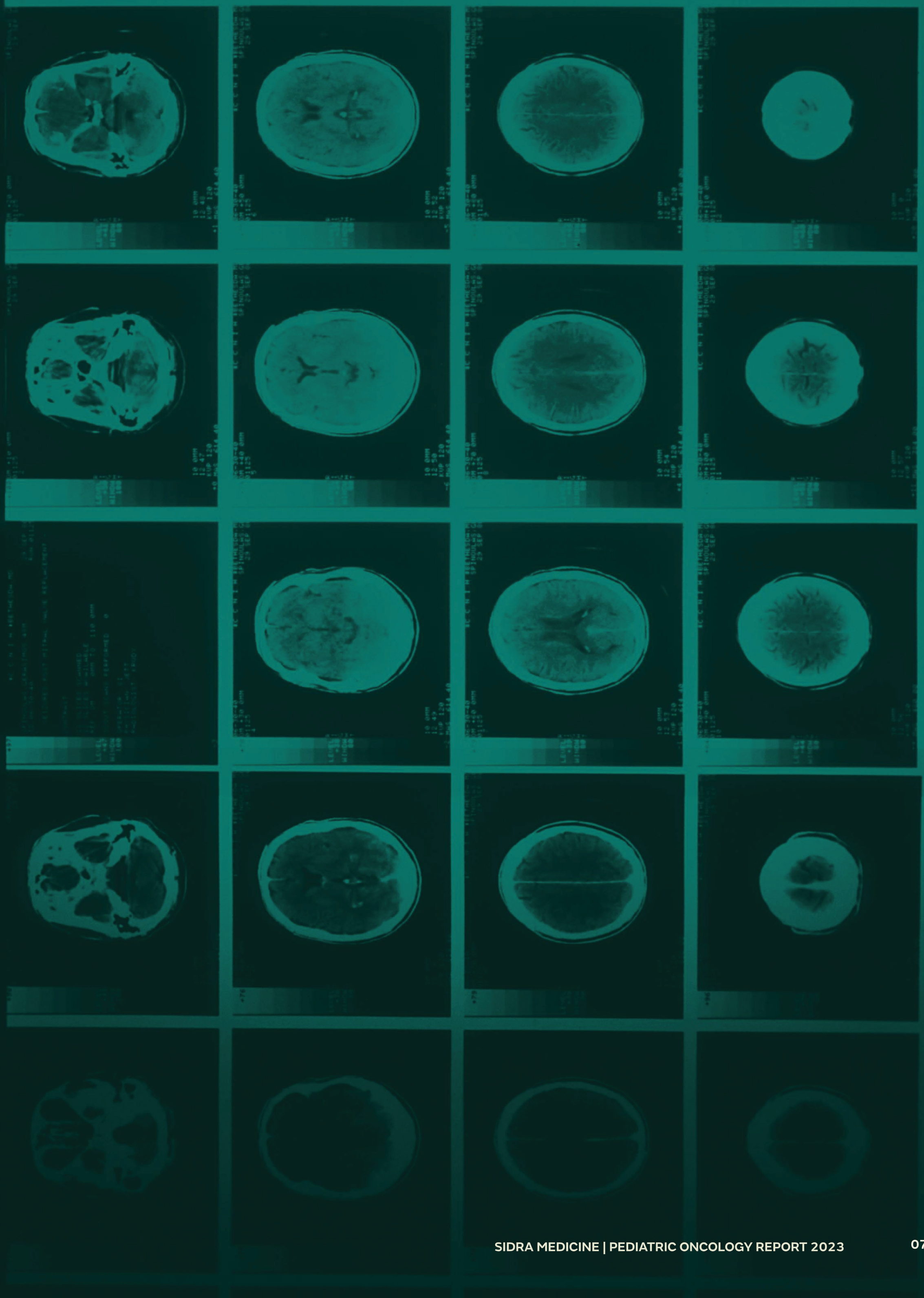
Dr. Erdener Ozer and Dr. Khalid Al Kharazi

Dr. Khalid Al Kharazi is a senior attending/ consultant neurosurgeon and director of the pediatric neurosurgery fellowship program. His division manages neurosurgical conditions for most children in Qatar, from the first day of life to the age of 18 years. They provide comprehensive care starting from the diagnosis of the condition, preoperative planning, and surgical approaches, utilizing the best neurosurgical instruments and equipment, in addition to the team’s extensive experience.

“Our neurosurgery capabilities play an important role in pediatric cancer treatment. Our team provides top-notch care starting from diagnosis through to surgical intervention. We utilize advanced imaging technologies such as the latest CT and MRI machines, and our expert neuroradiologists play a crucial role in diagnosing conditions accurately.

The cancer tissue is meticulously analyzed by our experienced neuropathologists, and if needed, we seek further support from Sidra Medicine partners overseas for molecular genetics and other advanced diagnostic tools. Our collaboration with research teams ensures that we offer cutting-edge treatment options, improving patient outcomes significantly.

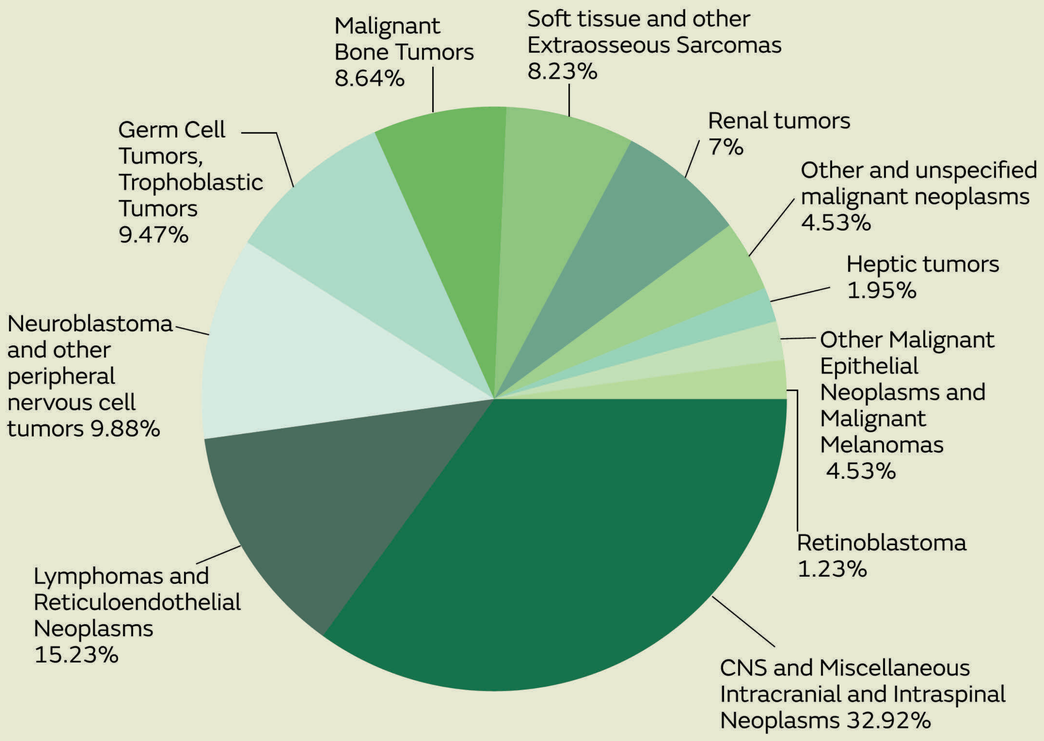
Seeing children with malignant tumors surviving and returning to the clinic for follow-up with happy parents is incredibly motivating. Medicine is a science that never stops progressing, and I stay current with the latest research and developments by attending and organizing scientific meetings, collaborating with experts in the field, and exploring new research studies. The opportunity to make a significant difference in children's lives and contribute to advancements in pediatric oncology keeps me dedicated to this field.”



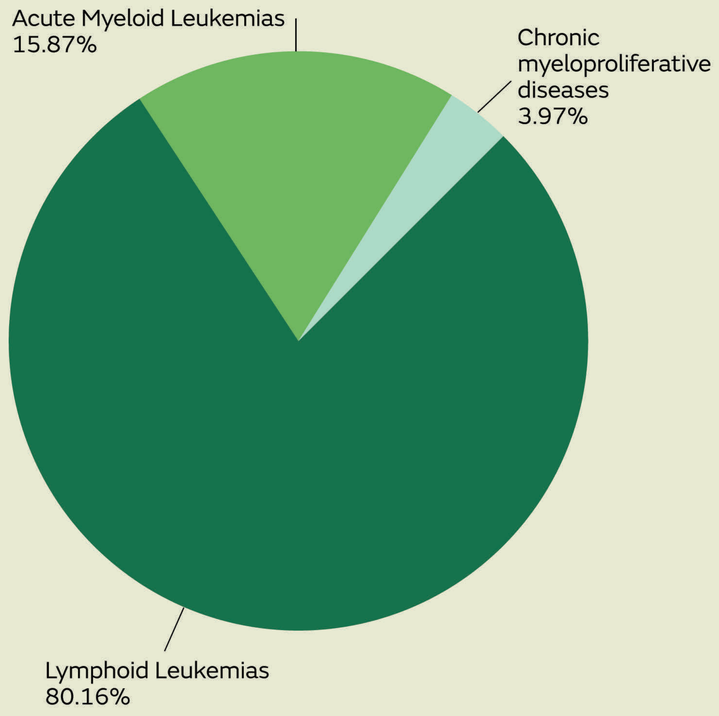
SIDRA MEDICINE PEDIATRIC CANCER REGISTRY

Overview

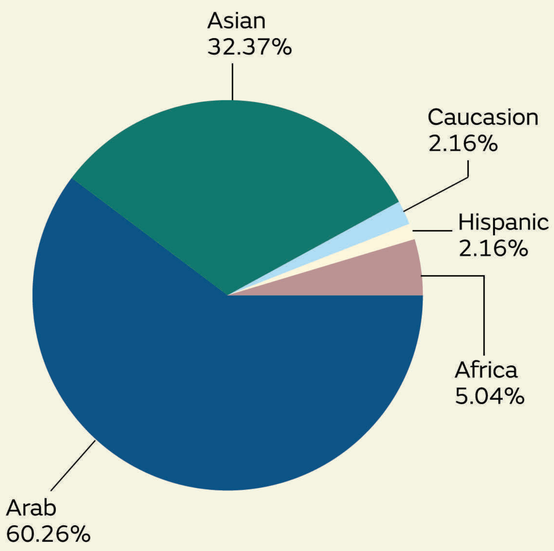
Types of Pediatric Solid Cancer Presented at Sidra Medicine (69%)



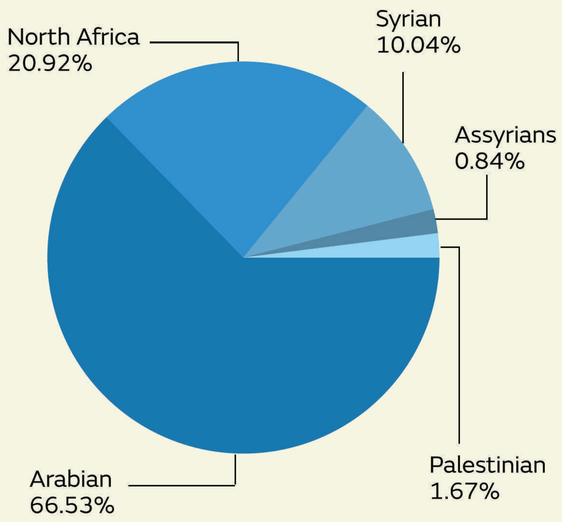
Types of Pediatric Non-solid Cancer Presented at Sidra Medicine (31%)



