

A Time-and-Motion Study of Chemotherapy Administration in Metastatic Breast Cancer

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Background

- Breast cancer affects more than 250,000 women in the United States. Metastatic breast cancer (mBC) affects 6% of women and median survival is low (18-24 months).¹
- Intravenous (IV) chemotherapies for mBC include eribulin, vinorelbine, gemcitabine, and differ in their duration of administration, which can impact resource use and patient satisfaction.
- In a time-and-motion study, observers follow clinicians and record the duration of specific routine tasks (e.g., communicating with a patient, ordering therapy, administering therapy).
- Previous studies have investigated resource utilization and patient time associated with administration of IV chemotherapy in mBC treatment.
- However real-world data on IV therapy administration of eribulin in a clinical setting is limited.

Objective

- We conducted a time-and-motion study to quantify the time associated with the administration of eribulin, vinorelbine, or gemcitabine in patients with mBC.
 - Patient satisfaction was also assessed.

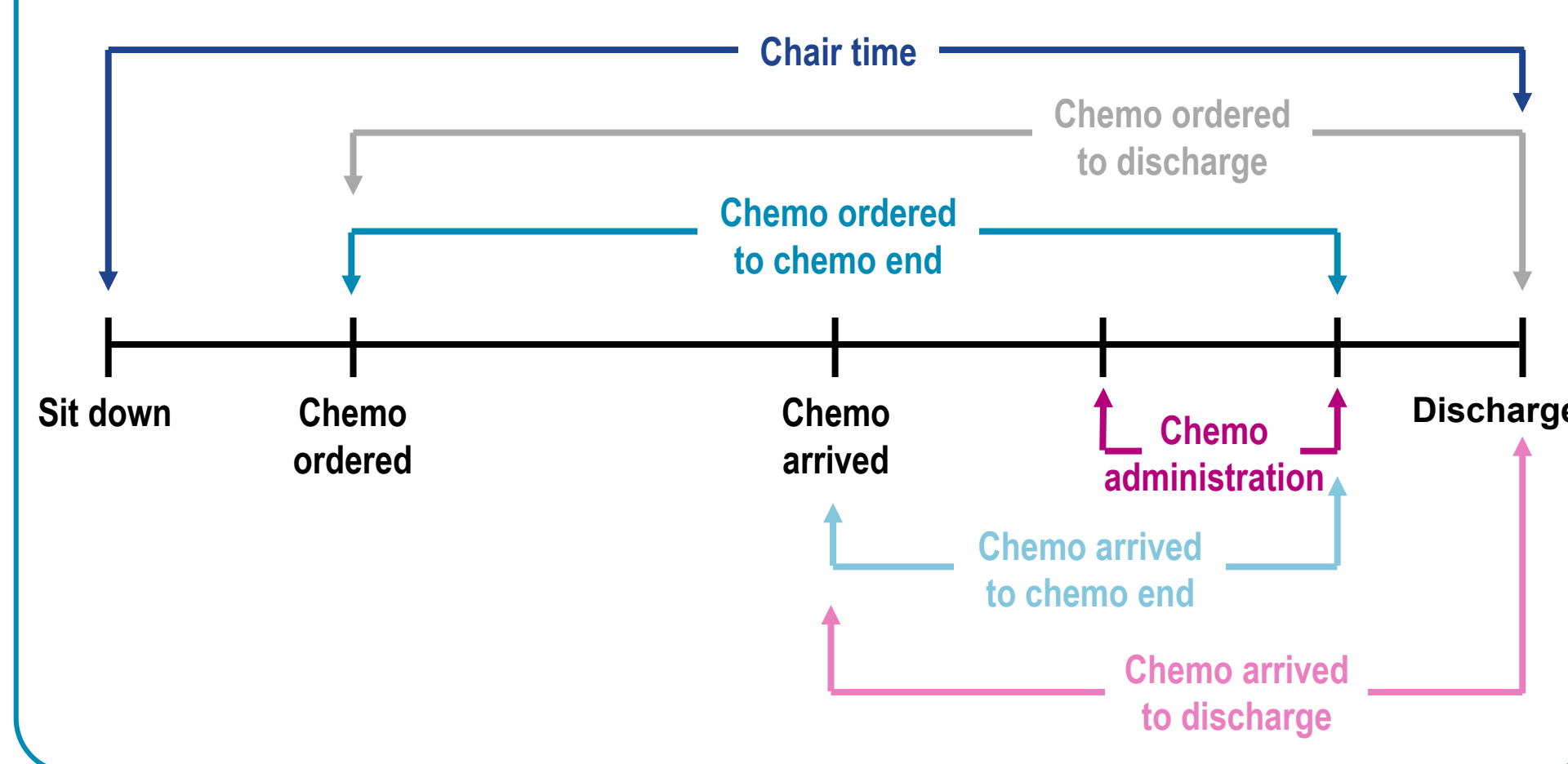
Methods

Study Design

- This is a prospective, observational time-and-motion study of adult females with mBC receiving $\geq 2^{\text{nd}}$ line eribulin, vinorelbine, or gemcitabine monotherapy at a large community oncology clinic.
- An observer documented the time routine clinical events occurred during patient's chemotherapy session.
- Patients completed a satisfaction survey adapted from the Agency for Healthcare Research and Quality's cancer care survey² and the Cancer Therapy Satisfaction Questionnaire.³
