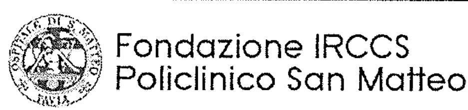
ALL. 5 A

Sistema Socio Sanitario



Regione
Lombardia

P-20200023486

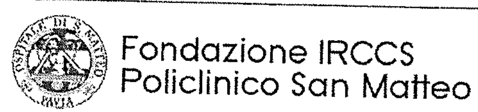
Prova estratta

Concorso Pubblico per l'assunzione a tempo indeterminato di n. 1 unità nel profilo di "Dirigente Medico - disciplina di Oncologia"

Prova scritta n. 1

Mesotelioma Maligno: Presentazione, percorso diagnostico e terapia

ALL. 5 B



Sistema Socio Sanitario

Regione Lombardia

P-20200023486

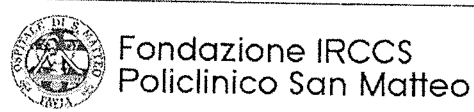
Concorso Pubblico per l'assunzione a tempo indeterminato di n. 1 unità nel profilo di "Dirigente Medico - disciplina di Oncologia"

Prova scritta n. 2

Inquadramento generale dei tumori del distretto cervico-cefalico virus correlati

Prova non estratta

All. 5C



P-20200023486

Concorso Pubblico per l'assunzione a tempo indeterminato di n. 1 unità nel profilo di "Dirigente Medico - disciplina di Oncologia"

Prova scritta n. 3

Tumori della giunzione esofago-gastrica

Prova non estratta

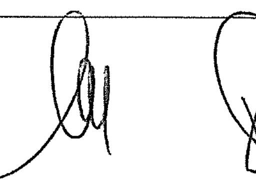
ALL. 13

P-20200023486

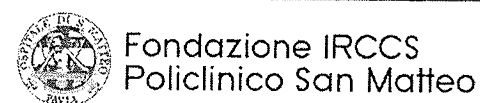
Concorso Pubblico per l'assunzione a tempo indeterminato di n. 1 unità nel profilo di "Dirigente Medico - disciplina di Oncologia"

Prova orale del 05/08/2021

1. Concetto di cure simultanee
2. Terapia dell'adenocarcinoma del pancreas localmente avanzato
3. Criteri di scelta terapeutica nel tumore della mammella metastatico
4. Indicazioni cliniche dei PARP Inibitori
5. Sindrome di Lynch
6. Gestione del soggetto sano portatore di mutazioni di BRCA1 e 2
7. Tumori solidi primitivi del mediastino
8. Terapia adiuvante del tumore del colon
9. Profilassi e terapia dell'emesi da chemioterapia
10. Terapia adiuvante del carcinoma dell'ovaio
11. TERAPIA DELL'ADENOCARCINOMA DEL POLMONE ALK MUTATO
12. Studi di fase I in oncologia
13. Terapia del carcinoma prostatico resistente alla castrazione
14. Farmaci a bersaglio molecolare nel carcinoma gastrico
15. Inquadramento dell'anemia del paziente oncologico
16. Profilassi primaria e secondaria della neutropenia febbrile
17. Approccio multidisciplinare del ca squamoso del distretto cervico-cefalico localmente avanzato



A ll. 13



P-20200023486

Concorso Pubblico per l'assunzione a tempo indeterminato di n. 1 unità nel profilo di "Dirigente Medico - disciplina di Oncologia"

18. Terapia adiuvante del melanoma
19. Terapia medica di prima linea nel carcinoma renale a cellule chiare M+
20. Terapia adiuvante dei sarcomi dei tessuti molli
21. Terapia adiuvante dei tumori germinali del testicolo
22. Terapia adiuvante del tumore del colon stadio B
23. Diagnosi e stadiazione del tumore del polmone
24. Follow-up del tumore del colon operato
25. Diagnosi e trattamento dei GIST
26. Conseguenze della malnutrizione nel paziente oncologico
27. Ipercalcemia maligna
28. Problematiche cardiologiche dei farmaci anti HER2
29. Criteri di scelta della terapia adiuvante del tumore della mammella
30. Applicazioni cliniche dei checkpoint inhibitors

Elenco domande di Informatica

1. **A COSA SERVE UN "UPS", DETTO ANCHE "GRUPPO DI CONTINUITA'"?** E' utile per mantenere costantemente alimentato elettricamente e in corrente alternata il computer
2. **A QUANTO CORRISPONDE UN KILOBYTE?** Circa 1000 byte
3. **CHE COSA E' LA FIRMA DIGITALE?** Un metodo di autenticazione personale di documenti elettronici
4. **CHE COSA E' LO "SCANDISK"?** Un processo di controllo del disco fisso
5. **CHE COSA PUO' CONTENERE UNA DIRECTORY?** File e sub-directory
6. **CHE COS'E' L'HTML?** Il linguaggio che caratterizza le pagine web
7. **CHE TIPO DI COMPUTER E' IL NOTEBOOK?** Portatile
8. **CHE TIPO DI FILE HA COME ESTENSIONE "*.JPG":** Un file immagine
9. **CHE TIPO DI FILE HA COME ESTENSIONE ".EXE":** Un file eseguibile
10. **COME E' POSSIBILE SPOSTARE UN FILE CONTENUTO IN UNA CARTELLA DEL DISCO FISSO IN UN' ALTRA CARTELLA?** Trascinando l'icona del file sull'icona della cartella di destinazione
11. **COMPRIMERE UN FILE SIGNIFICA:** Ridurre la dimensione del file
12. **COSA ACCADE SE VIENE FORMATTATO UN DISCO CONTENENTE DEI DATI?** I dati vengono perduti
13. **COSA E' IL "TIME OUT"?** Un evento che si verifica quando un apparato di rete non riceve la risposta che aspetta da un altro apparato di rete, entro un tempo predefinito
14. **COSA E' L'"E-MAIL"?** Un servizio internet grazie al quale è possibile inviare o ricevere messaggi
15. **COSA E' L'"IP ADDRESS"?** Un indirizzo IP identifica univocamente uno specifico computer
16. **COSA E' LO "SPAM"?** Un messaggio non richiesto
17. **COSA E' UN "INTERNET-BROWSER"?** Un programma Client per navigare in Internet
18. **COSA E' UN "LINK"?** Un collegamento ipertestuale
19. **COSA E' UN "SERVER"?** Una componente informatica che fornisce servizi ad altre componenti attraverso una rete
20. **COSA E' UN "TROJAN HORSE"?** Un programma che nasconde il suo vero scopo
21. **COSA SI INTENDE CON IL TERMINE JAVA?** Un linguaggio di programmazione
22. **COSA SI INTENDE CON IL TERMINE LOGIN?** Procedura di ingresso
23. **COSA SIGNIFICA LA SIGLA "FTP"?** File Transfer Protocol
24. **COSA SONO LE "FAQ"?** Sono raccolte di risposte a domande che vengono poste spesso affrontando un argomento
25. **E' POSSIBILE COPIARE I FILE CONTENUTI IN UN CD-ROM SU UN HARD DISK?** Sì, sempre
26. **E' POSSIBILE COPIARE I FILE CONTENUTI IN UNA PEN DRIVE SU UN CD-ROM?** Sì, se il computer è provvisto di masterizzatore
27. **E' POSSIBILE EFFETTUARE DELLE STAMPE DAL PROPRIO PC SU UNA STAMPANTE COLLEGATA AD UN ALTRO PC?** Sì, ma i due PC devono far parte della stessa rete e la stampante deve essere condivisa
28. **IL COPYRIGHT SUL SOFTWARE INDICA:** Una protezione legale della proprietà del software
29. **IL LETTORE CD-ROM VIENE UTILIZZATO PER:** La lettura di dati da dischi ottici
30. **COSA E' LINGUAGGIO HTML E':** Usato per descrivere i documenti ipertestuali disponibili nel Web
31. **IL MASTERIZZATORE E' UNA APPARECCHIO UTILIZZATO PER:** La lettura e scrittura dei dati su e da un disco ottico
32. **COSA E' IL MODEM:** Permette la modulazione e la demodulazione di segnali contenenti informazioni
33. **COSA E' IL MOUSE:** Un'unità periferica di immissione dei dati
34. **IL SOFTWARE FREEWARE:** Può essere utilizzato liberamente
35. **IL TASTO "CANC":** Cancella il carattere a destra del cursore
36. **IL TASTO "INS":** Attiva la sovrascrittura del testo
37. **IL TERMINE BACKUP INDICA:** Una procedura per salvare i propri file in un altro supporto di archiviazione
38. **IL TERMINE MP3 INDICA:** Un formato di compressione dei file audio
39. **IL TERMINE WI-FI INDICA:** Reti locali senza fili
40. **IN UN TRASFERIMENTO DMA:** Un blocco di memoria viene copiato da una periferica ad un'altra
41. **IN UNA RETE LOCALE DINAMICA:** Ogni macchina decide in autonomia se trasmettere o meno

