



Optimising vascular access for patients receiving intravenous systemic therapy for early breast cancer – A survey of oncology nurses and physicians

LeVasseur N¹, Stober C², Daigle K³, Robinson A⁴, McDiarmid S³, Mazzarello S², Hutton B⁵, Joy A⁶, Fergusson D⁵, Hilton J^{1,2}, McInnes M⁷, Clemons M^{1,2,5}

Perceptions around vascular access for intravenous systemic therapy and risk factors for lymphedema in early stage breast cancer – A patient survey

LeVasseur N¹, Stober C², Ibrahim M³, Gertler S¹, Hilton J^{1,2}, Robinson A⁴, McDiarmid S³, Fergusson D^{2,5}, Mazzarello S², Hutton B⁵, Joy A⁶, McInnes M⁷, Clemons M^{1,2,5}

¹ Division of Medical Oncology and Department of Medicine, Ottawa Hospital and University of Ottawa, Ottawa, Canada ² Ottawa Hospital Research Institute, Ottawa, Canada

³ Department of Nursing, Ottawa Hospital, Ottawa, Canada ⁴ Division of Medical Oncology, Cancer Centre of Southeastern Ontario, Kingston, Canada ⁵ Clinical Epidemiology Program, Ottawa Hospital Research Institute, Ottawa, Canada ⁶ Department of Oncology, Division of Medical Oncology, University of Alberta, Cross Institute, Edmonton, Canada

⁷ Department of Radiology, Ottawa Hospital, Ottawa, Canada

BACKGROUND

- Despite changes in the nature (i.e. less anthracycline use) and duration (e.g. trastuzumab administration every three weeks for one year) of systemic therapy for patients with early stage breast cancer, optimal practices for intravenous (IV) access remain unknown^{1,2}.
- Choosing peripheral intravenous access versus central venous access devices (CVAD) such as PICCs/PORTs remains an area of clinical equipoise and patient preferences are not consistently acknowledged.
- Each of these administration routes has its own merits and complications that need to be weighed considering each individual patient and their systemic regimen.
- Given the uncertainty amongst experts within the oncology community as to best practices³, a survey targeted towards oncology patients, nurses and physicians was administered to evaluate how medical professionals decide on venous access methods.
- A patient survey was also performed to evaluate patient experience with vascular access during treatment for early stage breast cancer and to explore perceived risk factors for lymphedema.

METHODS

- A survey of patients, oncology nurses responsible for the care of breast cancer patients and medical oncologists was conducted at 2 cancer centers.
- Recruitment for both surveys ran between March 2016 and June 2016.
- Information sheets were handed out to interested patients by a member of their care team inviting them to complete the survey if interested.
- Information sheets were handed out to interested nurses by their nurse managers who then contacted the research team if they were interested in participating. A modified Dillman technique was used for the electronic physician survey.

PATIENT RESULTS

Table 1. Respondent characteristics

	Total Responses	Responses based on access type		
		PIV (%)	PICC (%)	PORT (%)
Mean age (range)	55 (23-90)			
Chemo regimen (n=151)				
TC	42 (28%)	22/36 (61%)	4/36 (11%)	10/36 (28%)
FEC-D	53 (35%)	6/53 (11%)	28/53 (53%)	19/53 (36%)
AC-paclitaxel	37 (25%)	3/36 (8%)	23/36 (64%)	10/36 (28%)
AC-Taxotere	8 (3%)	2/8 (25%)	3/8 (38%)	3/8 (38%)
Other	16 (10%)			
No response	36 (19%)			
Trastuzumab (n=173)				
Yes	64 (37%)	8/64 (13%)	7/64 (11%)	49/64 (77%)
No	82 (47%)	27/82 (33%)	50/82 (61%)	6/82 (7%)
Unsure	28 (16%)			
No response	14 (7%)			
Vascular access (n=183)				
PIV	44 (24%)			
PICC	77 (42%)			
PORT	62 (34%)			
No response provided	4 (2%)			