 - Included 4 questions to assess patient satisfaction on a 1 (very dissatisfied) to 5 (very satisfied) Likert scale.
- Collected patient-level demographic and clinical data from medical charts.
- Each patient could have up to 2 observations and completed the survey once.
- Data collection is ongoing. Interim analyses are presented here.

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Figure 1. Time Periods Related to Chemotherapy Administration in mBC Patients



Definition of Time Periods

- Six time periods were defined (Figure 1):
 - Chair time:** Patient sits in the infusion chair to patient discharge.
 - Chemo ordered to discharge:** Nurse orders chemotherapy from pharmacy to patient discharge.
 - Chemo ordered to chemo end:** Nurse orders chemotherapy from pharmacy to nurse ends chemotherapy administration.
 - Chemo administration:** Nurse starts to ends chemotherapy administration.
 - Chemo arrived to chemo end:** Chemotherapy arrives at patient chair to nurse ends chemotherapy administration.
 - Chemo arrived to discharge:** Chemotherapy arrives at patient chair to patient discharge.

Analyses

- Average time associated with each time period (listed above) for eribulin vs. vinorelbine/gemcitabine administration were compared using t-test.
- Percent satisfaction for each survey question was calculated; no responses were missing.
- Spearman's rank correlation was used to test correlations between time and patient satisfaction.

References

- Cancer of the Breast (Female) - SEER Stat Fact Sheets. 2016. Available from: <https://seer.cancer.gov/statfacts/html/breast.html>
- CAHPS Cancer Care Survey. Available from: <https://www.ahrq.gov/cahps/surveys-guidance/cancer/index.html>
- Abetz L et al. Value Health. 2005 Nov-Dec;8 Suppl 1:S41-53.