42. **IN UNA RETE LOCALE STATICA:** Una macchina può trasmettere solo se è attivo il proprio turno
43. **IN UNA RETE PEER TO PEER:** Tutte le postazioni possono essere considerate client e server
44. **INTERNET E':** Una rete di calcolatori
45. **COSA E' LA CPU (CENTRAL PROCESSING UNIT):** L'unità centrale di elaborazione di tutte le operazioni fatte dal computer
46. **LA DEFRAMMENTAZIONE DEL DISCO ANDREBBE ESEGUITA:** Quando si nota un rallentamento del funzionamento dell'hard disk
47. **LA FRECCIA CHE RAPPRESENTA IL MOUSE SUL MONITOR E' CHIAMATA:** Puntatore
48. **LA LICENZA D'USO DI UN SOFTWARE INDICA:** Un contratto legale tra l'autore del software e l'utente
49. **LA MEMORIA VIRTUALE E' DEFINIBILE COME:** La capacità di utilizzare spazio sull'hard disk come fosse memoria RAM addizionale
50. **LA MISURA DI BASE DELLA VELOCITA' DEL PROCESSORE E':** Hertz
51. **LA PIU' PICCOLA UNITA' DI INFORMAZIONE VIENE CHIAMATA:** Bit
52. **LA RISOLUZIONE DELLO SCHERMO DEL MONITOR (640 X 480, 800 X 600 ....) INDICA UNA MISURA ESPRESSA IN:** Pixel
53. **LA SCHEDA MADRE E':** Una superficie di circuiti stampati dove trovano alloggiamento le varie schede delle periferiche e la CPU
54. **LA SIGLA RAM IDENTIFICA:** Memoria ad accesso casuale
55. **LA SIGLA ROM IDENTIFICA:** Memoria di sola lettura
56. **LA SIGLA WWW SIGNIFICA:** World wide web
57. **LA TRASMISSIONE DI PAGINE WEB UTILIZZA:** Il protocollo http
58. **COSA SIGNIFICA L'ACRONIMO "http":** Hyper text Trasfer Protocoll
59. **L'INFORMATICA PER DEFINIZIONE E' UNA SCIENZA CHE SI OCCUPA DI:** Trattamento delle informazioni
60. **L'INSIEME DELLE REGOLE CHE PERMETTE AI COMPUTER DI SCAMBIARSI INFORMAZIONI SI CHIAMA:** Protocollo
61. **NELL'INDIRIZZO DI POSTA ELETTRONICA "XXX@YYY.COM" QUALE' L'IDENTIFICATIVO DELL'UTENTE E QUALE QUELLO DEL DOMINIO?** La parte che precede il carattere at (chiocciola) è l'identificativo dell'utente, quella che la segue è l'identificativo del dominio
62. **NELL'INFORMATICA COSA SIGNIFICA IL TERMINE CHIP?** E' un circuito integrato
63. **PER COLLEGARE IL COMPUTER IN RETE LOCALE, DI QUALE SUPPORTO HARDWARE SI HA BISOGNO?** Scheda di rete
64. **UN FILE PUO' ESSERE DEFINITO COME:** Una elementare unità di archiviazione di dati avente un nome
65. **UN INTERNET SERVICE PROVIDER E':** Una struttura commerciale o una organizzazione che offre agli utenti accesso a Internet
66. **UN MODEM E' INDISPENSABILE PER:** Collegare due calcolatori mediante linea telefonica
67. **UNA SCHEDA DI RETE E':** Un' interfaccia bidirezionale per collegarsi ad altri calcolatori
68. **UNA STAMPANTE LASER HA TRA LE SUE COMPONENTI:** Tamburo fotosensibile
69. **UNO "SCANNER" E':** Una periferica in grado di digitalizzare degli stampati
70. **«PANNELLO DI CONTROLLO» DI WINDOWS È UNA FUNZIONALITÀ CHE PERMETTE DI:** Configurare tutte le periferiche connesse e il sistema operativo
71. **A COSA SERVE LA BARRA DEGLI INDIRIZZI?** Ad indicare in quale cartella ci si trova
72. **CHE COSA IDENTIFICA IL TERMINE "WEB"?** La interconnessione globale di reti di computer
73. **CHE COSA INDICA L'ESTENSIONE DI UN FILE?** Una sigla attribuita al file dal sistema operativo o da programmi applicativi
74. **CHE COSA SI INTENDE PER "CORSIVO" IN UN SISTEMA DI VIDEOSCRITTURA?** Un particolare tipo di visualizzazione e stampa del carattere
75. **CHE COSA SI INTENDE PER «FOGLIO DI CALCOLO»?** Un programma che permette l'elaborazione e la manipolazione di tabelle con dati numerici
76. **CHE COSA SI INTENDE PER «TESTO GIUSTIFICATO» IN UN PROGRAMMA DI ELABORAZIONE TESTI?** Testo in cui la larghezza di ogni riga del paragrafo è adattata ai margini della pagina
77. **CHE COS'È UN SISTEMA OPERATIVO?** É un insieme di programmi di base per la gestione del computer