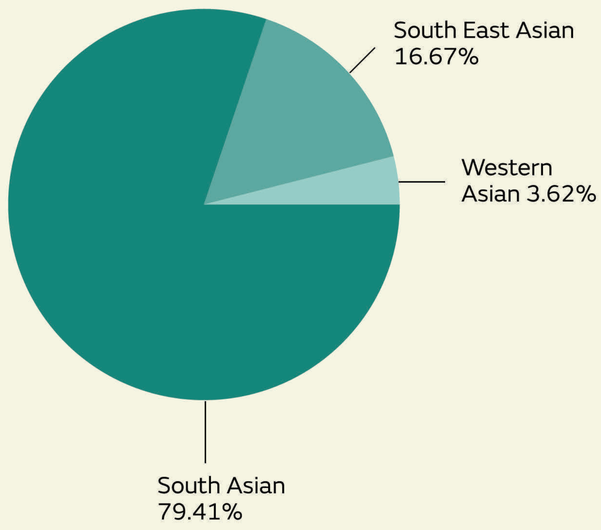
Ethnicity of Our Patients



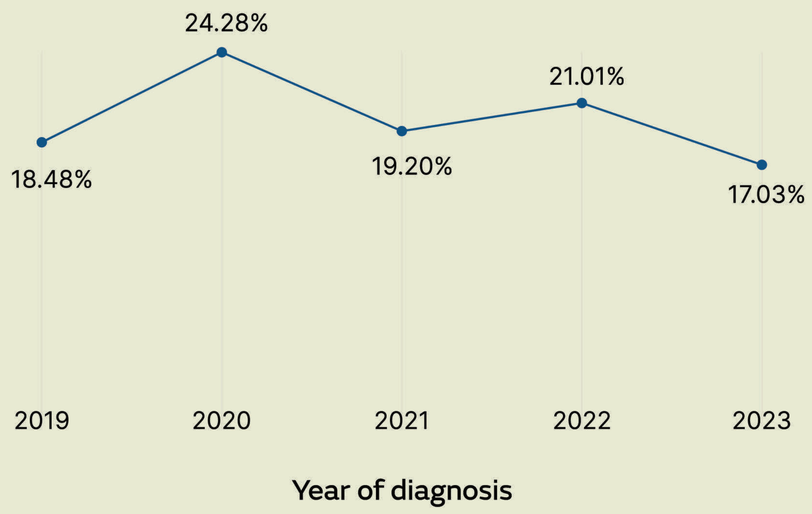
Arab Population



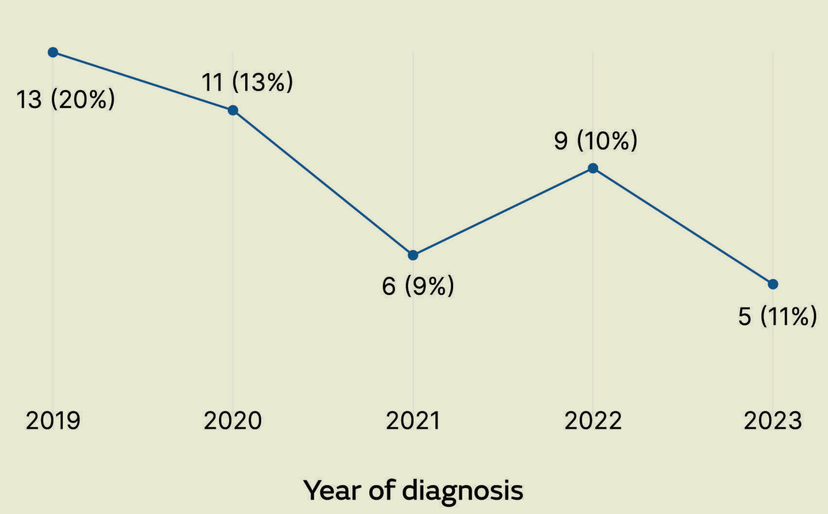
Asian Population



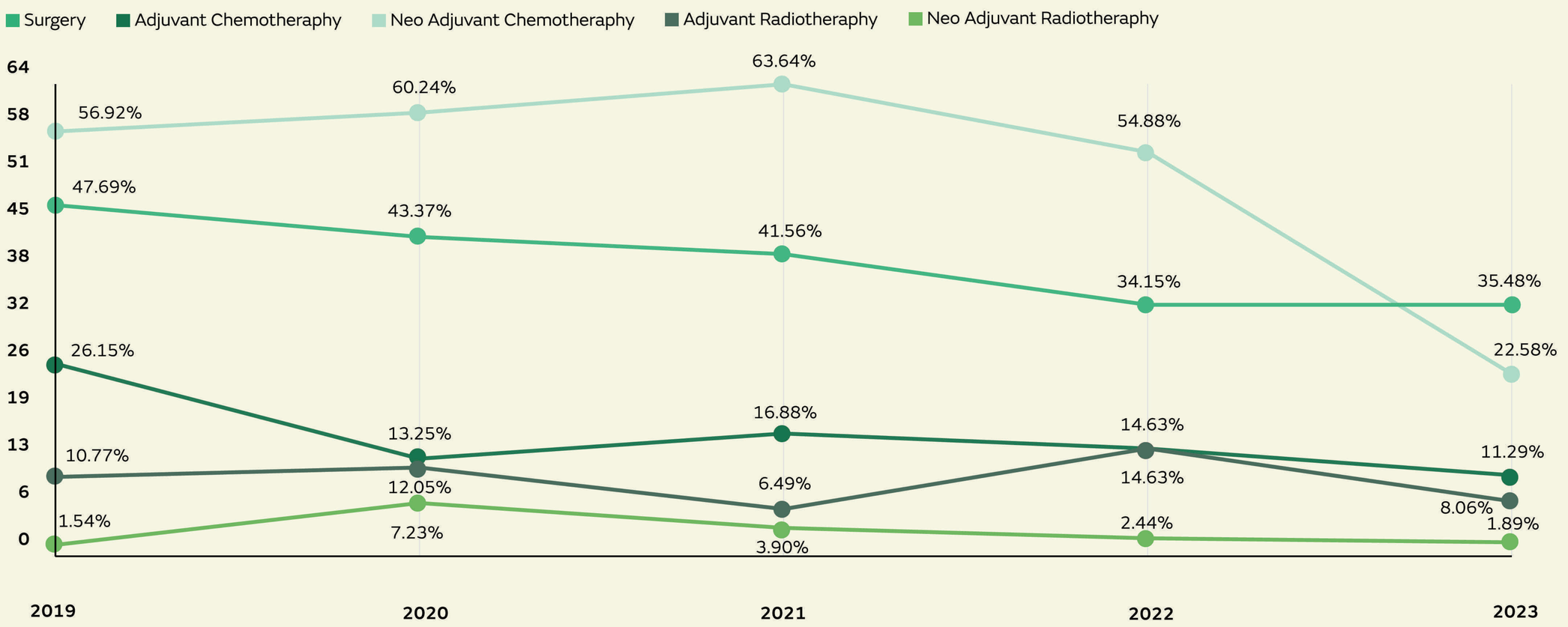
Patients with Metastasis at Diagnosis



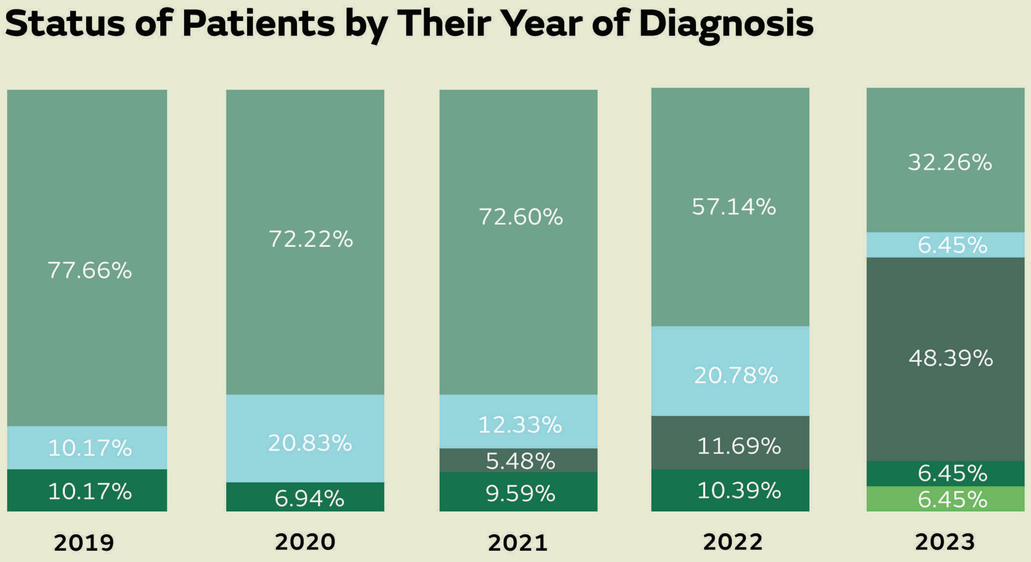
Treated Abroad by Year



Evolution of the Modalities of Treatments Applied at Sidra Medicine



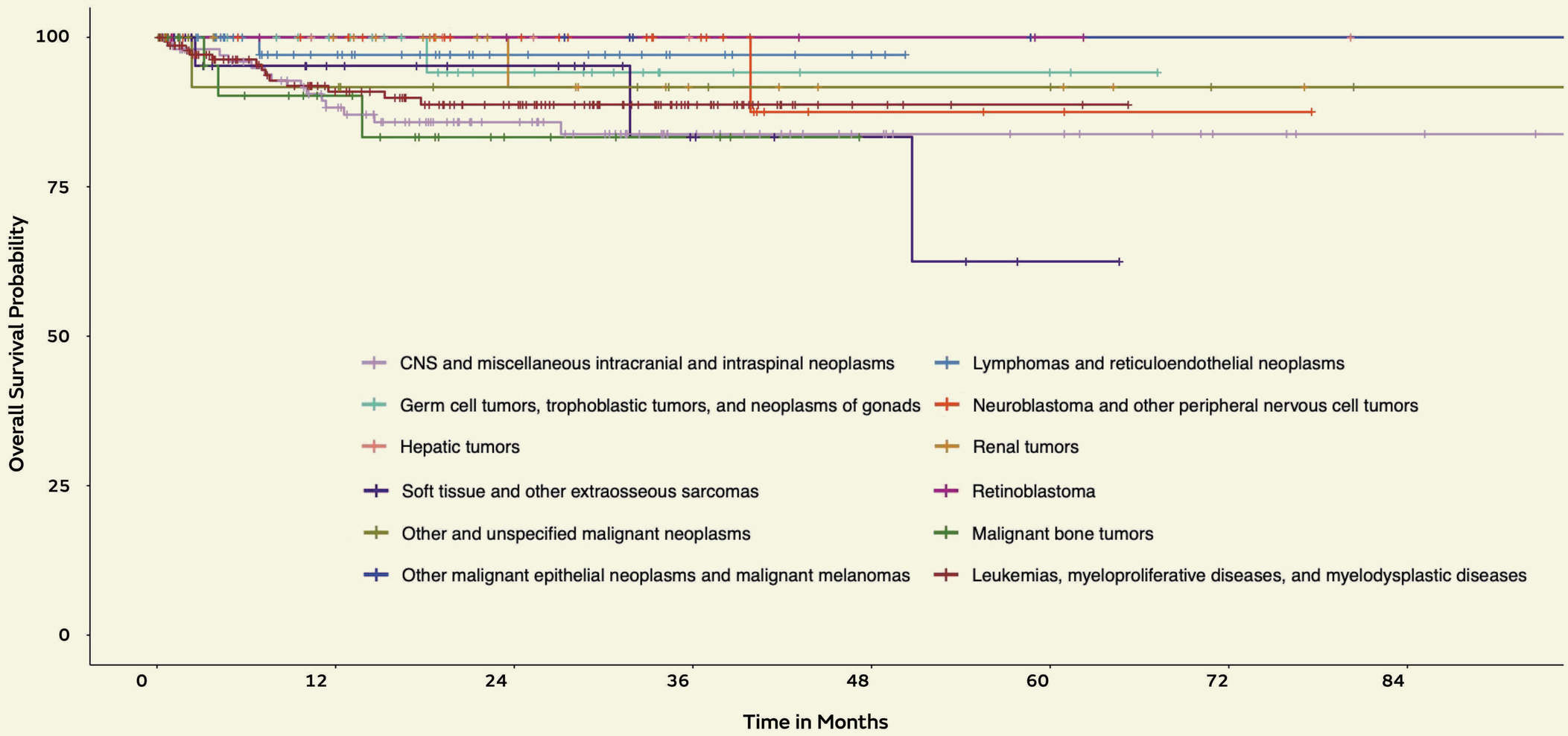
Status of Patients by Their Year of Diagnosis



Current Status

- Alive and Disease Free
- Alive with Local Disease
- Undergoing Primary Treatment
- Deceased
- NA

