Nicholas S. Phillips, MD, PhD Department of Epidemiology and Cancer Control St. Jude Children's Research Hospital 262 Danny Thomas Place MS-735 Memphis, Tennessee 38105-2794 Telephone: (901) 595-6092 Email: Nicholas.Phillips@StJude.org

1.	Current Position at St. Jude Faculty Research Associate Department of Epidemiology and Cancer Control St. Jude Children's Research Hospital Memphis, TN	2020 - Present
2.	Education and Training AS, General Science, Pellissippi State Technical Community College BA, Biochemistry, Maryville College MD, Medicine, University of Tennessee Health Science Center PhD, Biomedical Engineering, University of Tennessee Health Science Center Internship, Pediatrics, University of Tennessee Health Science Center Residency, Child Neurology, University of Tennessee Health Science Center Clinical Fellowship, Cancer Survivorship, St. Jude Children's Research Hospital Research Fellowship, Neuroscience, St. Jude Children's Research Hospital	1996 - 1998 1998 - 2000 2000 - 2009 2002 - 2009 2010 - 2011 2009 - 2013 2016 - 2017 2017 - 2020
3.	Key Accomplishments Summary International Cognition and Cancer Task Force Young Investigator Award American Academy of Neurology Medical Student Prize in Neurology (monetary award) University of Tennessee Outstanding Student Award in Neurology Clerkship Plenary Session Presentation, Radiological Society of North America Winner Best Paper SENRS, American Society of Neuroradiology LeQuire Award, Maryville College (monetary award) Alpha Sigma Lambda inductee, Maryville College Phi Theta Kappa Scholarship (2 years) All-Tennessee Academic Team Award, Phi Theta Kappa All-USA Academic Team nominee, AACC, PTK and USA Today	2018 2009 2009 2004 2003 2000 2000 1998 - 2000 1998 1998
4.	Professional Career Medical Extern Department of Surgery University of Tennessee Health Science Center Memphis, TN	2002 - 2005
5.	Certifications and Licensure Medical License (active) License #60465 State of Tennessee	2020-2023
	DEA License (pending) State of Tennessee Medical X-ray Operator-Limited Certification License #2855	2020 1995 - 1999
_	State of Tennessee	
6.	Professional Memberships Member, Student Surgical Society Chapter: University of Tennessee Health Science Center President, Student Surgical Society Chapter: University of Tennessee Health Science Center	2000 - 2004 2002 - 2003

	Member, American Society of Functional Neuroradiology Student Member, American Academy of Pediatrics Student Member, American Academy of Neurology Member, Children's Oncology Group Member, American Society of Clinical Oncology Member, Cognitive Neuroscience Society	2003 – 2015 2010 - 2013 2011 - 2013 2016 - Present 2016 - Present 2020 - Present
7.	Editorial Board Appointments Ad-Hoc Reviewer: Acta Oncologica Brain and Behavior Brain Connectivity Cancer Epidemiology. Biomarkers & Prevention Journal of Pediatric Hematology/Oncology	
8.	Grant Review/Study Activities Didactic training in grant development Instructor: Kevin Krull	
9.	Institutional and Committee Assignments Clinical Fellow's Counsel St. Jude Children's Research Hospital	2016 - 2017
10.	Formal Education/Teaching Activities Molly Litten St. Jude Summer Plus Fellow, Rhodes College Role: Mentor Current Position: Clinical Research Assistant, St. Jude Children's Research Ho	2018 - 2019 ospital
	Course Instructor, Suture Skills Lab (Graduate Level) Department of Surgery University of Tennessee Health Science Center	2002 - 2005
	Course Instructor, Clinical Skills Lab (Graduate Level) Department of Medicine University of Tennessee Health Science Center	2008 - 2009
11.	Grant Awards	
	A. Pending Grants	
	B. Completed Grants	
	T32 CA225590 Training in Pediatric Cancer Survivorship Outcomes and Interventions Role: Scholar (PI: Kevin Krull) Effort: 100%	04/01/2018 - 03/31/2020
	NIH Medical Student Research Fellowship Analysis of Patterns of Neuronal Activity During a Continuous Performance Award: \$3,500.00 Role: Scholar	e Task
	AHA Health Science Fellowship in Vascular Biology Feasibility of Using Arterial Spin Labeling Imaging in Children with Sickle C Award: \$4,500.00 Role: Scholar	cell Disease