78. **CHE DIFFERENZA C'È TRA I TERMINI «HARDWARE» E «SOFTWARE»?** Hardware indica tutte le parti fisiche, elettroniche e meccaniche di un computer, software indica l'insieme dei programmi che permettono ad un computer di funzionare
79. **CHE DIFFERENZA C'È TRA UN MONITOR DA 17 POLLICI E UNO DA 14 POLLICI?** Quello da 17 pollici ha una superficie visiva maggiore di quello da 14 pollici
80. **CHE DIFFERENZA C'È TRA UNA MEMORIA QUALE UN DISCO FISSO E UNA MEMORIA RAM?** La memoria RAM perde i dati allo spegnimento del computer mentre il disco fisso conserva i dati anche dopo lo spegnimento
81. **CHE TIPO DI FILE È POSSIBILE ALLEGARE AD UN MESSAGGIO DI POSTA ELETTRONICA?** Qualsiasi tipo di file
82. **COME SI CHIAMA IL SERVER DELLA POSTA IN USCITA?** SMTP - simple mail transport protocol
83. **COME SI PUÒ CHIUDERE UNA FINESTRA DI WINDOWS UTILIZZANDO I SOLI TASTI?** Premendo «Alt+F4»
84. **COME SI PUÒ DEFINIRE ACCESS?** Un software adatto alla gestione di dati (o Database)
85. **CON QUALE PARTE DELL'HARDWARE VIENE SELEZIONATO IL TESTO?** Con il mouse o con la tastiera
86. **COSA È UN E-MAIL (ELECTRONIC MAIL)?** É un servizio che consente di scambiare messaggi elettronici tra utenti di computer utilizzando la rete internet
87. **COSA È UN FIREWALL?** Un sistema di sicurezza che consente di impedire l'accesso, non autorizzato, ad una rete
88. **COSA È UNA WEBCAM?** É una video-camera collegata ad Internet che rende disponibili in rete le immagini riprese ad intervalli regolari (solitamente alcuni minuti)
89. **COSA INDICA IL TERMINE "WIRELESS"?** Indica i sistemi di comunicazione tra dispositivi elettronici, che non fanno uso di cavi
90. **COSA S'INTENDE CON L'ACRONIMO DVD?** Digital Versatile Disc
91. **COSA SI INTENDE CON LA PAROLA «DRIVER»?** Un programma che permette il colloquio tra un computer ed una particolare periferica
92. **COSA SI INTENDE PER «CASE» DI UN COMPUTER?** Il contenitore in cui sono installati e connessi tutti i componenti dell'unità centrale del computer
93. **IN EXCEL, QUALE È L'EFFETTO DELL'ISTRUZIONE: =A2*10?** Moltiplica per 10 il valore della cella A2
94. **IN EXCEL, QUALE È L'EFFETTO DELL'ISTRUZIONE: =A2/10?** Divide per 10 il valore della cella A2
95. **IN EXCEL, QUALE È L'EFFETTO DELL'ISTRUZIONE: =A2+10?** Addiziona 10 al valore della cella A2
96. **IN EXCEL, QUALE È L'EFFETTO DELL'ISTRUZIONE: =A2-10?** Sottrae 10 al valore della cella A2
97. **IN MICROSOFT WORD, PER APRIRE UN DOCUMENTO ESISTENTE...** Si seleziona "File" – "Apri"
98. **IN MICROSOFT WORD, PER CHIUDERE UN DOCUMENTO SENZA CHIUDERE IL PROGRAMMA...** Bisogna selezionare dal menù File l'opzione Chiudi
99. **IN UN FOGLIO ELETTRONICO È POSSIBILE ORDINARE AUTOMATICAMENTE I DATI?** Si

100. **IN WINDOWS COSA INDICA IL TERMINE «CARTELLA»?** Un «contenitore» di file

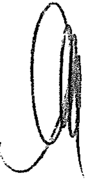
All. 1° A

P-20200023486

Concorso Pubblico per l'assunzione a tempo indeterminato di n. 1 unità nel profilo di "Dirigente Medico - disciplina di Oncologia"

Caso Clinico n. 1

PROVA ESTRATTA



P-20200023486

Caso Clinico 1

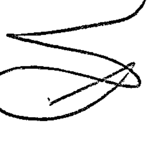
Maschio di 19 anni, insorgenza acuta di dolore in reg cervicale, deficit progressivo di forza agli arti superiori

Accesso in PS

TAC Total Body: linfonodi patologici retro-peritoneali, metastasi cerebrali, interessamento della colonna cervicale (anche RMN)

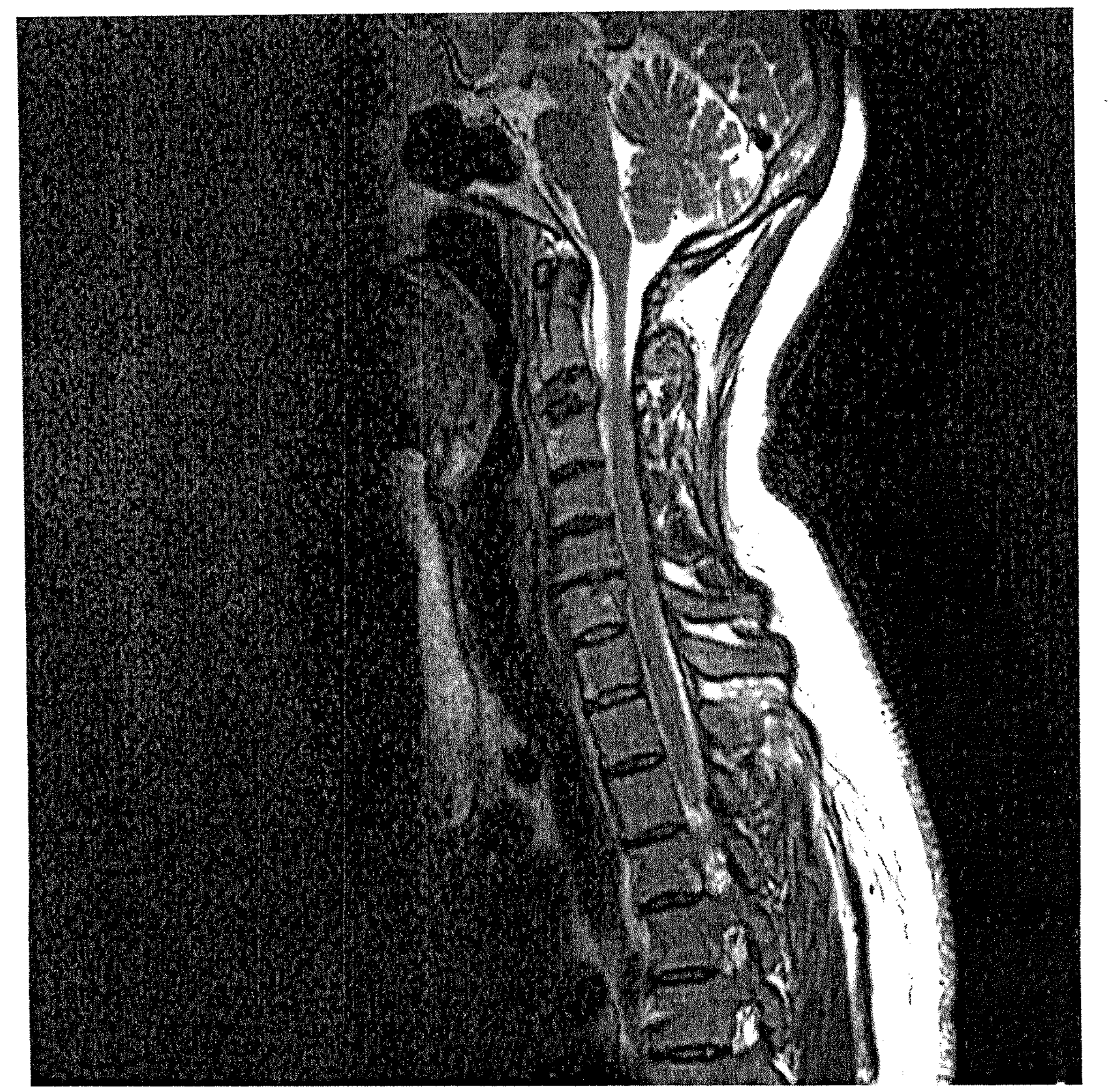
Massa scrotale dx 4,5 cm

AFP 490 ng/ml, betaHCG 18.000 U/l, LDH 1.100 U/l



All. 1PA

P-20200023486



- Intervento di corpectomia C3 + stabilizzazione C2-4
  Es. istologico: tumore germinale non-seminoma
- Completo recupero funzionale

P.202000023486

Diagnosi:

Tumore germinale misto del testicolo metastatico
(osso, encefalo, linfonodi reproperotonali)

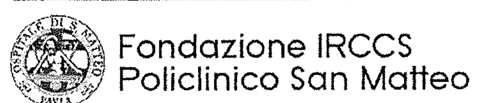
Descrivere in modo sintetico:

Se e quali ulteriori accertamenti clinici e strumentali

Quale ulteriore terapia

Prognosi, sulla base di quali elementi

All. 10 B



Sistema Socio Sanitario

Regione Lombardia

P-20200023486

Concorso Pubblico per l'assunzione a tempo indeterminato di n. 1 unità nel profilo di "Dirigente Medico - disciplina di Oncologia"