Traditional Kaplan Meir Survival Plot of Our Patient's Population by Cancer Type

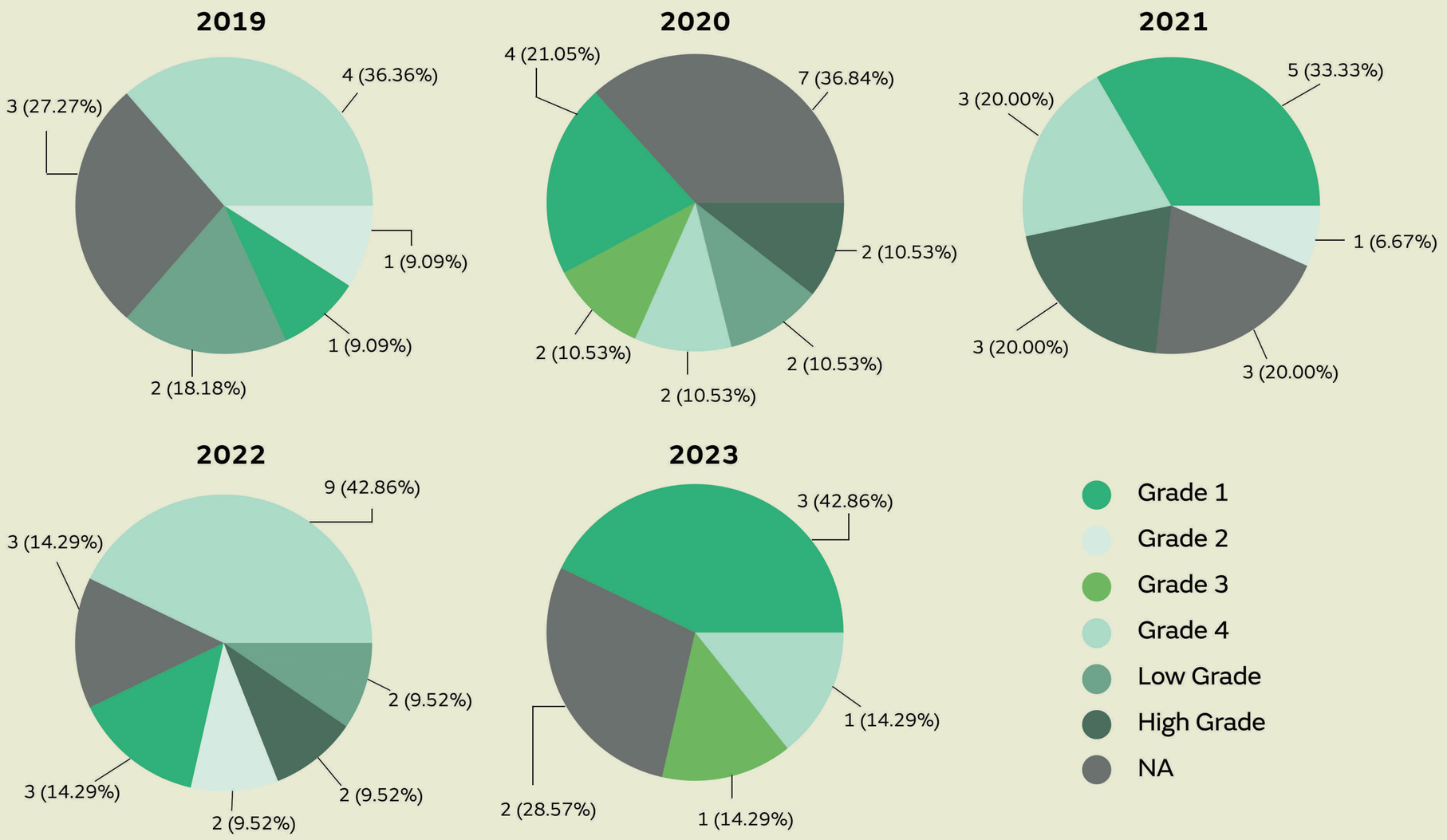


SIDRA MEDICINE PEDIATRIC CANCER REGISTRY

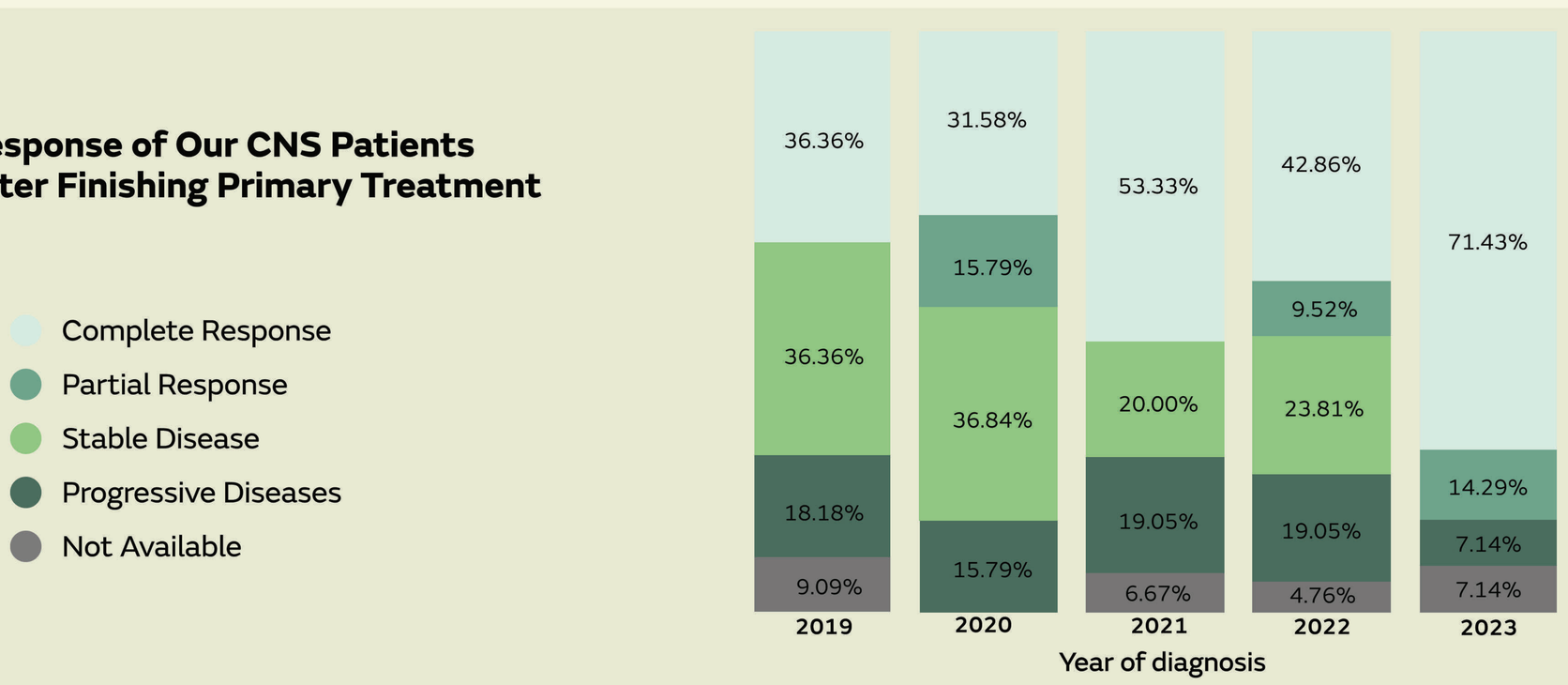
Central Nervous System Tumors

Distribution of ICDO3 Codes of Our CNS Patients

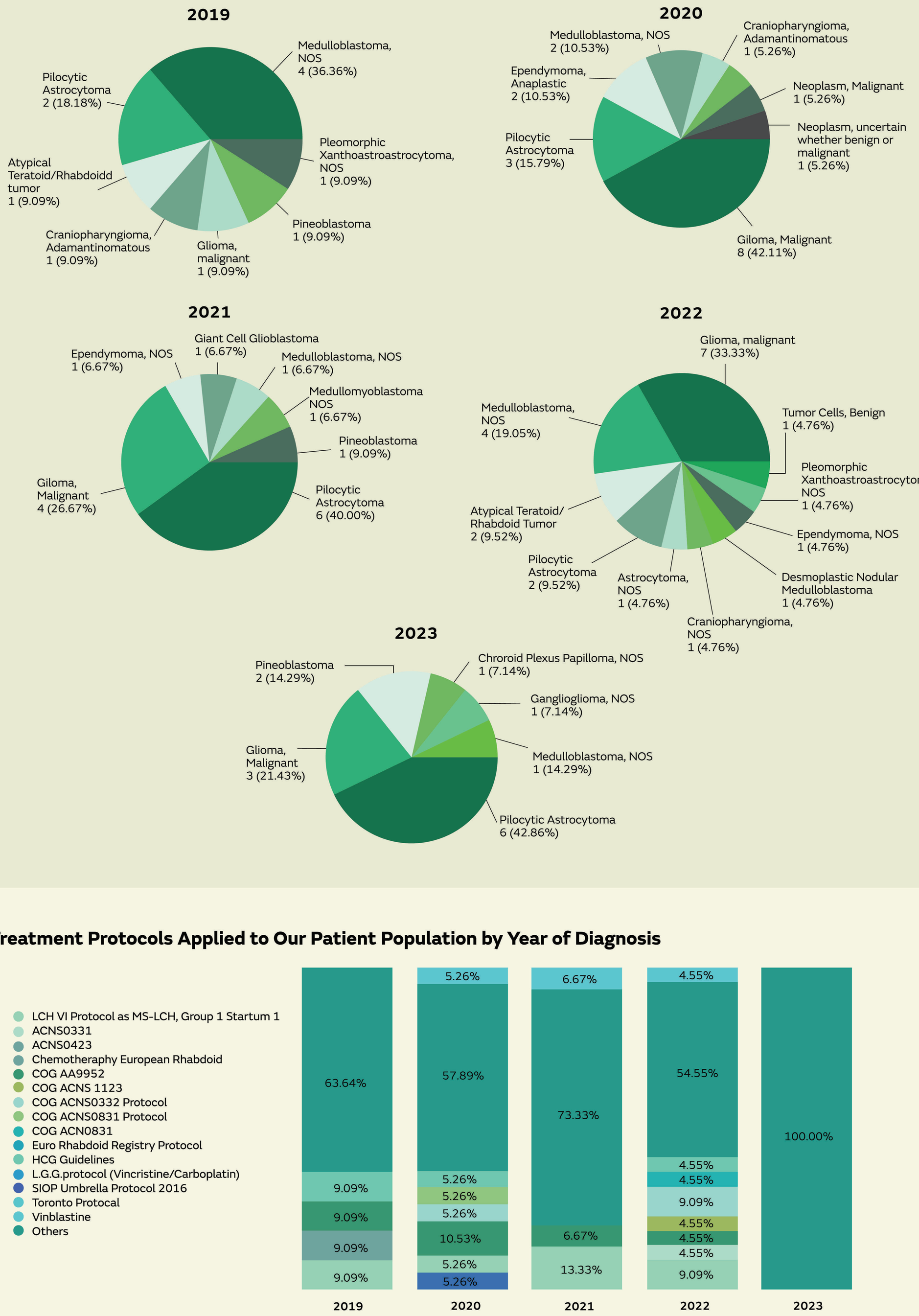
Cancer Grade of CNS Tumors at Diagnosis by Year



Response of Our CNS Patients After Finishing Primary Treatment



ICDO3 Codes by Year of Diagnosis



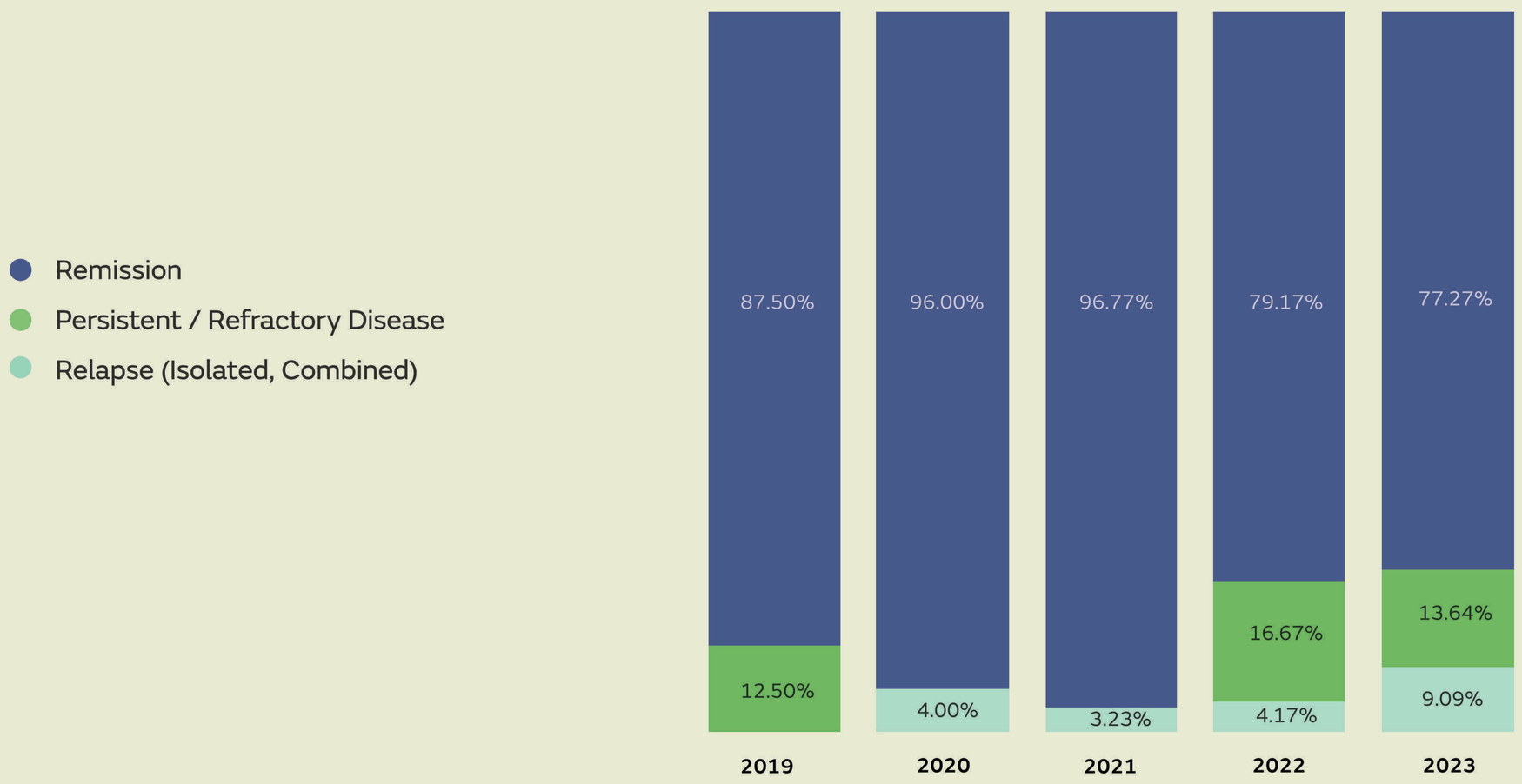
Treatment Protocols Applied to Our Patient Population by Year of Diagnosis