Figure 1. Factors influencing patient choices for intravenous access

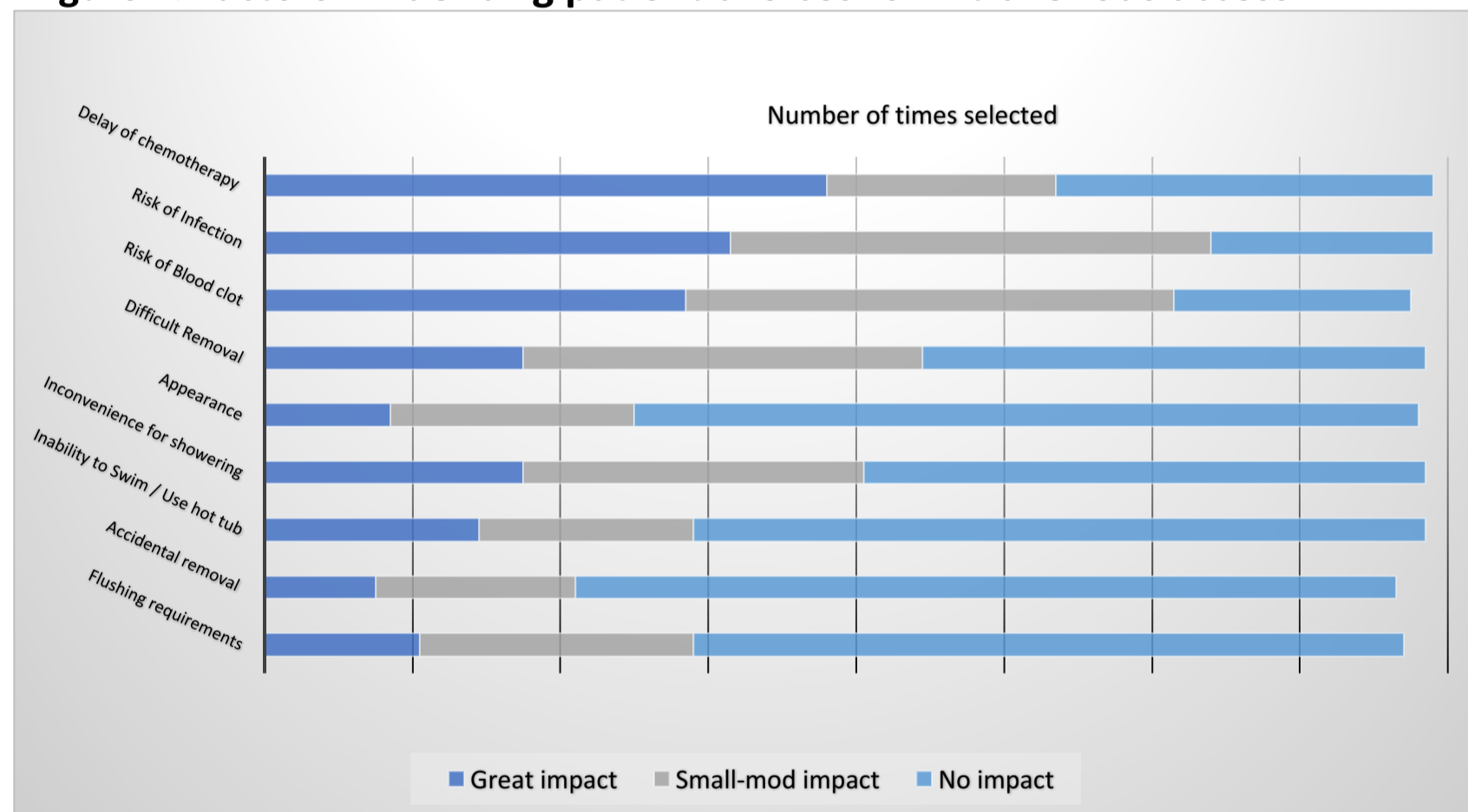


Table 2. Patient reported rates of complications based on type of vascular access