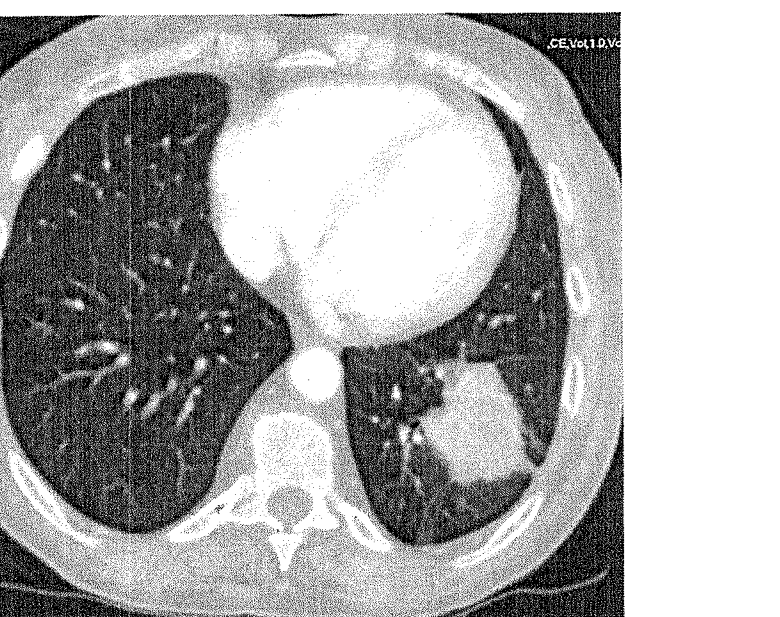
Caso Clinico n. 2

Prova non estratta

P-202000023486

ALL. 10B

Caso Clinico 2



- Donna di 53 anni, non fumatrice
- Episodi di tosse secca
- Rx torace, poi TAC TB: lesione neoplastica 4,3 cm localizzata al lobo inf sx; non adenopatie mediastiniche.

Secondarismi epatici

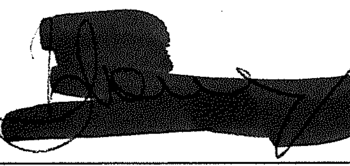
- Biopsia TC guidata: adenocarcinoma TTF1+,

Pare non esatto

P-20200023486

Diagnosi:

Adenocarcinoma polmonare, metastatico



Descrivere in modo sintetico:

Quali ulteriori accertamenti

Quale orientamento terapeutico anche in relazione agli accertamenti eseguiti

Sistema Socio Sanitario

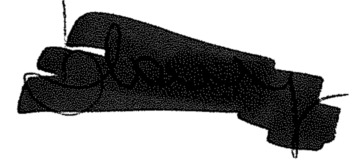
Regione Lombardia

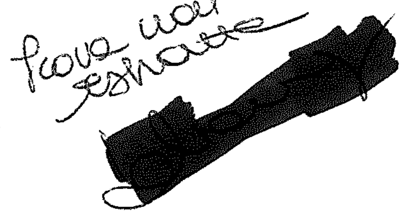
P-20200023486

Concorso Pubblico per l'assunzione a tempo indeterminato di n. 1 unità nel profilo di "Dirigente Medico - disciplina di Oncologia"

Caso Clinico n. 3

Prova non estratta





Caso Clinico 3

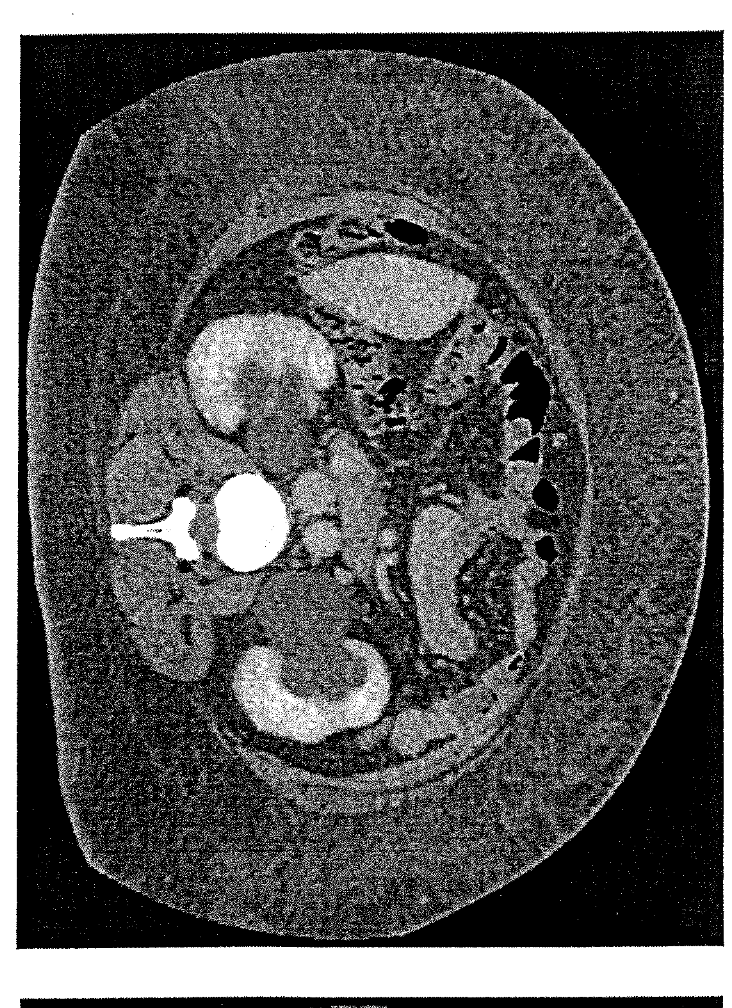
Donna di 51 anni, accesso in PS per dolori addominali ingravescenti e dispnea
APR: linfoma di Hodgkin mediastinico (2003) sottoposto a CT/RT, CIN2 (2009) sottoposto a conizzazione

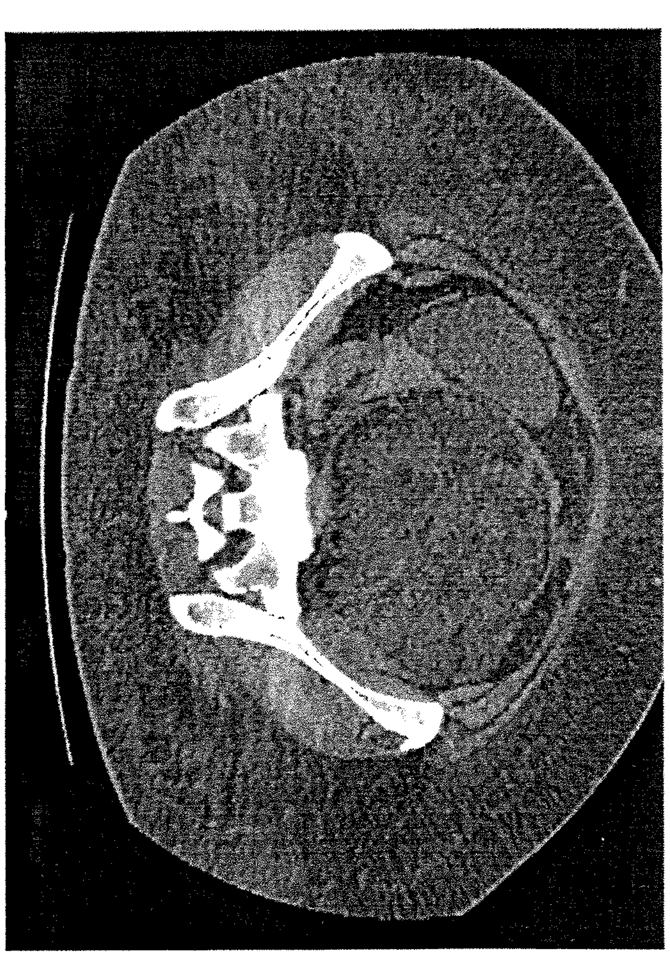
TC Torace-addome con MdC: «…versamento pleurico bilaterale, scompenso cardiaco con congestione ilare bilaterale; in pelvi massa a densità disomogenea di cm 20x14x13 a densità adiposa, comprime e disloca l'utero, gli annessi, la vescica e le anse intestinali; compressi anche i vasi arteriosi e venosi iliaci a sinistra; idroureteronefrosi bilaterale; formazione sospetta al V segmento epatico di mm 53x41.