Results

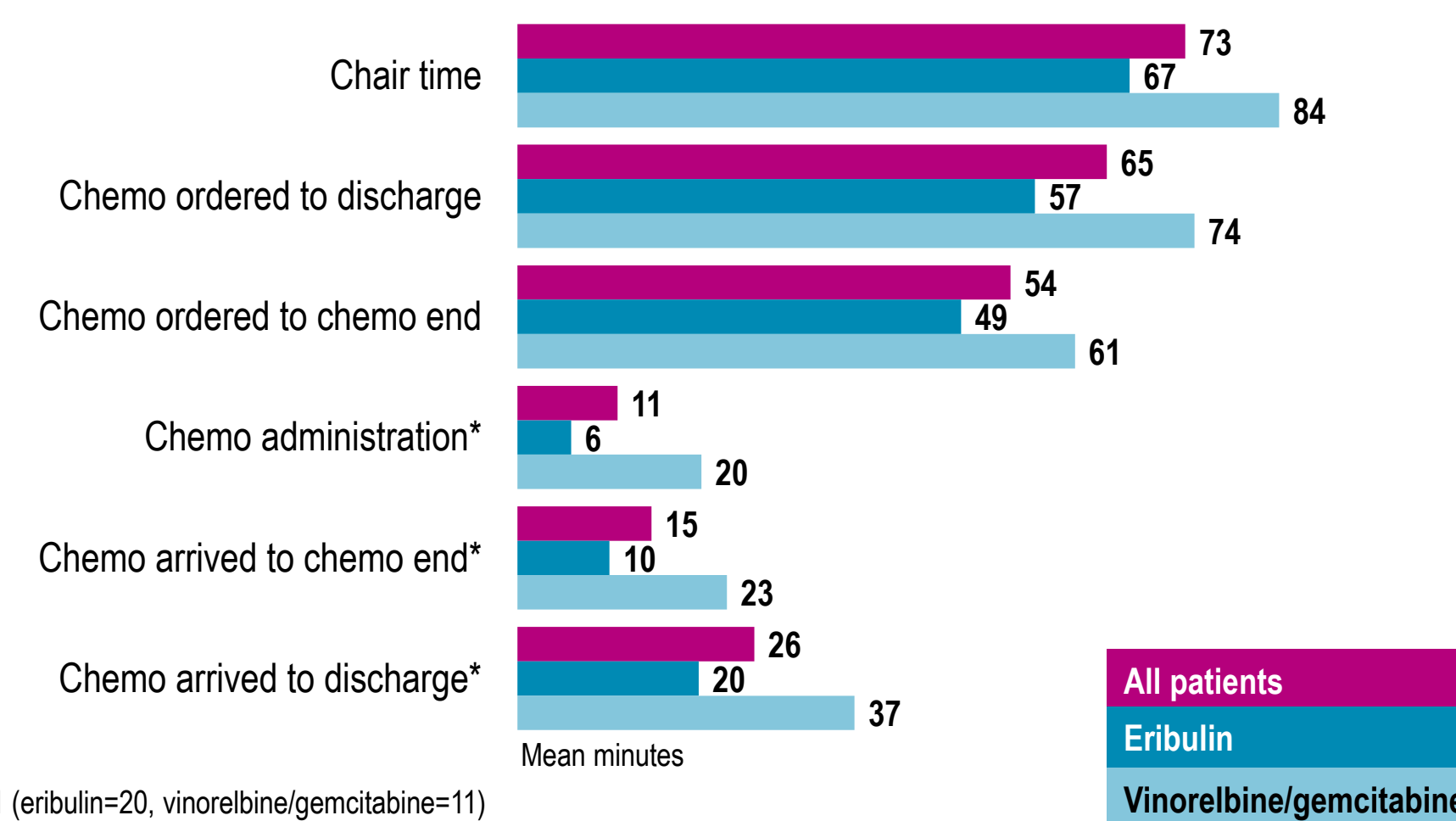
- 17 patients comprising 31 observations (20 eribulin, 11 vinorelbine/gemcitabine) were included (Table 1).
 - Patients were 65 years on average, 71% white, and 94% postmenopausal.
 - All were HER-2 negative.
 - Average duration (in years) since mBC diagnosis was lower for eribulin than vinorelbine/gemcitabine patients (1.7 vs. 5.0, $p < 0.009$).
- Patients were in the infusion chair for 73 minutes on average (Figure 2). Much of this time was waiting for chemotherapy to be brought to the patient chair after it had been ordered from pharmacy (mean 39 mins).

Table 1. Patient Demographics and Clinical Characteristics

	All patients	Eribulin	Vinorelbine/ Gemcitabine
Number of patients	17	11	6
Number of observations	31	20	11
Age (in years, mean)	65.3	62.1	71.2
Race (% white)	70.6	72.7	66.7
Postmenopausal (% yes)	94.1	90.9	100.0
Years since diagnosis of mBC (mean, (SD))*	2.9 (2.6)	1.7 (2.0)	5.0 (2.4)
Hormone receptor status (%)			
ER positive / PR positive / HER-2 negative	35.3	27.3	50.0
ER positive / PR negative / HER-2 negative	29.4	27.3	33.3
ER negative / PR positive / HER-2 negative	5.9	9.1	0
ER negative / PR negative / HER-2 negative	29.4	36.4	16.7