	Peripheral IV		PICC		PORT	
	# times selected	%	# times selected	%	# times selected	%
Totals respondents (n=183)	44	24	77	42	62	34
Delay in starting chemotherapy while waiting for line insertion	2	5	4	5	2	3
Chemotherapy leaking under the skin	9	20	0	0	0	0
IV not working	4	9	0	0	0	0
Infection in the skin	0	0	7	9	3	5
Blood clot requiring anticoagulation	0	0	3	4	4	6
Line being pulled out accidentally	1	2	7	9	0	0
Difficult removal of the line after chemotherapy completion	0	0	4	5	2	3

DISCUSSION

- The administration of trastuzumab and/or anthracyclines was associated with a higher likelihood of patients receiving a CVAD.
- Other factors associated with the recommendation of a CVAD included prior difficult IV access and recommendations from the chemotherapy nurse.
- While few patients (7%) reported being involved in the decisions regarding vascular access, most were satisfied (88%) with their access device. Patient preference mainly centered on avoiding delays in initiation of chemotherapy.
- Although the perceived rates of complications associated with the use of PICCs and PORTs remained high, respondents felt that CVADs may improve QoL.
- Reported risk factors associated with the risk of lymphedema were: axillary lymph node dissection, radiation to the axilla and line-associated infections. Factors known to be unrelated to lymphedema risk continue to be perpetuated.

NURSES AND PHYSICIAN RESULTS

Table 1. Respondent characteristics

	Number	Percentage (%)
Physicians (N=25)		
Province		
Ontario	25	100
Centre		
Academic	20	80
Community	4	16
Other	1	4
Chemo initiation	25	100
	Number (range)	
New breast patients / mo	22 (6-65)	N/A
Nurses (n=57)		
Province		
Ontario	57	100
Role*		
Chemotherapy nurse	31	54
Oncology clinic nurse	20	35
Oncology ward nurse	10	18
	Number (range)	
Years of experience	9 (2-28)	N/A
Breast patients / week	22 (1-28)	N/A