Whitaker Foundation Grant, Joint Graduate Program in Biomedical Engineering Training in Functional Magnetic Resonance Imaging Acquisition and Analysis Role: Scholar (PI: Michael R. Neuman) Effort:100%

12. Clinical Trials Involvement

Transcranial Direct Current Stimulation of the Temporal Cortex in Survivors of Childhood ALL St. Jude Children's Research Hospital Role: Principal Investigator

Neurostimulation in Adult Survivors of Childhood Acute Lymphoblastic Leukemia St. Jude Children's Research Hospital Role: Co-Investigator

Safety, Feasibility and Preliminary Efficacy of Intranasal Oxytocin and Transcranial Direct Current Stimulation (tDCS) for Facial Affect Recognition in Survivors of Medulloblastoma St. Jude Children's Research Hospital Role: Co-Investigator

Neurocognitive Impairment in Childhood Pediatric Leukemia Survivors Related to Dexamethasone Exposure St. Jude Children's Research Hospital Role: Co-Investigator

13. Publication Record

A. Peer Reviewed Publications

i. Original Research Articles

- Ries ML, Boop FA, Griebel ML, Zou P, Phillips NS, Johnson SC, Williams JP, Helton KJ, Ogg RJ. Functional MRI and Wada determination of language lateralization: A case of crossed dominance. Epilepsia. 2004 Jan;45(1):85-89. PubMed PMID: 14692913.
- Phillips NS, Helton, KJ, Gajjar A, Boop FA, Sanford, RA, & Ogg RJ. Diffusion tensor imaging of intraaxial tumors at the cervicomedullary and pontomedullary junctions. Report of two cases. J Neurosurg. 2005 Dec;103(6 Suppl):557-62. PubMed PMID: 16383256. Role: First author
- Helton KJ, Phillips NS, Khan RB, Boop FA, Sanford RA, Zou P, Li CS, Langston JW, Ogg RJ. Diffusion tensor imaging of tract involvement in children with pontine tumors. AJNR Am J Neuroradiol. 2006 Apr;27(4):786-793. PubMed PMID: 16611765.
- 4. Helton KJ, Weeks JK, **Phillips NS**, Zou P, Kun LE, Khan RB, Gajjar A, Fouladi M, Broniscer A, Boop FA, Li CS, Ogg RJ. Diffusion tensor imaging of brainstem tumors: axonal degeneration of motor and sensory tracts. JNeurosurg Pediatr. 2008 Apr;1(4):270-276. PubMed PMID: 18377301.
- Morris EB, Phillips NS, Laningham FH, Patay Z, Gajjar A, Wallace D, Boop F, Sanford R, Ness KK, Ogg RJ. Proximal dentatothalamocortical tract involvement in posterior fossa syndrome. Brain. 2009 Nov;132(Pt 11):3087-95. PubMed PMID: 19805491.
- Barb SM, Rodriguez-Galindo C, Wilson MW, Phillips NS, Zou P, Scoggins MA, Li Y, Qaddoumi I, Helton JK, Bikhazi G, Haik G, Ogg RJ. Functional neuroimaging to characterize visual system development in children with retinoblastoma. Invest Ophthalmol Vis Sci. 2011 Apr 20;52(5):2619-26. PubMed PMID: 21245407.