SIDRA MEDICINE PEDIATRIC CANCER REGISTRY

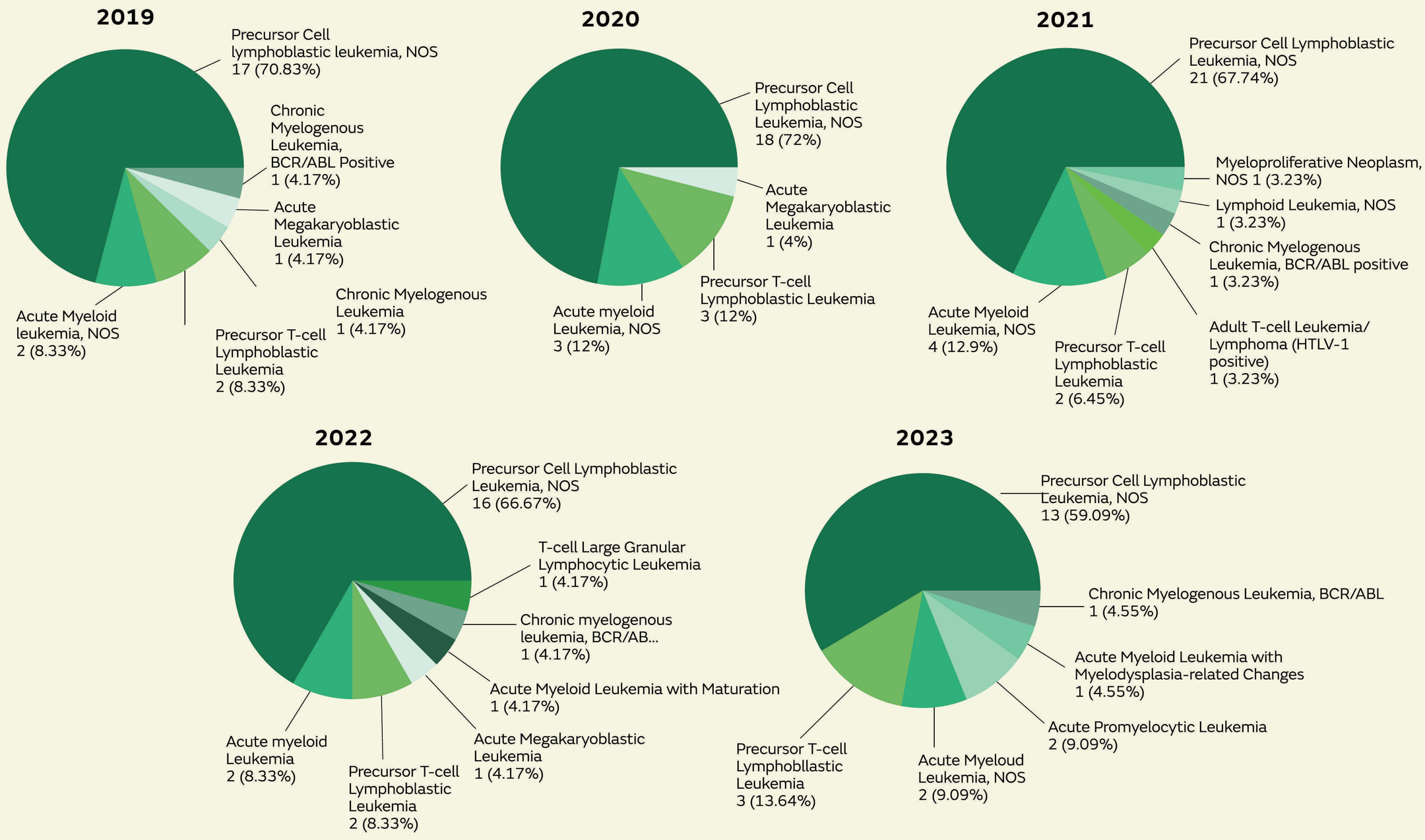
Leukemia

Distribution of ICDO3 Codes of Our Leukemia Patients

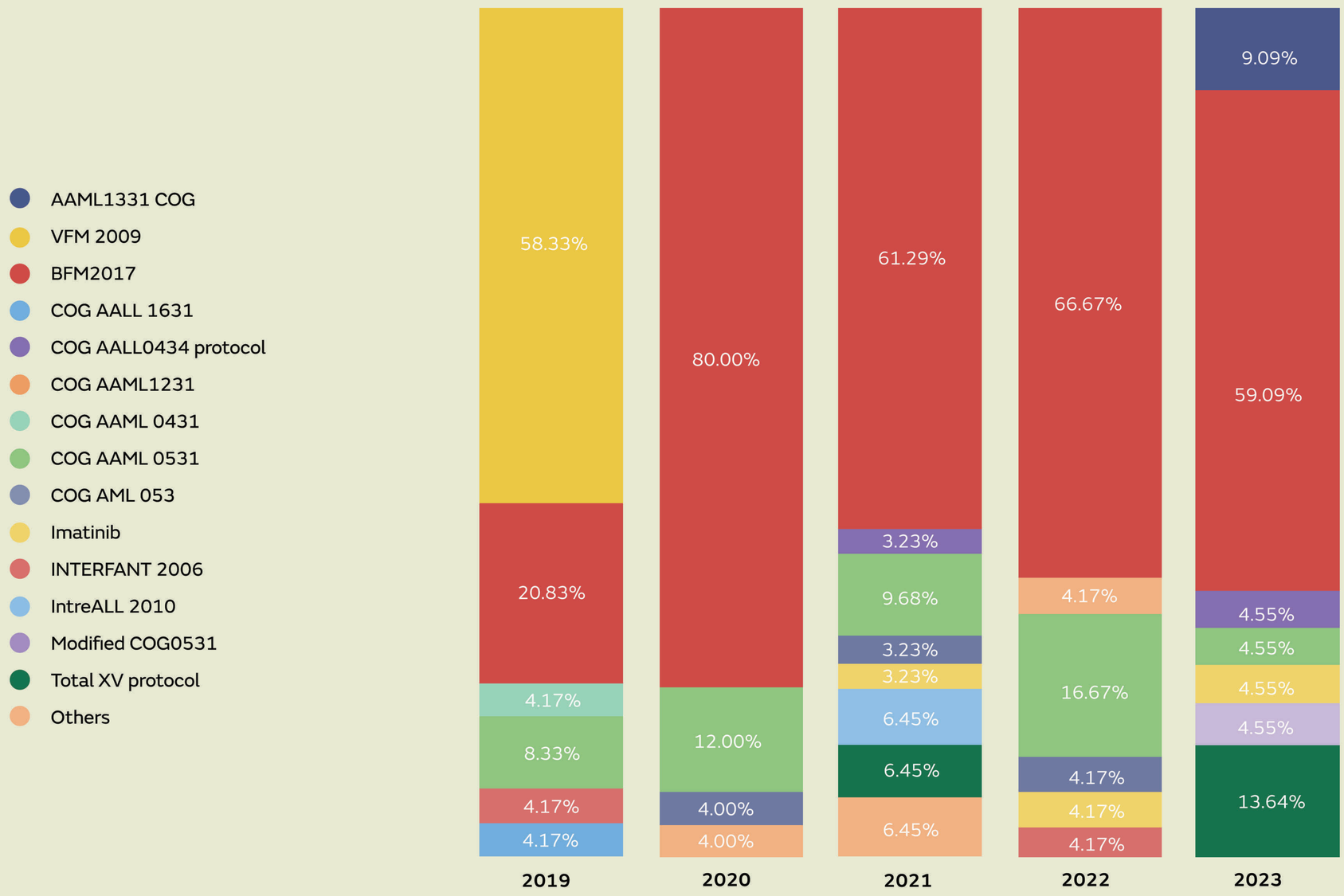
Response of Our Leukemia Patients After Finishing Primary Treatment by Year of Diagnosis



ICDO3 Codes by Year of Diagnosis



Treatment Protocols Applied to Our Patient Population by Year of Diagnosis



TEAM INTERVIEWS

Balancing Compassion, Care, and Cutting-Edge Research

Mohammed Anas is a Clinical Nurse Leader at the Hematology Oncology division. Specializing in pediatric oncology nursing allows him to use his skills in children's health in the fight against cancer. Anas balances the emotional challenges of his work by maintaining a professional yet compassionate demeanor, building strong relationships with patients and their families, and providing emotional support alongside exceptional care.

“My journey into pediatric oncology nursing was driven by my deep passion for caring for children and a personal experience with a young family member’s illness. The unique challenges and rewards of pediatric care, combined with the resilience of children battling cancer, solidified my decision to specialize in this field.

Balancing the emotional demands of working with young cancer patients involves maintaining a compassionate yet professional approach. Building strong relationships with patients and their families helps me provide emotional support and deliver exceptional care. One memorable experience was supporting a young patient through treatment side effects with play therapy and communication, ultimately seeing her regain her playful spirit and successfully complete treatment.

I’m motivated by the courage of my young patients and the progress in treatment advancements. I stay dedicated by keeping up with the latest research through conferences, workshops, and online resources. As a clinical nurse involved in research, I bridge the gap between patient care and research, offering valuable insights, educating patients, and contributing to advancements that improve outcomes in pediatric oncology.”

Arianne Alejo is a Clinical Nurse at the Hematology Oncology division. She has experience in both adult and childcare. Arianne finds it an honor to be part of the patient and family journey throughout their treatment process, despite the stressful situations. Her dedication to continuous learning includes participating in clinical trials, and professional development courses, and attending conferences and workshops to stay current with the latest research and developments in pediatric oncology.

“I began specializing in pediatric hematology oncology nursing in 2013 after transitioning from adult medical/surgical care. Initially, the shift was daunting, but the support from my colleagues made a significant difference. Despite the stress of the role, it’s a privilege to be involved in the treatment journeys of children and their families.

To handle the emotional challenges of this career, I focus on maintaining a positive outlook and setting boundaries to prevent burnout. The most memorable aspect of my work is seeing patients overcome cancer and return to a normal life, which provides immense personal and professional satisfaction.

My dedication to this field is fueled by a deep passion for oncology nursing and a desire for professional growth. I stay current with the latest research by engaging in continuous learning and participating in clinical trials. Although I initially wasn't aware of the research role, my involvement has allowed me to contribute innovative ideas that enhance patient care and outcomes."

Aisha Khalifa is a research coordinator working in the Clinical Trials Office (CTO). She has been a part of various studies from different specialties. Aisha's work is crucial in running smooth and ethical studies, which are vital for obtaining diverse and representative samples. Her efforts contribute significantly to the pediatric oncology research at our hospital.

"At Sidra Medicine, research coordination involves managing studies across various departments like oncology, genetics, and NICU. The role includes overseeing patient recruitment, ensuring protocol compliance, and maintaining accurate documentation. The advanced facilities and multidisciplinary team at Sidra Medicine support innovation in pediatric oncology research, enabling impactful studies with cutting-edge technology.

I'm motivated by the opportunity to make a significant impact on children and their families. To stay current with advancements in the field, I attend conferences, participate in professional development, and collaborate with colleagues. These efforts help me stay updated on the latest trends and innovations in pediatric oncology.

Enrolling pediatric oncology patients in research presents several challenges. I face issues such as obtaining informed consent, managing the emotional and physical burdens on patients and families, and addressing logistical challenges like coordinating study visits with treatment schedules. Balancing ethical concerns with research needs is also crucial."

Tumour Biology and Immunology Laboratory: Apryl Sanchez has been a Research Specialist I at Sidra Medicine since 2019. She manages the Sidra Pediatric Cancer Biobank samples and has helped establish standard operating procedures (SOPs) for sample management. Apryl also handles sample requests, transfers samples under controlled conditions, and conducts continuous quality monitoring. She is particularly fascinated by the genetic and molecular underpinnings of pediatric cancers, which directly influence the development of targeted therapies and improve patient outcomes.

"I've been involved in managing the Sidra Pediatric Cancer Biobank samples and establishing standard operating procedures for sample management. My responsibilities include coordinating the collection of biospecimens, logging them into the PRIME (Precision Research Information Management Environment) system, and performing processing tasks such as DNA and RNA extraction. I also ensure accurate sample labeling, storage, and data entry, maintain proper cryopreservation, and handle sample requests while conducting continuous quality monitoring.

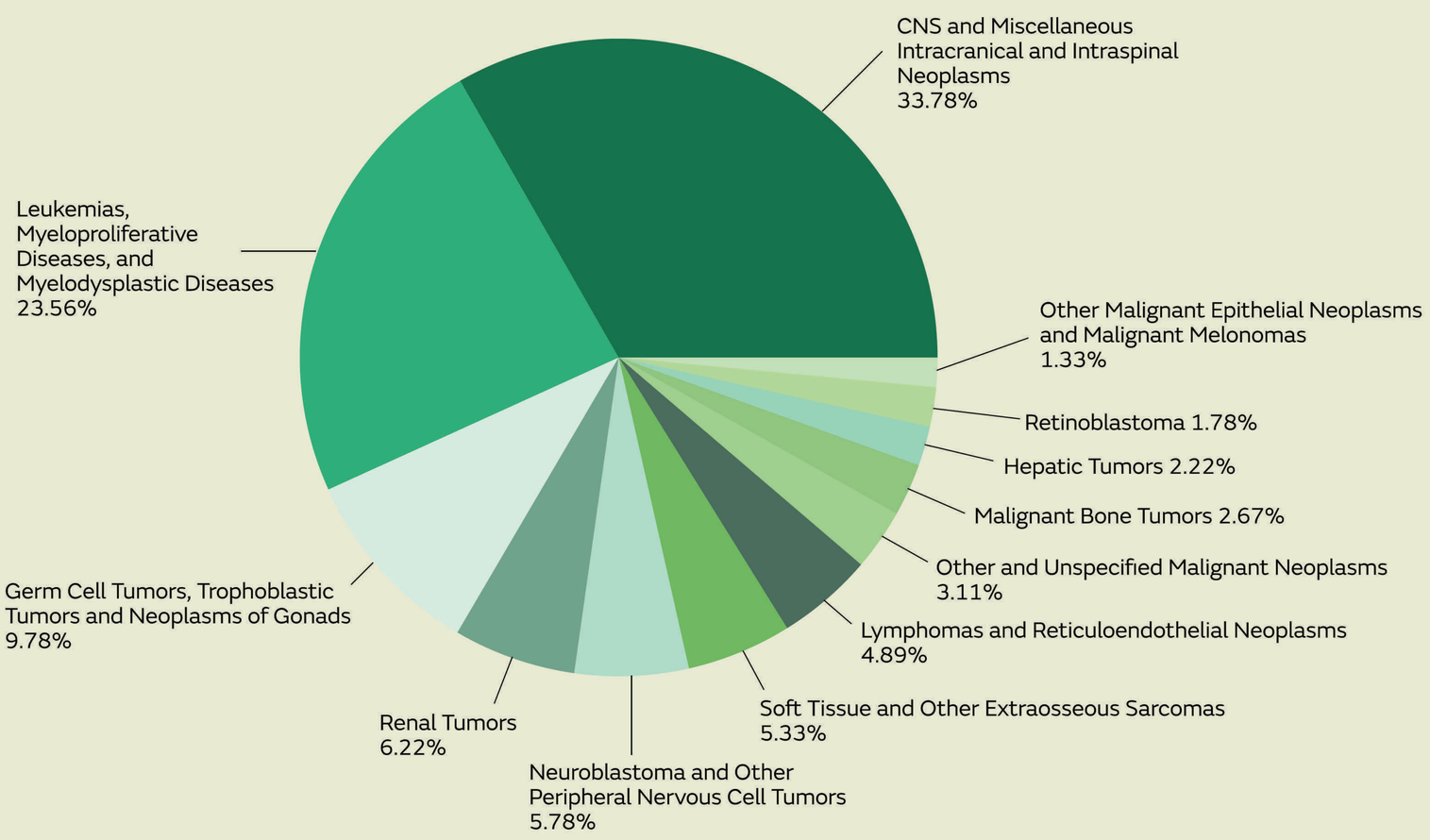
I'm particularly fascinated by the genetic and molecular aspects of pediatric cancers. This research area not only enhances our scientific understanding but also directly impacts the development of targeted therapies and molecular diagnostics. The Expedited Genomic Oncology Profiling (eGOP) workflow stands out to me as it provides detailed genetic information swiftly, enabling personalized treatment plans for our young patients and significantly improving their outcomes.