* Four respondents reported more than one nursing role

Figure 1. Physician Reported Factors Influencing Venous Access Method Choice

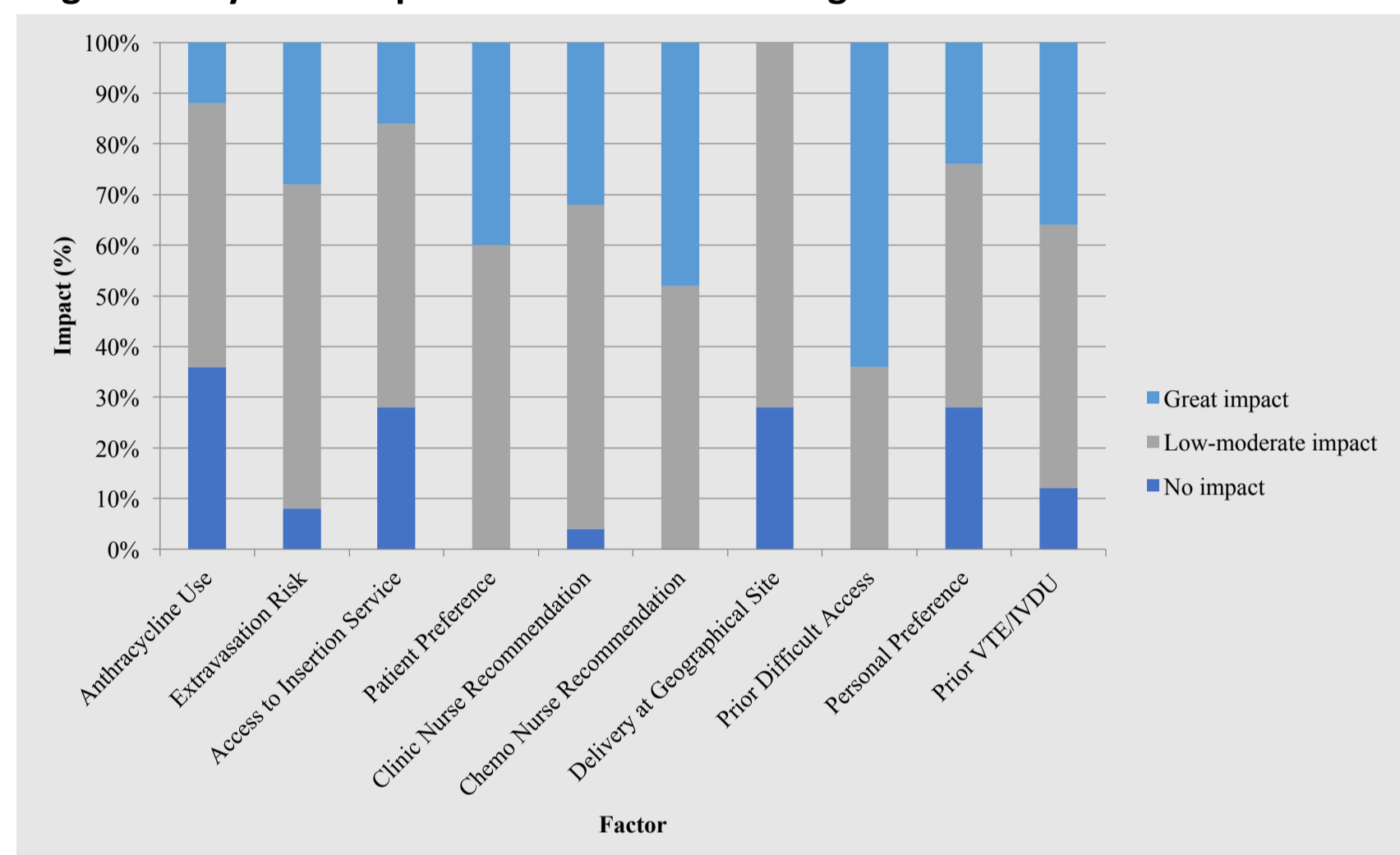
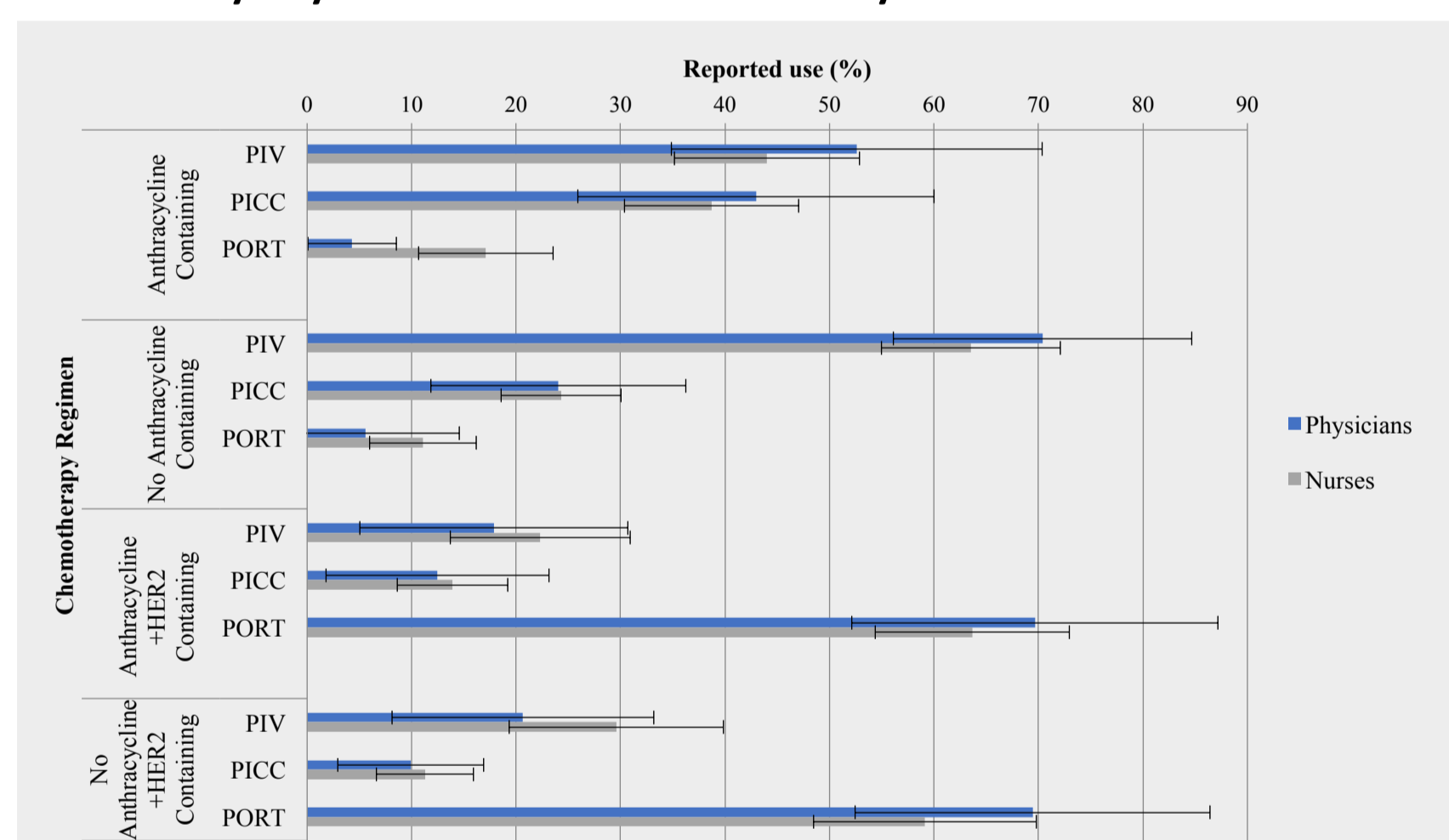
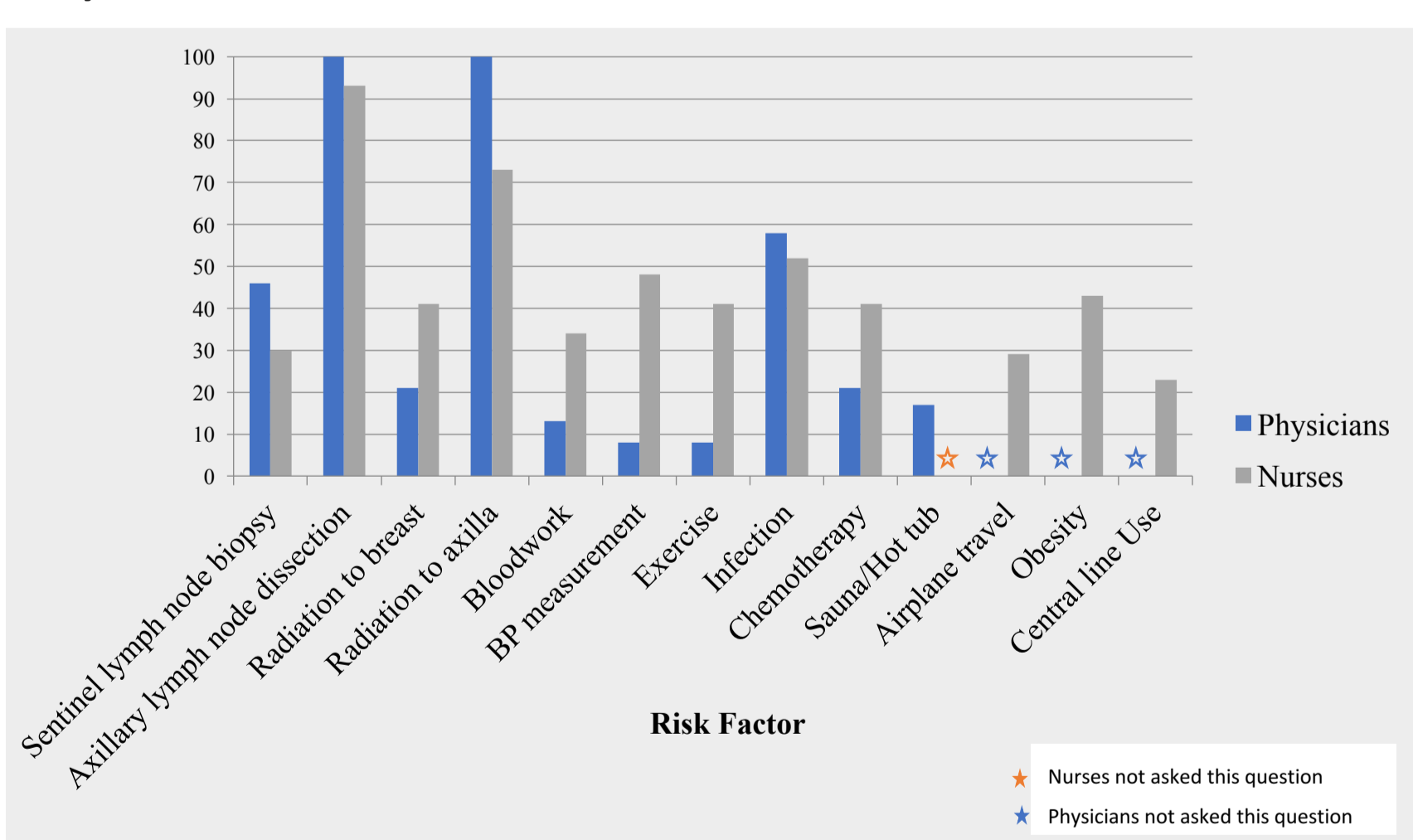