- Harrigan RL, Yvernault BC, Boyd BD, Damon SM, Gibney KD, Conrad BN, Phillips NS, Rogers BP, Gao Y, Landman BA. Vanderbilt University Institute of Imaging Science Center for Computational Imaging XNAT: A multimodal data archive and processing environment. Neuroimage. 2016 Jan 1;124(Pt B):1097-1101. PubMed PMID: 25988229.
- Wang Z, Wilson CL, Easton J, Thrasher A, Mulder H, Liu Q, Hedges DJ, Wang S, Rusch MC, Edmonson MN, Levy S, Lanctot JQ, Caron E, Shelton K, Currie K, Lear M, Patel A, Rosencrance C, Shao Y, Vadodaria B, Yergeau D, Sapkota Y, Brooke RJ, Moon W, Rampersaud E, Ma X, Chang TC, Rice SV, Pepper C, Zhou X, Chen X, Chen W, Jones A, Boone B, Ehrhardt MJ, Krasin MJ, Howell RM, **Phillips NS**, Lewis C, Srivastava D, Pui CH, Kesserwan CA, Wu G, Nichols KE, Downing JR, Hudson MM, Yasui Y, Robison LL, Zhang J. Genetic risk for subsequent neoplasms among long-term survivors of childhood cancer. J Clin Oncol. 2018 Jul 10;36(20):2078-2087. PubMed PMID: 29847298.
- Kesler SR, Ogg RJ, Reddick WE, **Phillips NS**, Scoggins MA, Glass JO, Cheung YT, Pui CH, Robison LL, Hudson MM, Krull KR. Brain network connectivity and executive function in long-term survivors of childhood Acute Lymphoblastic Leukemia. Brain Connect. 2018 Aug;8(6):333-342. PubMed PMID: 29936880.
- Krull K, Li C, **Phillips NS**, Cheung YT, Brinkman T, Wilson C, Armstrong G, Khan R, Merchant T, Sabin N, Srivastava D, Pui CH, Robison L, Hudson M, Sklar C, Chemaitilly W. Growth hormone deficiency and neurocognitive function in adult survivors of childhood Acute Lymphoblastic Leukemia. Cancer. 2019 May 15;125(10):1748-1755. PubMed PMID: 30690723.
- Banerjee P, Rossi MG, Anghelescu DL, Liu W, Breazeale AM, Reddick WE, Glass JO, Phillips NS, Jacola LM, Sabin ND, Inaba H, Srivastava DK, Robison LL, Pui CH, Hudson MM, Krull KR. Association between anesthesia exposure and neurocognitive and neuroimaging outcomes in longterm survivors of childhood Acute Lymphoblastic Leukemia. JAMA Oncol. 2019 Jun 20;5(10). PubMed PMID: 31219514.
- Phillips NS, Hillenbrand CM, Mitrea BG, Yan J, Li C, Scoggins MA, Merchant TE, Armstrong GT, Srivastava DK, Pui CH, Robison LL, Hudson MM, Krull KR, Sabin ND. Cerebral microbleeds in adult survivors of childhood Acute Lymphoblastic Leukemia treated with cranial radiation. Sci Rep. 2020 Jan 20;10(1):692. PubMed PMID: 31959839. Role: First author
- Phillips NS, Howell CR, Lanctot JQ, Partin RE, Pui CH, Hudson MM, Robison LL, Krull KR, Ness KK. Physical fitness and neurocognitive outcomes in adult survivors of childhood Acute Lymphoblastic Leukemia: A report from the St. Jude Lifetime Cohort. Cancer. 2020 Feb 1;126(3):640-648. PubMed PMID: 31631333. Role: First author
- Phillips NS, Cheung YT, Glass JO, Scoggins MA, Lui W, Ogg RJ, Mulrooney DA, Pui CH, Robison LL, Reddick WE, Hudson MM, Krull KR. Neuroanatomical abnormalities related to dexamethasone exposure in survivors of childhood Acute Lymphoblastic Leukemia. Pediatr Blood Cancer. 2020 Mar;67(3):e27968. PubMed PMID: 31407461. Role: First author
- Phillips NS, Kesler, SR, Scoggins, MA, Glass, JO, Cheung, YT, Liu, W, Banerjee P, Ogg, RJ, Srivastava, D, Pui, CH, Robison, LL, Reddick, WE, Hudson, MH, & Krull, KR. Connectivity of the Cerebello-Thalamo-Cortical Pathway in Survivors of Childhood Leukemia Treated with Chemotherapy-Only. JAMA Netw Open, 2020 Nov, 3(11): e2025839. PMID: 33216140. Role: First author
- Varedi M, Lu L, Phillips NS, Partin R, Brinkman TM, Armstrong GT, Chase E, Khan RJ, Powell D, McKenna RF, Robison LL, Hudson MM, Ness KK. Balance impairment in survivors of pediatric brain tumors: risk factors and associated limitations. J Cancer Surviv., 2021 Apr; 15(2): 311-24. PMID: 32895869.
- Phillips NS, Duke ES, Schofield HL, Ullrich NJ. Neurotoxic effects of childhood cancer therapy and its potential neurocognitive impact. J Clin Oncol., 39(16): 1752-65, 2021. PMID:33886374 Role: First author