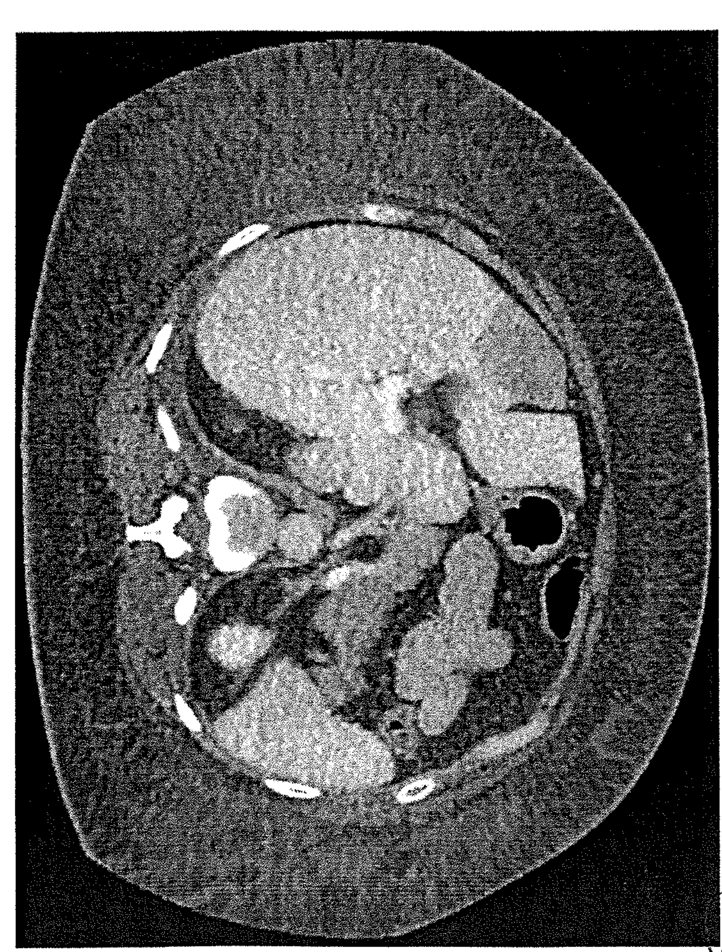
EcoCG: VS lievemente dilatato con funzione sistolica conservata (FE53%), pressione polmonare ai limiti superiori (PAPs 35 mmHg); terapia medica cardiologica con correzione dello scompenso; risoluzione del versamento pleurico

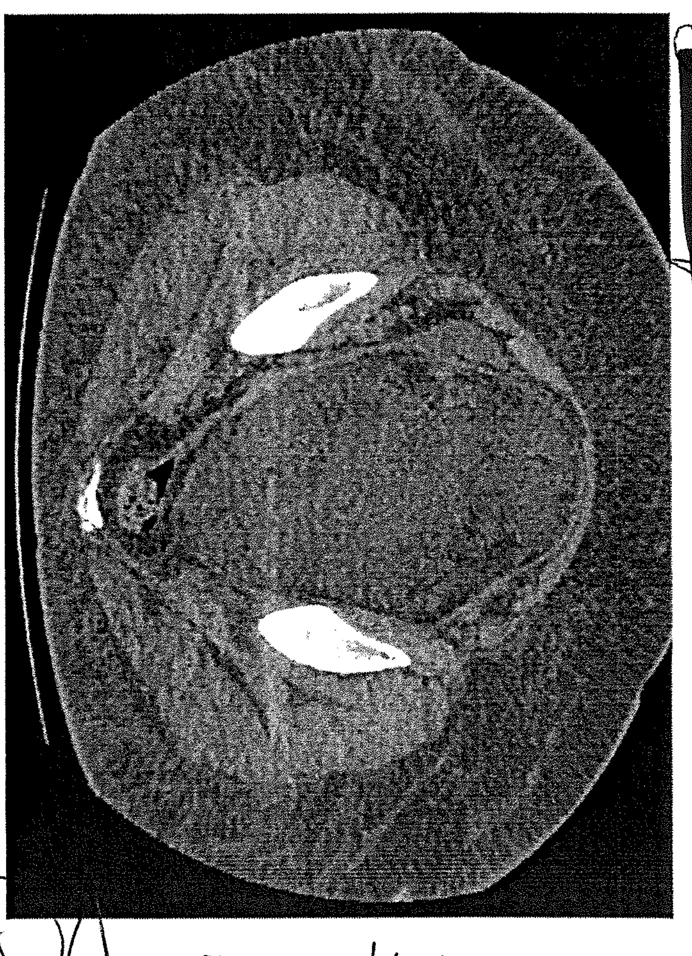
Posizionati stent ureterali bilaterali

Biopsia ECO guidata massa: **liposarcoma ben differenziato secondo WHO 2020**









Prove non estratte P-202000023486

Diagnosi:

Voluminoso liposarcoma retroperitoneale

Descrivere in modo sintetico:

1. Quali ulteriori accertamenti

2. Quale terapia

All. 18

Received: 8 June 2020 | Revised: 21 August 2020 | Accepted: 25 August 2020

DOI: 10.1002/cam4.3461

ORIGINAL RESEARCH

Cancer Medicine WILEY

Health care-related time costs in patients with metastatic breast cancer

Gabrielle B. Rocque[1,2,3] | Courtney P. Williams[1] | Stacey A. Ingram[1] | Andres Azuero[4] | Stephen T. Mennemeyer[5] | Jennifer Young Pierce[6] | Ryan D. Nipp[7] | Katherine E. Reeder-Hayes[8] | Kelly M. Kenzik[1]

[1]Division of Hematology & Oncology, University of Alabama at Birmingham (UAB), Birmingham, AL, USA

[2]O'Neal Comprehensive Cancer Center, University of Alabama at Birmingham, Birmingham, AL, USA

[3]Division of Gerontology, Geriatrics, and Palliative Care, University of Alabama at Birmingham, Birmingham, AL, USA

[4]School of Nursing, University of Alabama at Birmingham (UAB), Birmingham, AL, USA

[5]School of Public Health, University of Alabama at Birmingham (UAB), Birmingham, AL, USA

[6]Mitchell Cancer Institute, University of South Alabama, Mobile, AL, USA

[7]Division of Hematology & Oncology, Massachusetts General Hospital Cancer Center and Harvard Medical School, Boston, MA, USA

[8]Lineberger Comprehensive Cancer Center, University of North Carolina, Chapel Hill, NC, USA

Correspondence
Gabrielle B. Rocque, UAB Department of Medicine, Division of Hematology & Oncology, 1720 2nd Avenue South, Birmingham, AL 35294, USA.
Email: grocque@uabmc.edu

Funding information
This work was supported by a grant from Genentech (G-55600).

Abstract

Background: Burdens related to time spent receiving cancer care may be substantial for patients with incurable, life-limiting cancers such as metastatic breast cancer (MBC). Estimates of time spent on health care are needed to inform treatment-related decision-making.

Methods: Estimates of time spent receiving cancer-related health care in the initial 3 months of treatment for patients with MBC were calculated using the following data sources: (a) direct observations from a time-in-motion quality improvement evaluation (process mapping); (b) cross-sectional patient surveys; and (c) administrative claims. Average ambulatory, inpatient, and total health care time were calculated for specific treatments which differed by antineoplastic type and administration method, including fulvestrant (injection, hormonal), letrozole (oral, hormonal), capecitabine (oral, chemotherapy), and paclitaxel (infusion, chemotherapy).