Automation in sample processing has made a significant impact on my work, streamlining our workflow and increasing accuracy in DNA and RNA extractions. Advances in next-generation sequencing and bioinformatics have enhanced our ability to screen for mutations, offering detailed insights into each patient's unique cancer profile. While managing biospecimens presents challenges, such as ensuring accuracy and integrity, it also offers opportunities to innovate and collaborate across departments, making our work both rewarding and impactful."

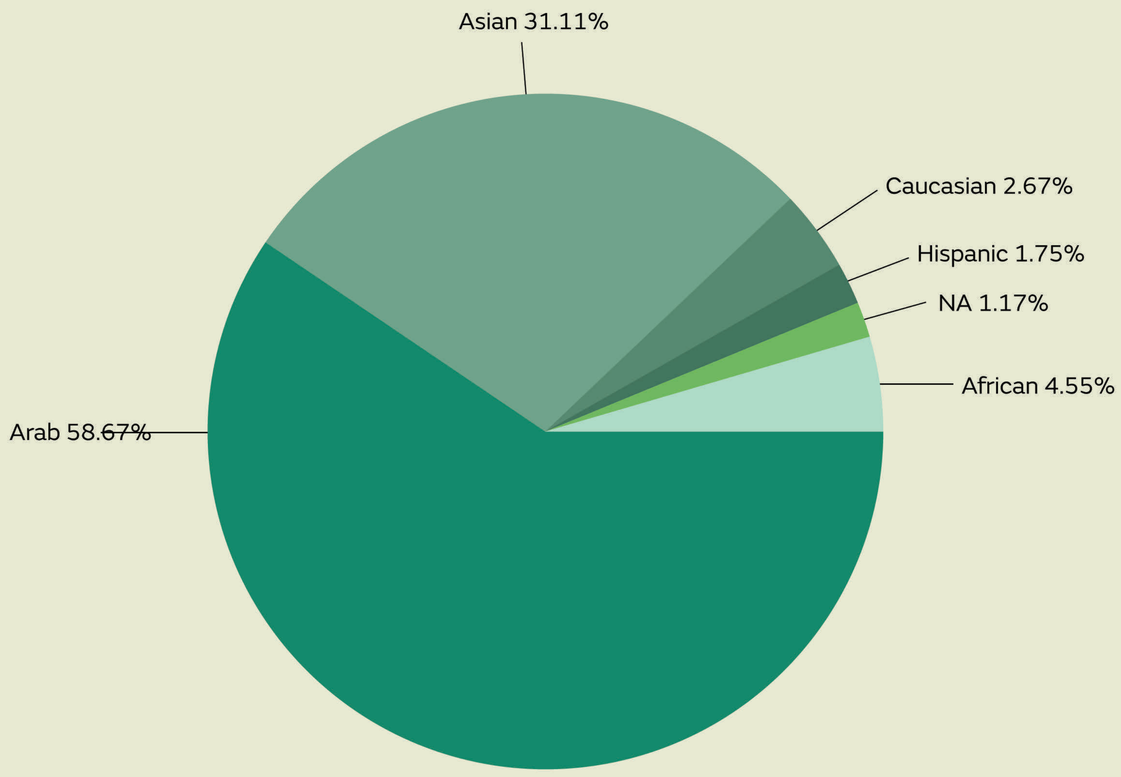
SIDRA MEDICINE PEDIATRIC CANCER

Biobank

Types of Pediactric Solid and Non-solid Cancer in the Biobank



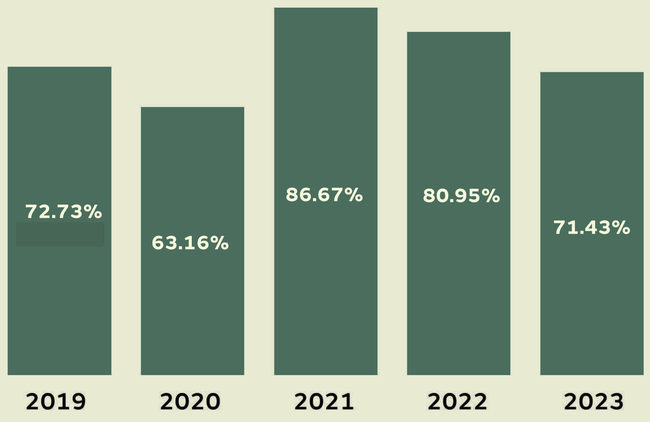
Biobank Ethnicity



Consent and Sampling Rates Per Cancer Type by Year of Diagnosis

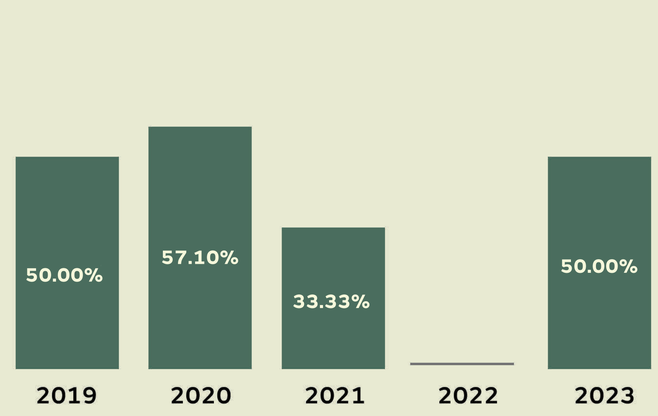
Consent Rate for CNS and Miscellaneous Intracranial and Intraspinal Neoplasms

77 53 36



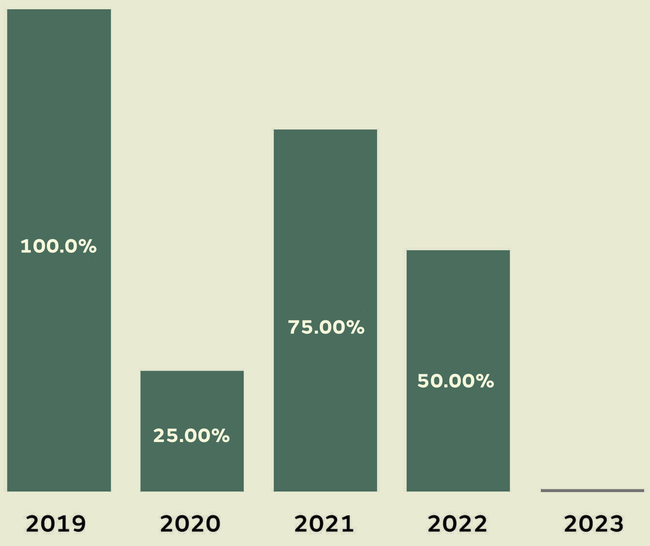
Consent Rate for Neuroblastoma and other peripheral Nervous Cell Tumors

13 9 5



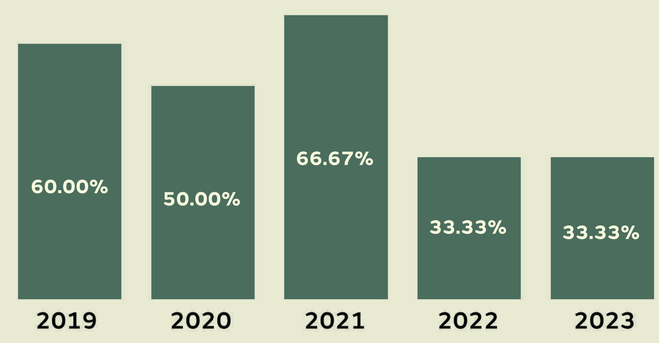
Consent Rate for Renal Tumors

14 9 3



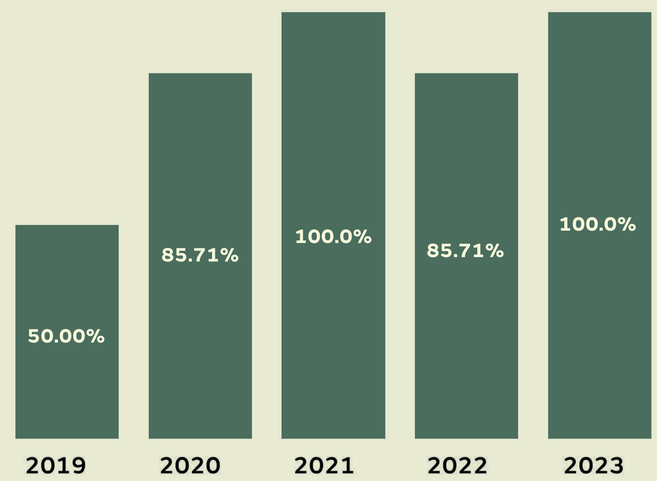
Consent Rate for Soft Tissue and Other Extraosseous Sarcomas

12 11 5



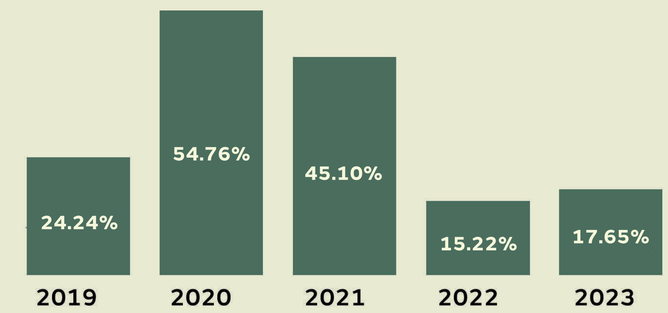
Consent Rate for for Germ Cell Tumors, trophoblastic Tumors, and Neoplasms of Gonads

22 21 6



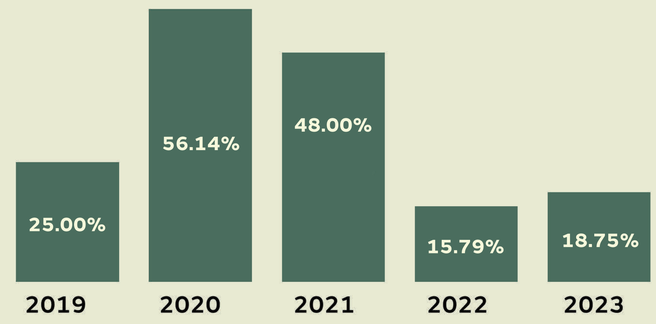
Other Consent Rate for Solid Tumors

35 26 9



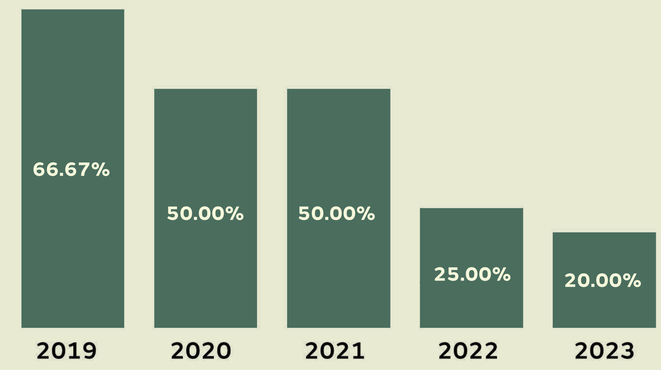
Consent Rate for Lymphoid Leukemias

45 45 45



Consent Rate for Acute Myeloid Leukemias

10 10 10



SNAPSHOTS OF PATIENTS' REPORTS

Personal Cancer Genome Reporter (PCGR)

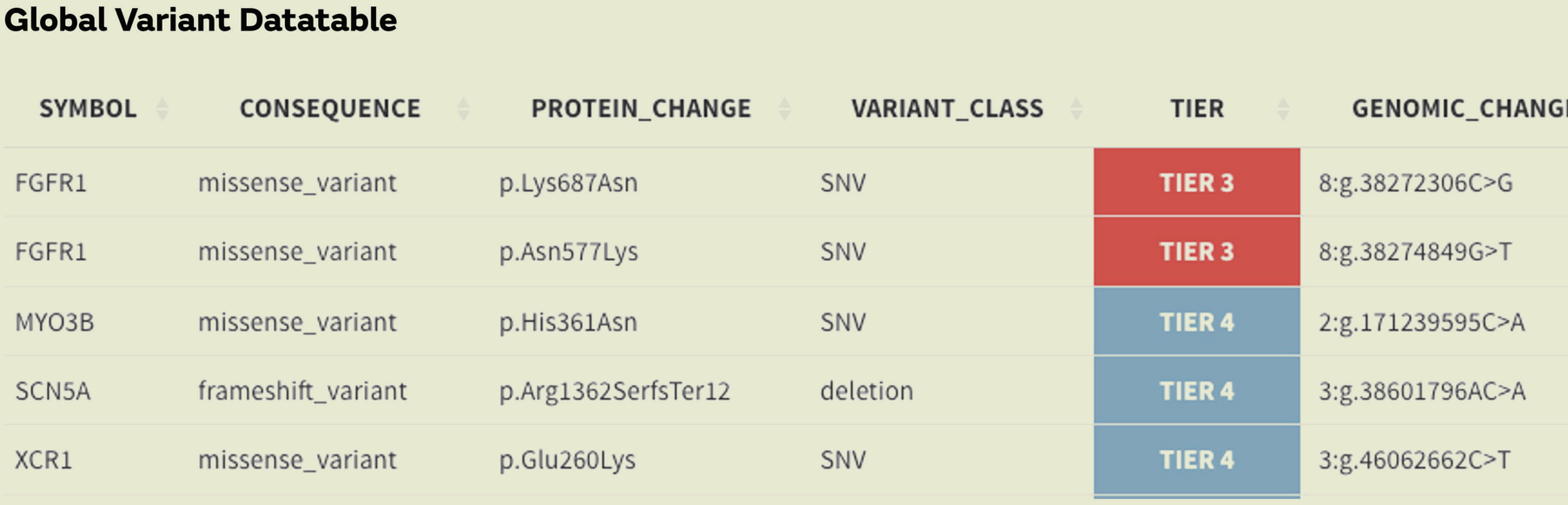
Somatic mutations are changes to a person's DNA that occurs after conception to any cell that isn't a germ cell (egg or sperm cell). Somatic or acquired genomic variants are the most common cause of cancer. In the SPCB, we are generating a PCGR report for each patient that interprets both somatic SNVs/InDels and copy number aberrations. The prioritization of SNV and InDels found in the tumor sample is done according to a four-tiered structure, adopting the joint consensus recommendation by Association for Molecular Pathology and American College of Medical Genetics and Genomics.