- Phillips NS, Khan RB, Li C, Mirzaei Salehabadi S, Brinkman TM, Srivastava DK, Robison LL, Hudson MM, Krull KR, Sadighi ZS. Seizure' impact on cognition and quality of life in childhood cancer survivors. Cancer. Epub September 1, 2021.
- 19. **Phillips NS**, Rao V, Kmetz L, Vela R, Medick S, Krull KR, Kesler SR. Changes in brain functional and effective connectivity after treatment for breast cancer and implications for intervention targets. Brain Connect. Epub September 3, 2021.

ii. Original Research Articles Submitted for Review

- 1. Phillips NS, Stratton KL, Williams AM, Lui W, Ahles T, Ness KK, Gibson TM, Banerjee P, Yasui Y, Oeffinger KC, Chow, EJ, Howell RM, Robison LL, Armstrong GT, Leisenring WM, Krull KR. Accelerated cognitive decline in adult survivors of pediatric central nervous system (CNS) tumors; A report from the childhood cancer survivor study (CCSS). Submitted for review.
- Williams, AM, Xing, M, Phillips, NS, Yasui, Y, Ehrhardt, MJ, Howell, R, Oeffinger, K, Gibson, T, Chow, EJ, Leisenring, W, Salehabadi, SM, Srivastava, D, Robison, LL, Armstrong, GT, Krull, KR. Risk Factors for Neurocognitive and Psychosocial Outcomes After Hodgkin Lymphoma: The Childhood Cancer Survivor Study. Submitted for review.

iii. Abstracts

- 1. Zou P, **Phillips N**, Ogg R. Retrospective event-related analysis of a block-designed fMRI CPT experiment. ISMRM Annual Meeting. Honolulu, HI. May 2002.
- 2. **Phillips NS**, Helton K, Sanford R, Gajjar A, Tekautz T, Zou P, Langston JW, Ogg R. Diffusion tensor imaging analysis of the growth pattern of an intraxial tumor at the cerviomedullary junction. ASNR Annual Meeting. Seattle, WA. June 2004. Role: First author. *Proc AJNR. 2004:462*.
- 3. Reddick WE, Glass JO, Jain JJ, **Phillips NS**, Ji Q, Ogg RJ, Merchant TE, Gajjar A. Evaluating the impact of cancer therapy on the developing brain. ISMRM Scientific Meeting & Exhibition. Seattle, WA. May 6-12, 2006. *ISMRM. 2006;316.*
- 4. Barb S, Rodriguez-Galindo C, **Phillips N**, Zou P, Wilson M, Haik B, Ogg R. Visual system development in children with retinoblastoma. Organization of Human Brain Mapping. Florence, Italian Republic. June 11-15, 2006. *Neuroimage.* 2006;13(1):1-242.
- Scoggins MA, Barb SM, Rodriguez-Galindo C, Wilson MW, Phillips NS, Zou P, Li Timei, Qaddoumi I, Helton KJ, Bikhazi G, Haik BG, Ogg RJ. Functional connectivity in children with retinoblastoma. Memphis BioImaging Symposium (MemBIS). Memphis, TN. November 2010.
- 6. **Phillips N**, Clarke D, Perkins FF, Ogg RJ, McMannis M. Bilateral asymmetries in the maximal activation of same subjects SSEP's. American Epilepsy Society Annual Meeting. Baltimore, MD. December 1-5, 2011. Role: First author. *Epilepsy Curr. 2011;11(1):211.*
- Phillips N, Choudrhi A, Wheless J, Shah N, Patay Z. Evidence of Morphologic Differences in Children with Down's syndrome Who Develop Infantile Spasms. American Epilepsy Society Annual Meeting. Washington, DC. December 5-9, 2013. Role: First author. *Epilepsy Curr. 2013; Jan-Feb;13(1):400.*
- Phillips NS, Howell C, Hudson MM, Robison LL, Krull KR, Ness KK. Associations between fitness and neurocognitive outcomes in adult survivors of Childhood Acute Lymphoblastic Leukemia in the St. Jude Lifetime Cohort Study. Abstract #PD-032, PD-607. SIOP Annual Meeting. Kyoto, Japan. November 16-19, 2018. Role: First author. *Pediatr Blood Cancer. 2018 Nov;65 Suppl 2(Suppl 2):e27455.*