Results: Average total time spent on health care ranged from 7% to 10% of all days included within the initial 3 months of treatment, depending on treatment. The greatest time contributions were time spent traveling for care and on inpatient services. Time with providers contributed modestly to total care time. Patients receiving infusion/injection treatments, compared with those receiving oral therapy, spent more time in ambulatory care. Health care time was higher for patients receiving chemotherapeutic agents compared to those receiving hormonal agents.

Conclusion: Time spent traveling and receiving inpatient care represented a substantial burden to patients with MBC, with variation in time by treatment type and administration method.

KEYWORDS
indirect costs, metastatic breast cancer, patient time

Portions of this study were presented at the 2018 and 2019 ASCO Quality Care Symposium and the 2018 Society for Medical Decision Making Annual Meeting.

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.
© 2020 The Authors. *Cancer Medicine* published by John Wiley & Sons Ltd.

M. 16

1 | INTRODUCTION

Financial toxicity due to the direct out-of-pocket costs of care is central to patients' value equation,[1-3] yet indirect costs, such as time spent receiving care, are understudied.[4,5] Such time costs can be substantial, with a previous study estimating 270 hours spent on breast cancer-related care in the final year of life.[6] The indirect cost of time receiving metastatic breast cancer (MBC)-related care comes at the expense of time spent on important activities, lost work productivity, time spent with family and friends, or time spent on leisure activities.

Time-related indirect costs are key considerations for patients when making MBC treatment decisions.[7] Due to the increasing treatment options and varied patient preferences regarding treatment logistics,[7,8] opportunities exist for shared decision-making for patients with MBC. Over 45 guideline-based treatment options exist for MBC,[8] with varying clinical time needed for administration and monitoring. Ambulatory care time may be exacerbated for patients who travel significant distances for cancer care, with our recent study finding 24% of patients with cancer traveling over an hour to receive care.[9] Limited local cancer care resources may necessitate traveling greater distances, particularly since many community cancer clinics have closed in recent years.[10]

The primary goal of this study was to quantify the time spent on cancer care over a 3-month period for specific medications that differ by route of administration (infusion/injection vs oral) and class (chemotherapy vs hormonal therapy). We hypothesized that (a) time spent on cancer care would be substantial; (b) patients receiving infused/injected therapy would spend more time on care than those receiving oral therapy; and (c) patients receiving chemotherapy would spend more time on care than those receiving hormonal therapy.

2 | MATERIALS AND METHODS

2.1 | Study design

Time spent receiving cancer care in the initial 3 months of treatment for patients with MBC was estimated using the following data sources: (a) direct observations from a time-in-motion quality improvement evaluation (process mapping); (b) patient surveys; and (c) administrative claims. Multiple data sources were selected due to each source's strengths in assessing a component of the time equation. Given the normal course of care would include imaging at approximately 3 months to evaluate treatment response, we restricted the analysis to the first 3 months on each drug to capture the initial treatment period without accounting for change in therapy due to progression. This study was approved by the University of Alabama at Birmingham (UAB) Institutional Review Board.

2.2 | Data sources

2.2.1 | Process mapping

Patients with MBC were observed at UAB by recording time spent in cancer-related clinical encounters from November 2016 to June 2017. Each patient was observed once. Inclusion criteria included women age ≥ 18 receiving active treatment for MBC. A convenience sample of patients was mapped to represent differing clinic visits including follow-up, infusion, labs, bone scans, computed tomography (CT) scans, and positron emission tomography scans. For each clinical encounter, patient time was captured from clinic arrival to departure and categorized by time with each health care professional (eg, infusion nurse, front desk staff) and time at each encounter location (eg, infusion chair, waiting room).

2.2.2 | Patient surveys

Cross-sectional survey data were prospectively collected on women with MBC at two Alabama academic medical centers in the Southeast to evaluate employment status, MBC-related hours missed from work, time spent traveling from home to clinic, and time spent on cancer care-related activities outside of clinic. Surveys were collected from June 2017 to June 2019. All women age ≥ 18 receiving treatment for MBC were eligible, which could include those who were observed for process mapping. Exclusion criteria included non-English speakers, patients residing in nursing homes, or patients receiving hospice care. Participants received a token gift for participation.

2.2.3 | Administrative claims data

Administrative claims were utilized to characterize the drug-specific frequency of specific clinical services or events (physician visits, labs, imaging). We assessed claims-based treatments and clinical events for patients receiving MBC treatment during 2007-2013 within the Surveillance, Epidemiology and End Results (SEER)-Medicare linked database. Patient diagnosis data were abstracted using ICD-9 diagnosis codes for malignant neoplasm of female breast, as well as claims for secondary metastases on at least two different dates using the provider analysis and review (MEDPAR) datafile. The patient entitlement and diagnosis summary file was also used to abstract demographic and diagnosis data. The following antineoplastic agents were selected to represent different administration methods and drug classes: fulvestrant (injection, hormonal), letrozole (oral, hormonal), capecitabine (oral, chemotherapy), and paclitaxel (infusion, chemotherapy). These medications were selected

because they were the most common medication for each modality and type of therapy in the SEER-Medicare database. Antineoplastic agents were identified using Healthcare Common Procedure Coding System, National Drug Codes, or generic drug names from national claims history, outpatient, durable medical equipment, or prescription drug event files. All treatments were received at mutually exclusive timepoints. Clinical events, including complete blood counts, complete metabolic panels, CT scans, and bone scans were captured using the same datafiles (Table S1). Inpatient hospitalizations and corresponding lengths of stay were captured using the MEDPAR datafile. Patients without complete coverage (including Part D) for the entire initial treatment period, in nursing homes, or receiving hospice care during the study period were excluded. Analyses were repeated in the Truven Health Analytics MarketScan Research Database to understand if results were similar in a younger sample.

2.3 | Outcome: Patient health care time

Cancer care-related time was calculated using data from all three sources (Figure 1).[11] Ambulatory care time, or time spent on routine care, was calculated using the following equation:

$$\begin{aligned}\text{Average total ambulatory care time} = & (\text{Average time spent traveling to and from clinic}_{\text{survey}} \times \text{Lab rate}_{\text{claims}}) \\ & + (\text{Average non-clinic visit infusion time}_{\text{direct observation}} \times \text{Infusion rate}_{\text{claims}}) \\ & + (\text{Average clinic visit time}_{\text{direct observation}} \times \text{Clinic visit rate}_{\text{claims}}) \\ & + (\text{Average lab time}_{\text{direct observation}} \times \text{Lab rate}_{\text{claims}}) \\ & + (\text{Average CT scan time}_{\text{direct observation}} \times \text{CT scan rate}_{\text{claims}}) \\ & + (\text{Average bone scan time}_{\text{direct observation}} \times \text{Bone scan rate}_{\text{claims}}).\end{aligned}$$

This equation assumes that the patient would receive services on the same day where possible to minimize travel burden.