- Tier 1: Variants of strong clinical significance - constitutes variants linked to predictive, prognostic, or diagnostic biomarkers.
- Tier 2: Variants of potential clinical significance - constitutes other variants linked to predictive, prognostic, or diagnostic biomarkers.
- Tier 3: Variants of uncertain clinical significance - includes other coding variants found in oncogenes or tumor suppressor genes.
- Tier 4: includes other coding variants.

Global Variant Datatable

SYMBOL	CONSEQUENCE	PROTEIN_CHANGE	VARIANT_CLASS	TIER	GENOMIC_CHANGE
FGFR1	missense_variant	p.Lys687Asn	SNV	TIER 3	8:g.38272306C>G
FGFR1	missense_variant	p.Asn577Lys	SNV	TIER 3	8:g.38274849G>T
MYO3B	missense_variant	p.His361Asn	SNV	TIER 4	2:g.171239595C>A
SCN5A	frameshift_variant	p.Arg1362SerfsTer12	deletion	TIER 4	3:g.38601796AC>A
XCR1	missense_variant	p.Glu260Lys	SNV	TIER 4	3:g.46062662C>T

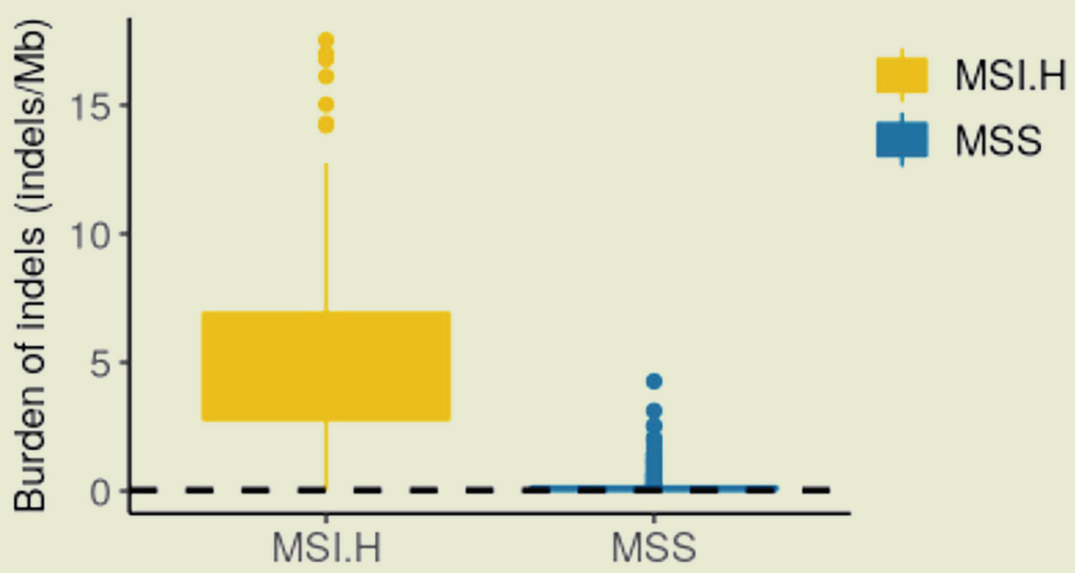
Allelic Support Plot



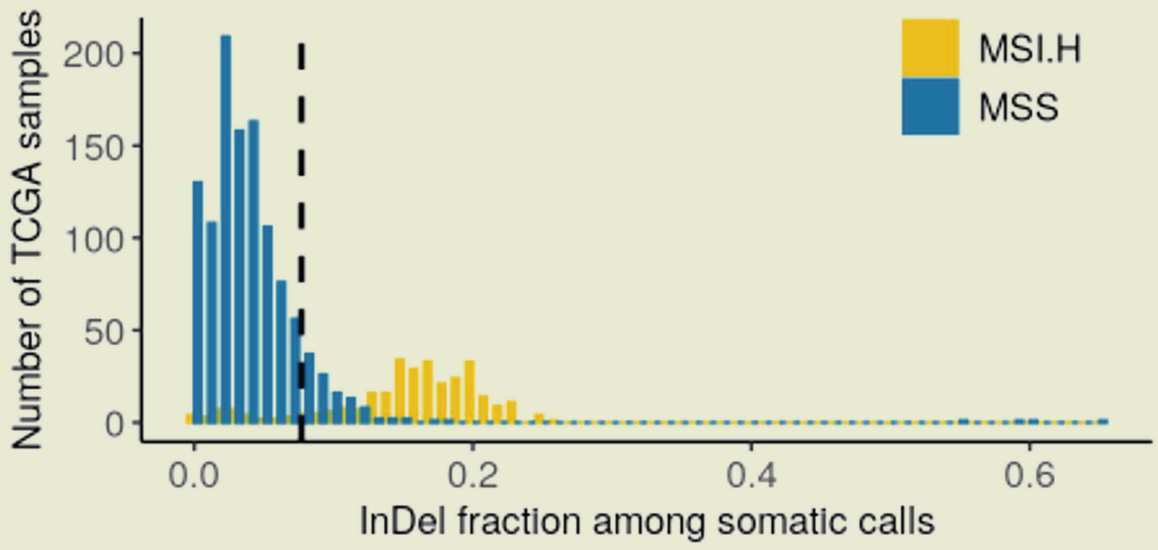
Molecularly Targeted Trials

	NCT_ID	TITLE	OVERALL_STATUS	CONDITION	KEYWORD	INTERVENTION	PHASE
1	NCT02887040	Study of Antineoplaston Therapy + Radiation vs. Radiation Only in Diffuse, Intrinsic, Brainstem Glioma	Not yet recruiting	Brainstem glioma	Radiotherapy	Antineoplaston A10, Antineoplaston AS2-1	3
2	NCT04425798	Connectivity Alterations After Levetiracetam Application	Not yet recruiting	Glioma	Radiotherapy		
3	NCT02432417	The Addition of Chloroquine to Chemoradiation for Glioblastoma,	Not yet recruiting	Glioblastoma	Chemoradiotherapy, Immunotherapy, Radiotherapy	Chloroquine	2
4	NCT04141319	Effects of Pre-emptive Scalp Infiltration With Ketorolac and Ropivacaine for Post-craniotomy Pain	Not yet recruiting	Neoplasm of brain	Radiotherapy	Ropivacaine, Ketorolac, Epinephrine	4
5	NCT04319276	Oral Gallium Maltolate for the Treatment of Relapsed and Refractory Glioblastoma	Not yet recruiting	Glioblastoma	Radiotherapy	Gallium Maltolate	1

MSI Evidence I: Mutational Burden of Indels



MSI Evidence II



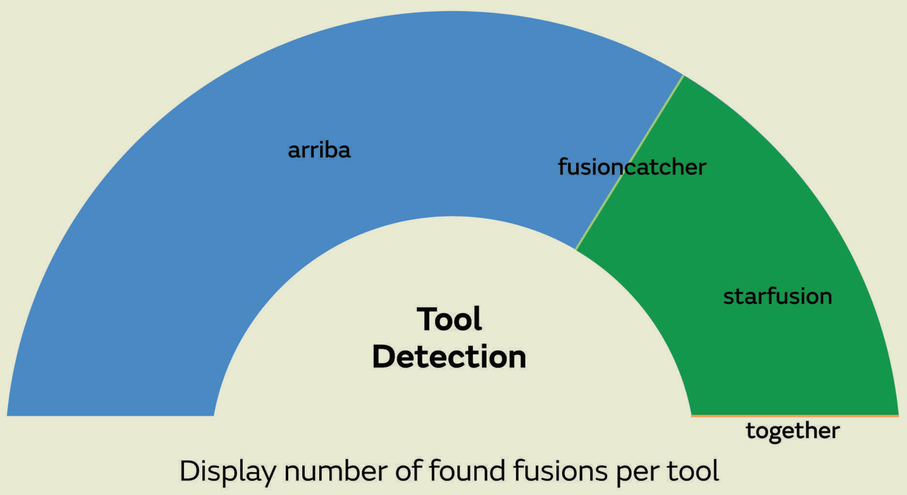
SNAPSHOTS OF PATIENTS' REPORTS

Fusion Reports

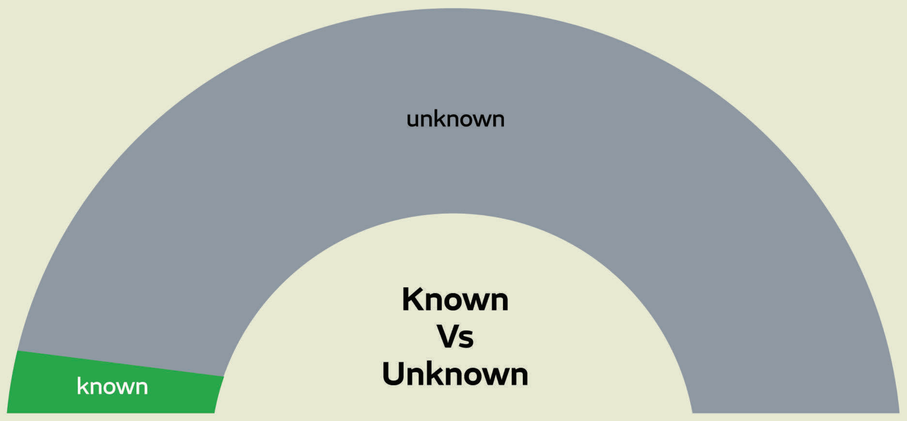
A fusion gene is defined as two genes that are joined so that they are transcribed and translated as a single unit. Fusion proteins produced by this change may lead to the development of some types of cancer.

We are generating a fusion report for each patient through implementing a bioinformatics analysis pipeline for RNA sequencing using 3 tools for detecting and visualizing fusion genes.