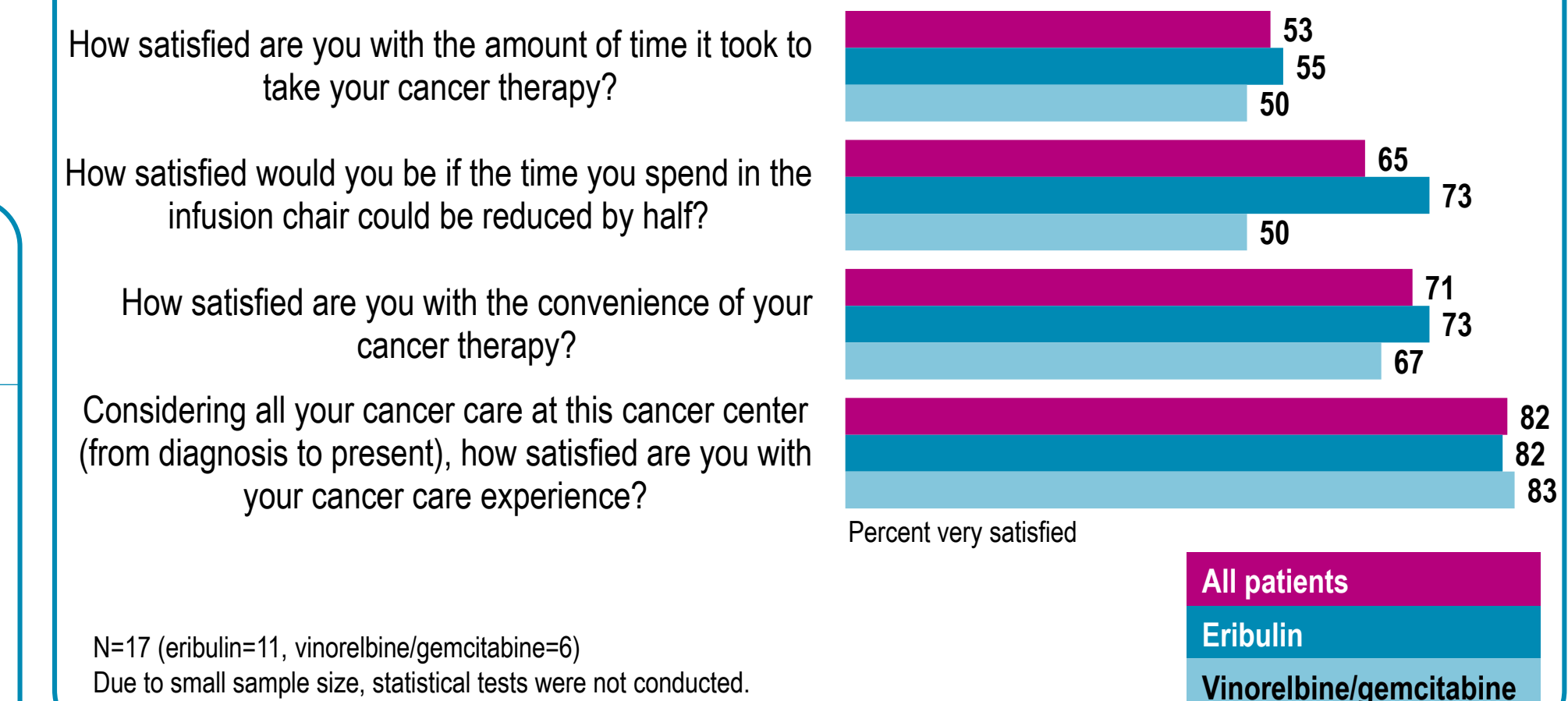
* $p < 0.05$

Figure 2. Average Time Associated with Each Time Period (Mean Minutes)



- Administration of eribulin was significantly shorter than vinorelbine/gemcitabine (Figure 2, 6 vs. 20 mins, $p = 0.001$).
- 82% of patients were very satisfied with their cancer care experience (Figure 3).
 - Satisfaction did not correlate with event times.

Figure 3. Percent of Respondents Very Satisfied with Cancer Care



Limitations

- Patients enrolled may not be representative of all mBC patients. A convenience sample of patients was prospectively enrolled from one clinic.
- All patients included in this study were HER-2 negative and more were receiving eribulin than vinorelbine/gemcitabine.
- Recording of timings during observations is subject to human error.
- Small sample size limits generalizability of results.

Conclusions

- Administration time for eribulin was significantly shorter than vinorelbine/gemcitabine.
- Patient satisfaction was high across all groups.
- These preliminary results demonstrate eribulin can shorten treatment administration time in mBC while maintaining patient satisfaction and providing patient-centered, coordinated care.