For patients with inpatient admissions, inpatient care time, or time spent on nonroutine care, was calculated using the following equation:

$$\begin{aligned}&\text{Average total inpatient care time} \\ &= \text{Average inpatient hospitalization length of stay}_{\text{claims}} \\ &\times \text{Inpatient hospitalization rate}_{\text{claims}},\end{aligned}$$

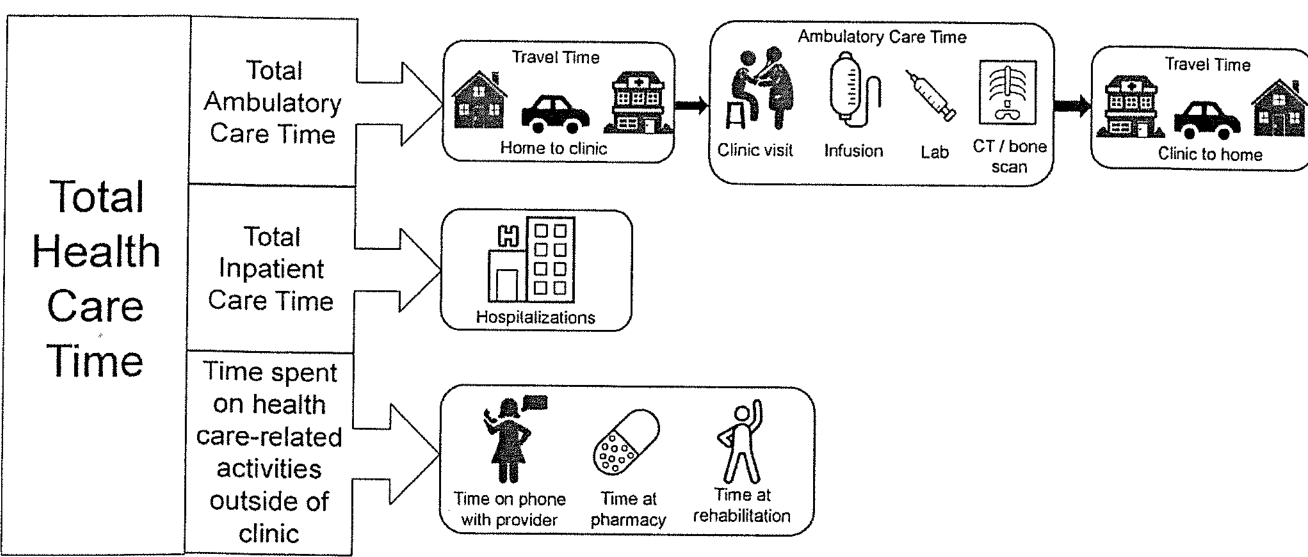


FIGURE 1 Components of time equation: Ambulatory care time, inpatient time, time spent on health care-related activities outside of clinic

Total time spent on health care was calculated using the sum of ambulatory care time, inpatient care time, and time spent on other health care-related activities outside of clinic, which was captured from the survey data.

$$\text{Average total health care} = \text{Average total ambulatory care time}$$
$$+\text{Average total inpatient care time}$$
$$+\text{Average time spent on healthcare}-\text{related activities outside of clinic}_{\text{survey}},$$

2.4 | Statistical analysis

2.4.1 | All data

Descriptive statistics included means and standard deviations (SDs) or medians and interquartile ranges (IQRs) for continuous variables and frequencies for categorical variables.

2.4.2 | Administrative claims data

Drug-specific event frequencies were abstracted from the claims data and used to calculate person-month event rates during the first 3 months on treatment. Sensitivity analyses were calculated using the MarketScan Database.

3 | RESULTS

3.1 | Process mapping

We directly observed a single clinic visit for 39 patients with MBC, who received a variety of services (Table S2).These patients were a median of 58 years old (IQR 48-65), 26% other race (not White), 85% hormone receptor-positive, 82% human epidermal growth factor receptor 2-negative, and 67% privately insured (Table 1).Patients were a median 12 months from metastatic diagnosis (IQR 6-24). Figure 2 details process mapping data for a clinic follow-up visit. On average, patients spent 4 minutes (SD 1 minutes) with their medical technician, 10 minutes (SD 10 minutes) with their nurse, 17 minutes (SD 10 minutes) with their oncologist, 18 minutes (SD 12 minutes) with their pharmacist, and 18 minutes (SD 16 minutes) with other care team members (social workers, patient navigators, chaplains). Of all shadowed patients with MBC, an average of 220 minutes (SD 105 minutes) was spent either waiting or receiving care at a typical clinical encounter, including 95 minutes (SD 44 minutes) in clinic, 123 minutes in infusion for patients receiving infusion (n = 17, SD 86 minutes), and 19 minutes (SD 23 minutes) in lab (Table 2). Process maps for visits including infusion, labs, and scans are detailed in Figures S1-S4.

3.2 | Patient survey

Of 143 patients approached for survey participation, 132 (92%) consented. Of consenting patients, 100 (76%) completed the survey; 9 were excluded due to missing data, resulting in a final sample of 91 patients. Of respondents, median age was 58 (IQR 48-66), 31% were Black, 41% held a college degree, and 43% had a household income of <$40,000 (Table 1).Most patients were retired (29%), 15% worked full-time, 8% worked part-time, and 20% were on disability. Patients were a median 24 months from metastatic diagnosis (IQR 10-39). In an average week, patients reported spending a mean of 77 minutes (SD 59), traveling from their home to clinic and a mean of 156 minutes per week (SD 106) receiving care at their clinic visit. Patients spent a mean of 66 minutes (SD 99) in an average week on cancer care-related activities outside of clinic (eg, travel to pharmacy, calls with nurse, physical therapy). For working women, a mean of 10 hours (SD 13) was missed from work during an average week.

3.3 | Administrative claims

patient samples, since women

Rates of clinical events during the initial 3 months of treatment are shown in Table 2. Higher per person rates of lab events in the first 3 months were found in patients receiving chemotherapy (capecitabine = 4.8, paclitaxel = 9.8) compared to those receiving hormonal therapy (fulvestrant = 3.5, letrozole = 3.3). Infusion rates were also higher for infusion chemotherapy in the initial 3 months of treatment (paclitaxel = 7.9) compared to infusion/injection hormone therapy (fulvestrant = 3.9). Similar rates of scans were found in patients receiving differing therapy types, with about one of each imaging test in the initial 3 months from treatment initiation. Rates of clinical events in the MarketScan database were similar to those in the SEER-Medicare database (Table S3).

3.4 | Estimation of total health care time: Combined results from all data sources

During the initial 3 months of treatment, estimated time spent on ambulatory care was highest for patients receiving

μη

TABLE 1 Patient demographics and clinical characteristics for patient cohorts

	Survey	SEER-Medicare	Shadowed
	N = 91	N = 3433	N = 39
	n (%)	n (%)	n (%)
Age (median, IQR)	58 (48-66)	70 (65-78)	58 (48-65)
Race			
White	63 (69.2)	2731 (79.6)	29 (74.4)
Other	28 (30.8)	702 (20.5)	10 (25.6)
Education			
College degree	37 (40.7)	24.9%[a]	—
<College degree	50 (55.0)	75.1%[a]	—
Unknown	4 (4.4)	—	—
Income			
≥$40,000	39 (42.9)	[b]	—
<$40,000	39 (42.9)	[b]	—
Unknown	13 (14.3)	—	—
Marital status			
Single/divorced/widowed	45 (49.5)	—	12 (30.8)
Married	46 (50.5)	—	27 (69.2)
Type of metastatic disease			
De novo	38 (41.8)	601 (17.5)	
Secondary metastatic disease	53 (58.2)	2832 (82.5)	
Hormone receptor status			
Positive	73 (80.2)	2779 (81.0)	33 (84.6)
Negative	17 (18.7)	327 (9.5)	5 (12.8)
Unknown	1 (1.1)	327 (9.5)	1 (2.6)
HER2 status			
Positive	26 (28.6)	90 (2.6)	6 (15.4)
Negative	61 (67.0)	430 (12.5)	32 (82.1)
Unknown	4 (4.4)	2913 (84.9)	1 (2.6)
Insurance status			
Private	41 (45.1)	—	26 (66.7)
Medicare	36 (39.6)	2130 (62.0)	9 (23.1)
Medicaid	14 (15.4)	1303 (38.0)[c]	4 (10.3)

Abbreviations: HER2, human epidermal growth factor receptor 2; IQR, interquartile range.

[a]Census track percent education.

[b]Census track poverty level of ≥ 20% = 21.7%.