- 9. Kesler SR, **Phillips NS**, Rao V, Kmetz L, Vela R, Medick S, Krull KR. Functional and effective connectivity of default mode network is disrupted in chemotherapy-treated patients with breast cancer. Cognitive Neuroscience Society Annual Meeting. May 2020.
- Rodwin RL, Lu L, Srivastava DK, Brinkman TM, Krull KR, Armstrong GT, Khan RB, Phillips NS, Merchant TE, Gajjar AJ, Robison LL, Hudson MM, Kadan-Lottick NS, Ness KK. Peripheral motor and sensory neuropathy in survivors of childhood central nervous system (CNS) tumors in the St. Jude Lifetime (SJLIFE) cohort. Abstract # 10549. 2020 ASCO Virtual Scientific Program. May 29-31, 2020.JCO 2020 May; 85(15):10549-10549
- Scoggins M, Zou P, McAfee S, Phillips N, Li Y, Patay Z, Gajjar A, Conklin H. A longitudinal study of neural networks for reading in patients with medulloblastoma. Abstract #3411 2020 OHBM Virtual Scientific Program. June 23 – July 3, 2020.
- 12. Banerjee P, Liu W, Ehrhardt MJ, Williams AM, **Phillips NS**, Brinkman TM, Bhakta N, Huang IC, Khan R, Armstrong GT, Srivastava D, Robison LL, Hudson MM, Krull KR. Neurocognitive phenotypes in long-term survivors of childhood cancer: A report from the St. Jude Lifetime Cohort Study. International Neuropsychological Society, Paper presentation, February 2021.
- Phillips N, Stratton KL, Williams AM, Lui W, Ahles T, Ness KK, Gibson TM, Banerjee P, Yasui Y, Oeffinger KC, Chow, EJ, Howell RM, Robison LL, Armstrong GT, Leisenring WM, Krull KR. Accelerated cognitive decline in adult survivors of pediatric central nervous system (CNS) tumors; A report from the childhood cancer survivor study (CCSS). Abstract #10049 2021 ASCO Virtual Meeting. June 2021.

14. Presentations

a. Oral Presentations

- 1. Helton KJ, Ogg R, **Phillips NS**. Diffusion tensor imaging analysis of tract involvement of Diffuse Brainstem Gliomas in children, with neurological correlation. Southeastern Neuroradiological Society Annual Meeting. Amelia Island, FL. October 2003. *Best Paper Award presentation*
- 2. Reis M, Boop F, Zou P, **Phillips N**, Johnson S, Ogg R. fMRI and WADA testing for language lateralization: A case of crossed dominance. INS Annual Meeting. 2003.
- 3. **Phillips N**, Helton KJ, Sanford RA, Gajjar A, Tekavtz T, Boop FA, Zou P, Langston JW, Ogg R. Diffusion tensor imaging analysis of the growth pattern of an intra-axial tumor at the cervicomedullary junction. North American Skull Base Society Annual Meeting. New Orleans, LA. February 2004. Role: Speaker, first author
- 4. Helton KJ, **Phillips N**, Khan RB, Boop FA, Sanford A, Ogg R. Diffusion tensor imaging in Pediatric Brainstem Glioma (BSG) patients, with neurologic correlation. ASNR Annual Meeting. Seattle, WA. June 7-11, 2004. *Proc AJNR. 2004:7.*
- Helton KJ, Phillips N, Khan RB, Boop FA, Zou P, Langston J, Ogg R. Diffusion tensor imaging analysis of tract involvement of diffuse brainstem gliomas in children, with neurological correlation. Radiological Society of North America 90th Scientific Assembly and Annual Meeting. November 28-December 2004. Plenary presentation.
- Zou P, Phillips N, Zhang Y, Mulhern RK, Merchant TE, Gajjar A, Ogg RJ. BOLD response in pediatric brain tumor patients during treatment. ISMRM Scientific Meeting & Exhibition. Miami Beach, FL. May 2005.
- 7. Helton KJ, Weeks J, **Phillips N**, Zou P, Li C, Kun L, Khan R, Gajjar A, Ogg RJ. Tractography in pediatric brain stem glioma patients: Wallerian degeneration of coriticospinal and sensory pathways. ASNR Annual Meeting. Toronto, Canada. May 2005.