Figure 2. Impact of Chemotherapy Regimen on Method of Vascular Access Selected by Physicians and Rates Observed by Nurses



Abbreviations: PIV, peripheral intravenous; PICC, peripherally inserted central catheter; PORT, surgically implanted central catheter

Figure 3. Perceived Risk Factors Associated with Lymphedema by Physicians and Nurses



CONCLUSIONS

- Despite widespread use of chemotherapy for patients with breast cancer, significant variability exists for the type of venous access used.
- CVADs are most often recommended for patients receiving anthracycline, trastuzumab or those with a history of difficult IV access.
- Patients are not often involved in the decision making process for venous access.
- Perceptions regarding the risks of using CVADs and the risk of developing lymphedema vary widely amongst medical practitioners.

REFERENCES

(1) Freytes CO. Indications and complications of intravenous devices for chemotherapy. *Curr Opin Oncol* 2000 Jul;12(4):303-307.
 (2) Chopra V, Flanders SA, Saint S, Woller SC, O'Grady NP, Safdar N, et al. The Michigan Appropriateness Guide for Intravenous Catheters (MAGIC): Results From a Multispecialty Panel Using the RAND/UCLA Appropriateness Method. *Ann Intern Med* 2015;163(6 Suppl):S1-40.
 (3) Alexander M, Corrigan A, Gorski L, Hankins J, Perucca R editors. *Infusion Nursing: An Evidence Based Approach*. 3rd Edition ed.; 2010.