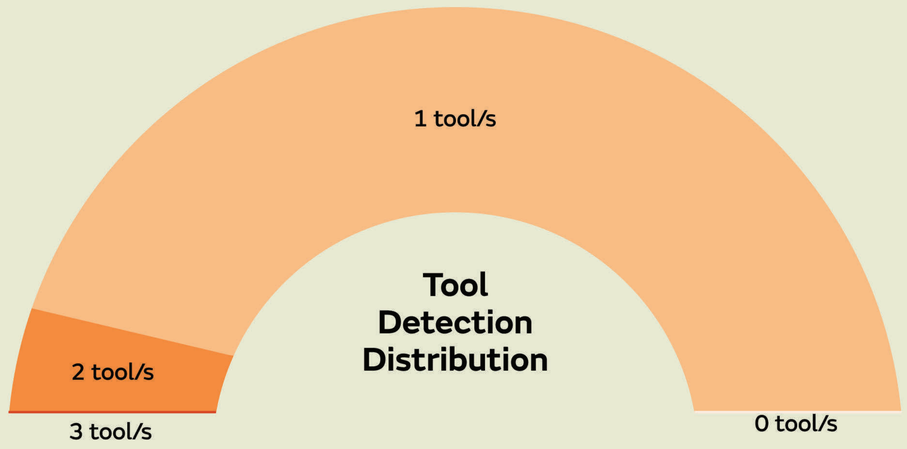
Dashboard Fusion Summary



Display number of found fusions per tool



Shows the ration between found and unknown missing fusions in the local database



Sum of counts detected by different tools

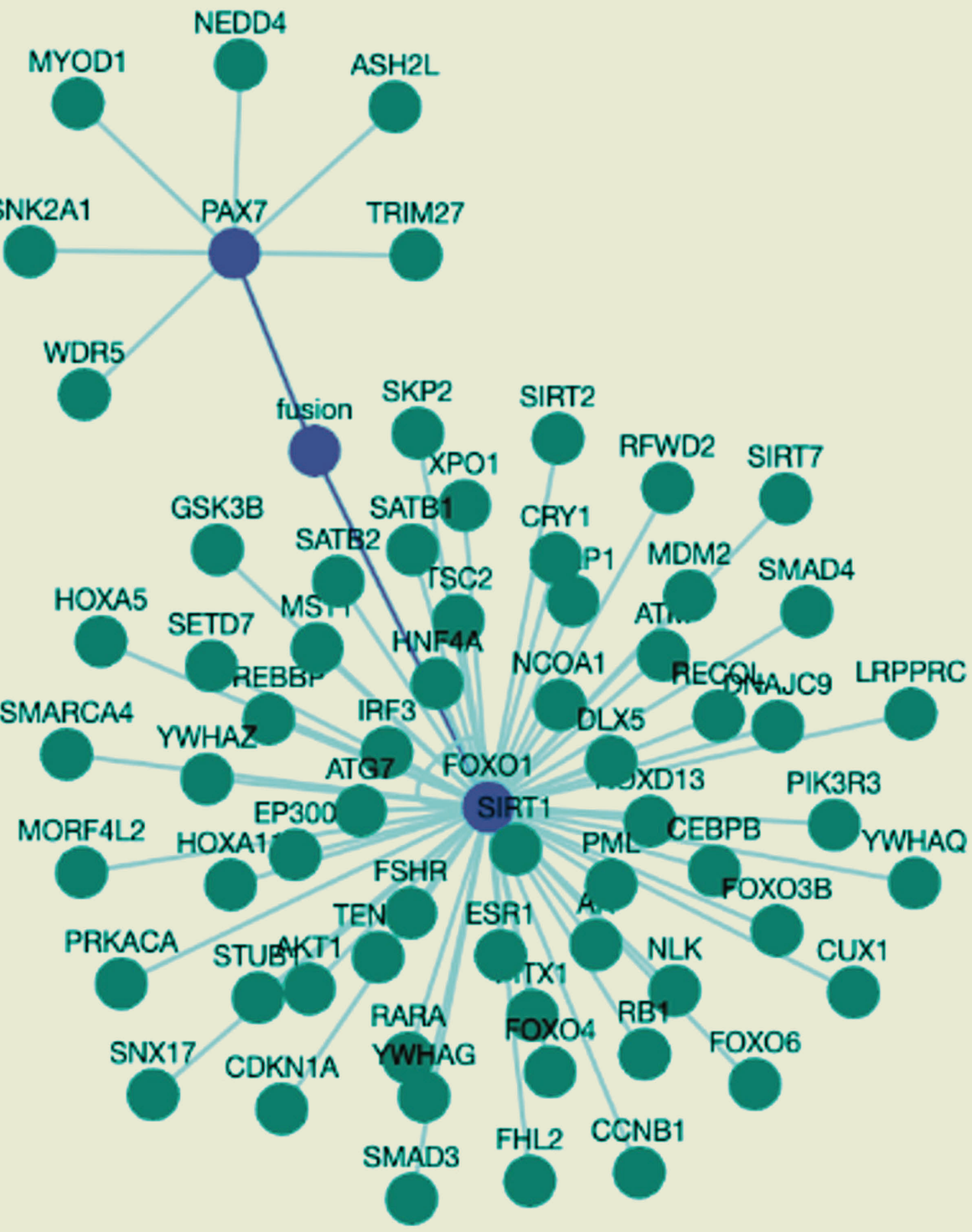
List of Detected Fusions

Fusion Gene	Found in DB	arriba	fusioncatcher	starfusion	Tools hits	Score
PAX7--FOXO1	FusionGDB	✓	✗	✓	2	0.243
SETBP1--AL357509.1	Not found	✓	✗	✓	2	0.143
KANSL1--ARL17B	Not found	✗	✗	✓	1	0.071
AC092691.1--LSAMP	Not found	✗	✗	✓	1	0.071

Related Diseases

Gene (Disease ID)	Disease Description	Disease Probaility (%)	Disease Publications	Disease Source
FOXO1 (C0206655)	Alveolar Rhabdomyosarcoma	64.61	0	CTD_human, HPO, ORPHANET
PAX7 (C0206655)	Alveolar Rhabdomyosarcoma	61.84	0	CTD_human, HPO, ORPHANET
PAX01 (C0023467)	Leukemia, Myelocytic, Acute	20.33	1	CTD_human
FOXO1 (C0022578)	Keratocnous	20.11	1	CTD_human

Chimeric Protein-Protein Interactions



SNAPSHOTS OF PATIENTS' REPORTS

Cancer Predisposition Sequencing Reporter (CPSR)

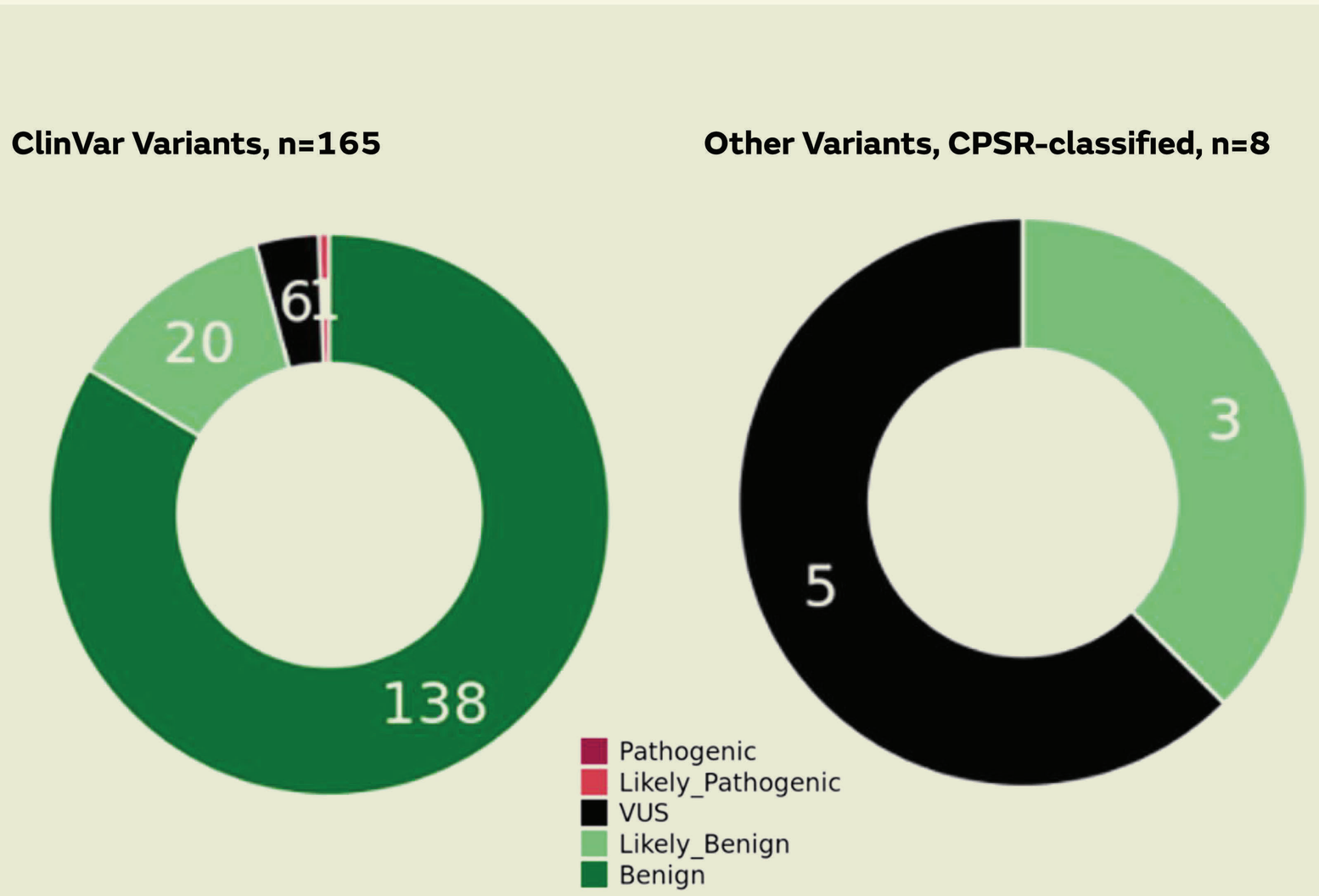
Cancer predisposition gene is a term used to describe a gene that may increase a person's risk of developing some types of cancer if it has certain mutations (changes).

We are generating a CPSR for each patient. The CPSR is a computational workflow that interprets and classifies germline DNA variants identified from next-generation sequencing in the context of cancer predisposition and inherited cancer syndromes.

Variants classification

Pathogenic variant is a genetic alteration that increases an individual's susceptibility or predisposition to a certain disease or disorder. Variants are classified based on the pathogenicity into different classes ordered by highest pathogenicity:

1. Pathogenic Variants
2. Likely Pathogenic Variants
3. Variants of Uncertain Significance (VUS)
4. Likely Benign Variants
5. Benign Variants



Likely Pathogenic variant detected in one of SPCB patients

SYMBOL	CLINVAR_PHENOTYPE	CONSEQUENCE	PROTEIN_CHANGE	GENOTYPE
MUTYH	Colon cancer; Endometrial cancer; Hereditary cancer-predisposing syndrome; Neoplasm of stomach; Pilomatrixoma; Breast carcinoma; Carcinoma of colon; Small intestine carcinoid; MYH-associated polyposis; Ovarian carcinoma; Colorectal adenomatous polyposis, autosomal recessive, with pilomatricomas; not specified; not provided	missense_variant, splice_region_variant	p.Gly368Asp	heterozygous

Biomarkers

	SYMBOL	GENE_NAME	CANCER_TYPE	CLINICAL_SIGNIFICANCE	EVIDENCE_LEVEL
1	SH2B3	SH2B adaptor protein 3	Colorectal Cancer	Positive	B: Clinical evidence
2	TP53	tumor protein p53	Breast Cancer	Positive	B: Clinical evidence

GWAS Hits

	SYMBOL	CONSEQUENCE	GWAS_CITATION	PROTEIN_CHANGE	GENOTYPE
1	MTMR11	missense_variant	Breast Carcinoma, Michailidou et al., 2017, Nature (association p-value =1.0e-14); Breast Carcinoma, Rashkin et al., 2020, Nat Commun (association p-value =5.0e-07)	p.Met159Val	heterozygous
2	CERS2	missense_variant	Cancer, Brandes et al., 2021, Sci Rep (association p-value =2.0e-07)	p.Glu115Ala	heterozygous
3	R3HDM1	missense_variant	Colorectal Cancer, Huyghe et al., 2021, Gut (association p-value =3.0e-08)	p.His544Arg	homozygous
4	TTN	missense_variant	Acute Myeloid Leukemia, Lv et al., 2016, Oncotarget (association p-value =2.0e-12); Acute Myeloid Leukemia, Lv et al., 2016, Oncotarget (association p-value =4.0e-07)	p.Val3261Met	homozygous

SNAPSHOTS OF PATIENTS' REPORTS

Methylation Profiling Report

GERMAN CANCER RESEARCH CENTER IN THE HELMHOLTZ ASSOCIATION

Heidelberg University Hospital

MolecularNeuropathology.org

Supplier Information

Material type: NA

Gender: male Supplier diagnosis: CNS

Automatic Prediction

Array type: EPIC

Material type: DNA-FFPE

Gender: unknown

Legend

✓ Ok

! Supplier information or prediction not available

✗ Warning, mismatch of prediction and supplier information

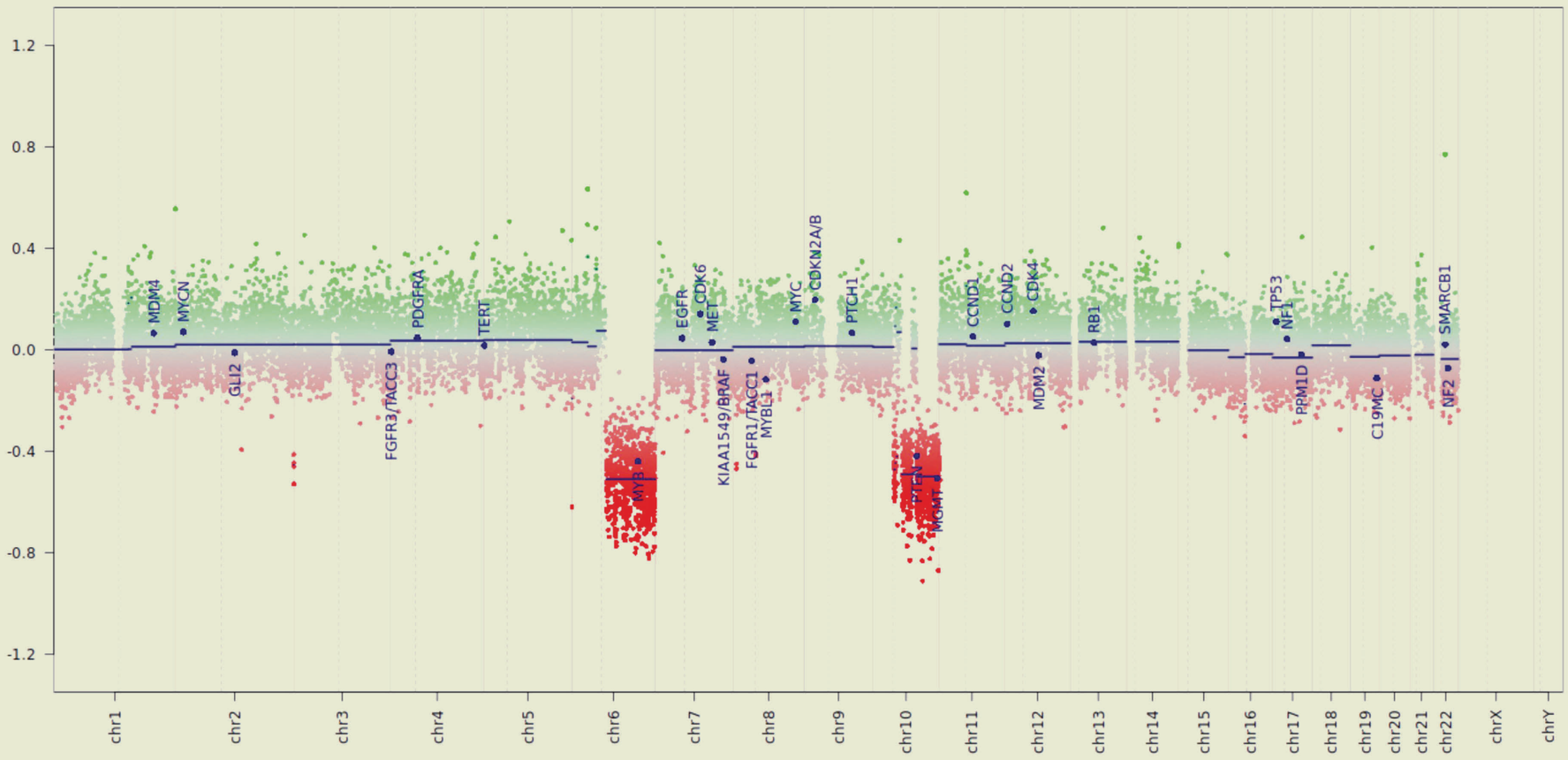
Classification Match

Version 12.8 of the brain classifier results

Methylation classes (Highest level >= 0.3, lower levels >= 0.1, all of lowest level)	Calibrated score	Interpretation	
Ependymal Tumours	0.99	match	✓
Posterior Fossa Ependymoma Group A	0.99	match	✓
Posterior Fossa Ependymoma Group A1	0.99	match	✓
Mc Posterior Fossa Group A (pfa) Ependymoma, Subclass 1e (novel)	0.97	match	✓
Mc Posterior Fossa Group A (pfa) Ependymoma, Subclass 1d (novel)	0.01	no match	✗
Mc Posterior Fossa Group A (pfa) Ependymoma, Subclass 1c (novel)	0.00	no match	✗
Mc Posterior Fossa Group A (pfa) Ependymoma, Subclass 1a (novel)	0.00	no match	✗
Mc Posterior Fossa Group A (pfa) Ependymoma, Subclass 1b (novel)	0.00	no match	✗
Mc Posterior Fossa Group A (pfa) Ependymoma, Subclass 1f (novel)	0.00	no match	✗