- 8. Morris B, Jacobs-Levin A, **Phillips N**. Postoperative mutism in children with infratentorial tumors. St. Jude Children's Research Hospital. Cure4Kids Seminar. Memphis, TN. 2007. Role: Speaker
- Phillips NS, Glass JO, Scoggins M, Cheung YT, Liu W, Ogg RJ, Mulrooney D, Pui CH, Robison LL, Reddick WE, Hudson MM, Krull KR. Subcortical brain volumes and neurocognitive function in survivors of childhood acute lymphoblastic leukemia treated with chemotherapy-only. (a) ASCO Annual Meeting. June 2-6, 2017. Role: Speaker, first author. (b) 15th International Conference on Long-Term Complications of Treatment of Children and Adolescents for Cancer. Atlanta, GA. June 2017. Role: Speaker, first author
- Banerjee P, Rossi MG, Anghelescu DL, Mayhew AA, Reger K, Phillips NS, Reddick WE, Glass JO, Jacola LM, Robison LL, Pui CH, Hudson MM, Krull KR. Anesthesia exposure, neurocognitive function, and neuroimaging outcomes in long-term survivors of childhood acute lymphoblastic leukemia. INS Annual Meeting. Washington, DC. February 2018. Paper presentation.
- 11. Banerjee P, Rossi MG, Anghelescu DL, Liu W, Mayhew A, Reger K, Srivastava D, Phillips N, Reddick WE, Glass JO, Jacola LM, Robison LL, Pui CH, Hudson MM, Krull KR. Neurocognitive and neuroimaging outcomes of anesthesia exposure in long-term survivors of childhood acute lymphoblastic leukemia. ICCTF Cognition and Cancer Biennial Conference. Sydney, Commonwealth of Australia. April 2018.
- 12. **Phillips NS,** Glass JO, Banerjee P, Scoggins M, Cheung YT, Ogg RJ, Pui CH, Hudson MM, Robison LL, Krull KR. Cerebellar volumes and neurocognitive outcomes in survivors of childhood acute lymphoblastic leukemia treated with chemotherapy alone. ICCTF Cognition and Cancer Biennial Conference. Sydney, Commonwealth of Australia. April 2018. Role: Speaker, first author
- Phillips NS, Howell CR, Pui CH, Hudson MM, Robison LL, Krull KR, Ness KK. Associations between fitness and neurocognitive outcomes in adult survivors of childhood Acute Lymphoblastic Leukemia: A St. Jude Lifetime Cohort Study. SIOP Annual Meeting. Kyoto, Japan. October 2019. Role: Presenter, first author.
- 14. Banerjee P, Liu W, Ehrhardt MJ, Williams AM, **Phillips NS**, Brinkman TM, Bhakta N, Huang IC, Khan R, Armstrong GT, Srivastava D, Robison LL, Hudson MM, Krull KR. Phenotypes of neurocognitive impairment in long-term survivors of childhood cancer: A report from the St. Jude Lifetime Cohort Study. International Society of Paediatric Oncology, Paper presentation, October 2020.
- 15. Williams, AM, Xing, M, Phillips, NS, Yasui, Y, Ehrhardt, MJ, Howell, R, Oeffinger, K, Gibson, T, Chow, EJ, Leisenring, W, Salehabadi, SM, Srivastava, D, Robison, LL, Armstrong, GT, Krull, KR. Prevalence and Predictors of Neurocognitive Impairment in Long-Term Survivors of Childhood Hodgkin Lymphoma: A Report from the Childhood Cancer Survivor Study. American Society of Hematology. December 2020.
- 16. Williams AM, Xing M, Phillips N, Yasui Y, Ehrhardt M, Howell R, Oeffinger K, Gibson T, Chow EJ, Leisenring W, Salehabadi SM, Srivastava D, Robison L, Armstrong GT, Krull KR. Prevalence and Predictors of Neurocognitive Impairment in Long-Term Survivors of Childhood Hodgkin Lymphoma: a Report from the Childhood Cancer Survivor Study. 2021 Childhood Cancer Survivor Study Investigator's Meeting.
- 17. Gandy K, Scoggins MA, **Phillips NS**, Jacola LM, Pui CH, Hudson MM, Reddick WE, Krull KR. Functional brain activity associated with working memory in long-term survivors of pediatric acute lymphoblastic leukemia: sex-based differences. International Society of Paediatric Oncology, Paper presentation, October 2021.