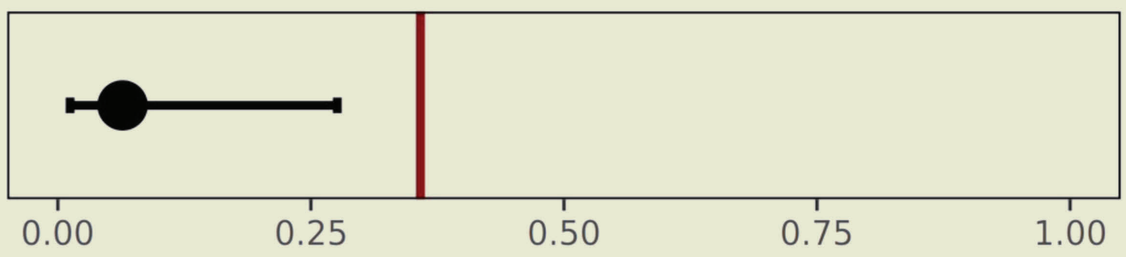
Legend: ✓ Match (score >= 0.9) ✗ No match (score < 0.9): possibly still relevant for low tumor content and low DNA quality cases.

Copy Number Variation Profile



Depiction of chromosome 1 to 22 (and X/Y if automatic prediction was successful). Gains/amplifications represent positive, losses negative deviations from the baseline. 29 brain tumor relevant gene regions are highlighted for easier assessment. (see Hovestadt & Zapatka, http://www.bioconductor.org/packages/devel/bioc/html/conumee.html)

MGMT Promoto Status Prediction

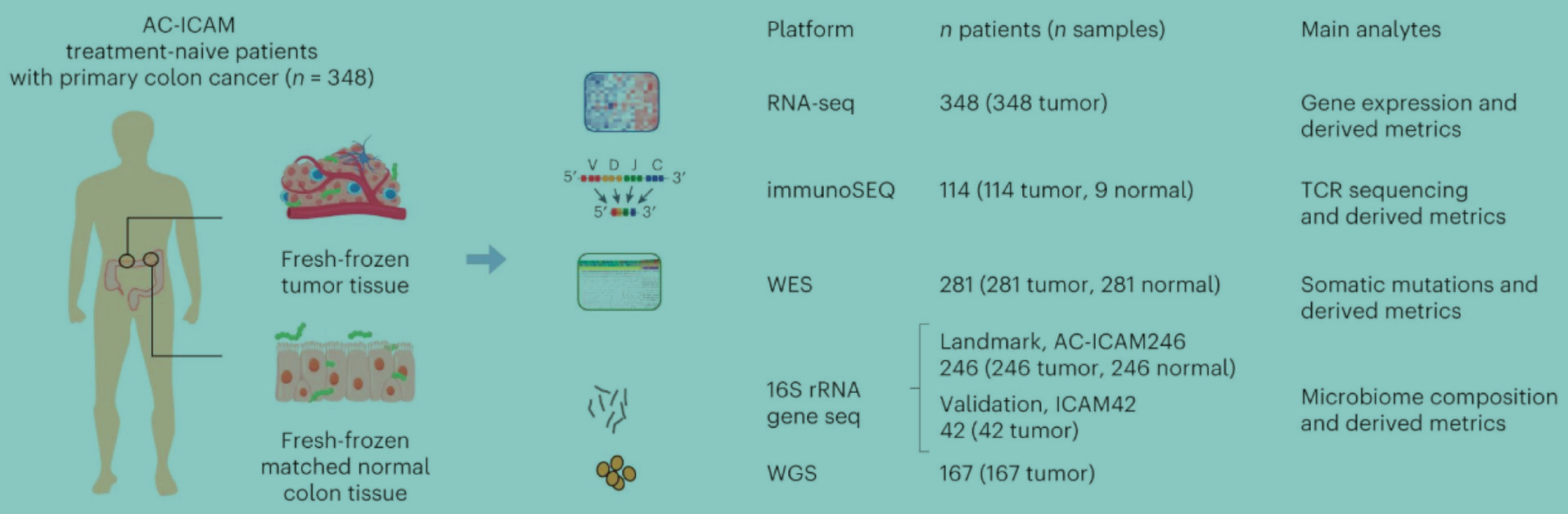


Status	Estimated	CI lower	CI upper
unmethylated	0.06392	0.01208	0.27607

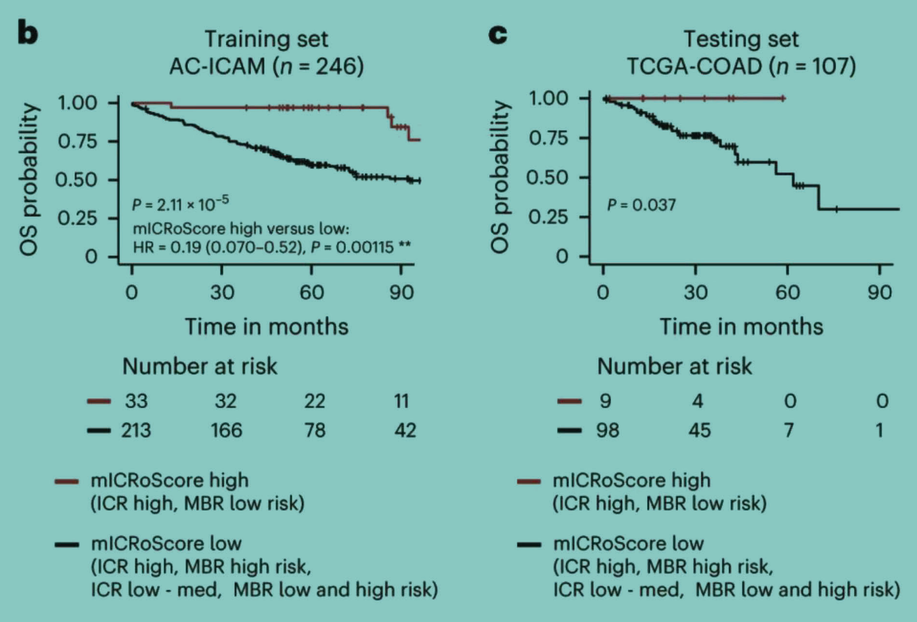
PUBLICATION

Our Recent Publication on Colon Cancer

In May 2023 our team published **“An integrated tumor, immune and microbiome atlas of colon cancer”** paper. DOI https://doi.org/10.1038/s41591-023-02324-5



Abstract: The lack of multi-omics cancer datasets with extensive follow-up information hinders the identification of accurate biomarkers of clinical outcome. In this cohort study, we performed comprehensive genomic analyses on fresh-frozen samples from 348 patients affected by primary colon cancer, encompassing RNA, whole-exome, deep T cell receptor and 16S bacterial rRNA gene sequencing on tumor and matched healthy colon tissue, complemented with tumor whole-genome sequencing for further microbiome characterization. A type 1 helper T cell, cytotoxic, gene expression signature, called Immunologic Constant of Rejection, captured the presence of clonally expanded, tumor-enriched T cell clones and outperformed conventional prognostic molecular biomarkers, such as the consensus molecular subtype and the microsatellite instability classifications. Quantification of genetic immunoediting, defined as a lower number of neoantigens than expected, further refined its prognostic value. We identified a microbiome signature, driven by Ruminococcus bromii, associated with a favorable outcome.



By combining microbiome signature and Immunologic Constant of Rejection, we developed and validated a composite score (mICRoScore), which identifies a group of patients with excellent survival probability. The publicly available multi-omics dataset provides a resource for better understanding colon cancer biology that could facilitate the discovery of personalized therapeutic approaches.

PATIENTS' INTERVIEWS

A Journey of Hope

When their two-year-old child was diagnosed with Burkitt's Lymphoma, the young parents felt their world shift beneath them. Desperate for answers and specialized care, they found themselves at the doors of Sidra Medicine.

The medical team at Sidra Medicine didn't just treat their child's illness; they embraced the family with warmth, professionalism, and a level of attentiveness that brought them comfort when they needed it most.

The days that followed were some of the hardest they had ever faced. Watching their little one endure diagnostic procedures and chemotherapy was a challenge they were not prepared for. Yet amid the difficult moments, the family found a lifeline.

The family was introduced to Sidra Medicine's Precision Oncology Initiative, a pioneering initiative focused on advancing cancer treatment, through cutting-edge research. This initiative involves the collection, storage, and use of tissue samples and health information to facilitate scientific studies. One of the key research methods used is whole genome sequencing (WGS), which enables researchers to analyze a child's genetic code in detail. While genetic alterations often occur only in tumors, identifying these changes can help oncologists tailor the child's treatment plan more effectively. In addition, it provides valuable insights for researchers and physicians working to better understand the disease. After thorough analysis, the child's treating physician will receive a detailed report on the genetic alterations found in the tumor. This report is reviewed by a "molecular board" consisting of experts in oncology, pathology, genetics, and research, who advise the family on the findings and their implications for potential therapies. In the future, other researchers may request access to the biorepository to use the samples for further studies.

The family said: "We believe this research will be valuable and save others this ordeal."

When asked what message he would like to share with other families facing similar challenges, the family's response was heartfelt and full of hope: "Faith in God and His will, above all else. Sidra Medicine is highly professional and provides exceptional care to its patients. The care was excellent and exceeded our expectations."

For this family, Sidra Medicine wasn't just a hospital; it became a beacon of hope and a place where they could believe in a brighter future for their child. Their journey is a testament to the power of exceptional care, ground-breaking treatment protocols, and the belief that every small step forward matters.

Cancer Grant Awards

No.	Grant Reference	Lead Principal Investigator	Title
1	IRF22 (Internal Grants)	Dr. Wouter Hendrickx & Dr. Erdener Ozer	Pediatric solid tumor heterogeneity and clinical impact by multi-regional NGS @ Sidra Medicine
2	IRF22 (Internal Grants)	Dr. Wouter Hendrickx & Dr. Atta Maaz	Implementation of spatially resolved transcriptomics in pediatric brain tumors: toward advanced diagnostics enabling precision immunotherapeutic approaches.
3	IRF24 (Internal Grants)	Dr. Christophe Raynaud & Dr. Ayman Saleh	Prognostic and therapeutic potential of SLFN11 in Pediatric solid tumors
4	IRF24 (Internal Grants)	Dr. Erdener Ozer & Dr. Wouter Hendrickx	Integrative application of high-resolution Single-cell ATAC and RNA sequencing in clinical decision-making of neuroblastoma patients
5	NPRP10-0129-170277 (External – QNRF)	Dr. Cristina Maccalli	Mapping genotype to phenotype for breast and colorectal cancer stem cells: Implications and perspectives in cancer therapy
6	NPRP11S-0121-180351 (External – QNRF)	Dr. Davide Bedognetti	Towards personalize cancer medicine: Immunoscore and immunogenomic score in primary and metastatic colorectal cancer patients from Europe and Qatar.
7	NPRP13S-0107-200023 (External – QNRF)	Dr. Sara Deola	Mapping the road of GVHD and GVT. Multicenter Prospective Study of the "Transcriptome Fingerprinting" Post Allogeneic Hematopoietic Stem Cell Transplantation Using System Immunology Approach
8	PPM 04-0128-200014 (External – QNRF)	Dr. Naima Al-Mulla	Pharmacogenetics in childhood acute lymphoblastic leukemia: from variants identification to clinical implementation.
9	PPM 05-0316-210001 (External – QNRF)	Dr. Wouter Hendrickx	Multiregional genomic sequencing of pediatric cancer patients from Qatar, solid tumor heterogeneity and clinical impact.
10	ARG01-0507-230085 (External – QNRF)	Dr. Wouter Hendrickx	Recapitulation of the human microbiome risk score in mice to elucidate its mechanism of action.

Publication List (2021- 2023)

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PEDIATRIC BLOOD & CANCER, 2023
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Prognostic impact of pre-referral tumor resection in unilateral Wilms tumor: A single-institute experience from a lower middle-income country
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Stage I epithelial or stromal type Wilms tumors are low risk tumors: An analysis of patients treated on the SIOP-WT-2001 protocol in the UK-CCLG and GPOH studies (2001-2020).
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