[c]Dual eligible with Medicare n (%).

weekly infused paclitaxel chemotherapy, (62.4 hours) and lowest for patients on oral letrozole hormonal therapy (20.9 hours; Table 2). Patients receiving injection/intravenous treatments, compared with those receiving oral therapy, spent more time in ambulatory care for both hormonal (fulvestrant = 30.4 hours vs letrozole = 20.9 hours) and chemotherapy (paclitaxel = 62.4 hours vs capecitabine = 26.6 hours). The greatest contribution to time spent on ambulatory care was travel time (30%-47% of total). This was notably greater for treatments that required more frequent ambulatory care visits, such as paclitaxel. In contrast, ambulatory care time spent with a physician represented only 23%-37% of total ambulatory care time. After incorporating time spent on health care-related activities outside of clinic, total time receiving routine health care during the initial 3 months of treatment ranged from 34.1 hours for patients receiving letrozole to 75.6 hours for patients receiving paclitaxel.

Overall, 12% of patients had an inpatient hospitalization during their 3-month timeframe, including 13% receiving letrozole, 9% receiving fulvestrant, 12% receiving capecitabine, and 17% receiving paclitaxel. Inpatient admissions were primarily treatment related, with shortness of breath and fever being the most frequent reasons for admissions (both 5% of total admissions). For hospitalized patients, average total time spent on health care including nonroutine inpatient care ranged from 6.4 to 9.3 days, which is 7%-10% of all days included within the initial 3 months of treatment. Total health care time was dominated by their inpatient admission, which represented 78%, 77%, 80%, and 66% of total health care time for patients receiving letrozole, fulvestrant, capecitabine, and paclitaxel, respectively. Similar inpatient hospitalization rates and average length of stay (letrozole 6.2 days, fulvestrant 4.7 days, capecitabine 5.1 days, paclitaxel 5.1 days) were found for these four common treatments.

4 | DISCUSSION

In this study of care time among women with MBC, we estimated an average of 1.4-3.1 days spent traveling to, waiting for, and receiving cancer care during the initial 3 months of treatment. Relatively little time was spent communicating in-person with a provider. Time varied by treatment regimen, with infused/injected antineoplastic therapies requiring greater time commitments than oral treatment and chemotherapies more than hormonal therapies. In this study, patients spent an average of 220 minutes at a typical clinical encounter. These estimates are greater than previously reported estimates by Yabroff and colleagues, who utilized Medical Expenditure Panel Survey data to construct ambulatory time estimates for patients with cancer.[4] While differences may reflect clinic variability or differences in data collection methods (survey vs direct observation), the overall ambulatory time of more than 3 hours in either study may come as a surprise to oncologists who spend approximately 20 minutes with patients in a typical clinic encounter.

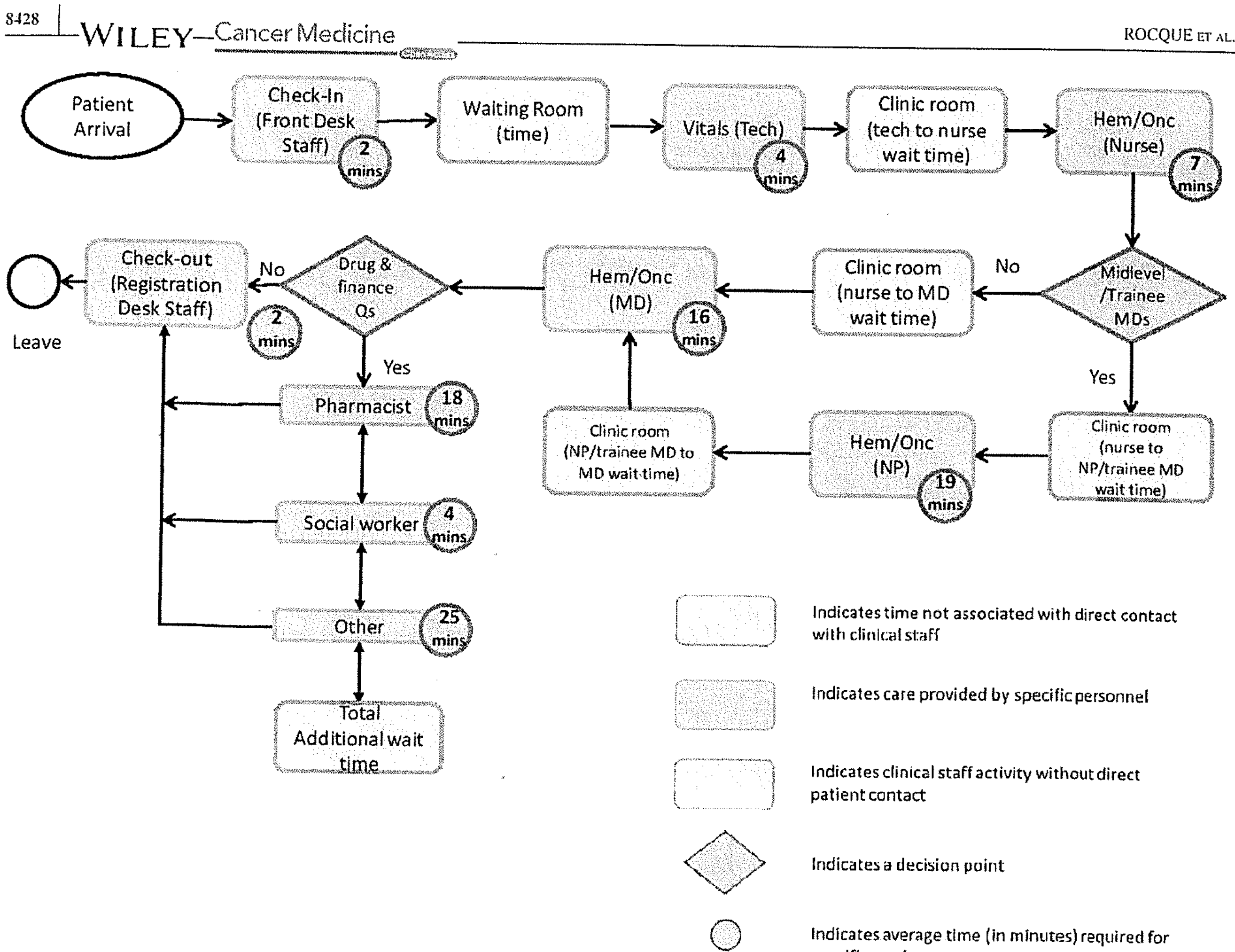


FIGURE 2 Process map: Physician follow-up visit

The greatest component of patient ambulatory care time was not time with the oncologist, but rather time spent traveling. Previous literature has reported associations between increased distance and time traveled to care for patients with more advanced disease stages.[12-18] However, our findings demonstrated a considerably higher travel time of 155 minutes compared with that reported by Yabroff et al, who reported average travel times of 35-39 minutes.[4] This may reflect differences in the patient samples, since women with MBC living in the Deep South may travel greater distances for specialized treatment at a tertiary care center compared to a nationally representative sample of patients with cancer treated in both local and tertiary care environments. Our study also highlights the impact of clinic visit frequency on travel time, even for patients with shorter travel distances. This component contributed to observed differences in time spent on health care across different treatment modalities and types, with infusion therapy leading to a greater burden on patient indirect costs than oral therapies and greater time for patient on chemotherapy than hormonal therapies. This is likely related to more frequent encounters with the health care system due to higher rates of lab and clinical monitoring for patients receiving infusion/injection chemotherapy treatment. Thus, due to the potential implications on daily life, oncologists should consider both treatment type and modality when discussing treatment options with patients. Furthermore, clinicians in tertiary care settings should consider recommending local providers for monitoring and treatment where possible.

For the one in nine patients anticipated to have an inpatient admission during their initial 3 months on treatment, we found a strikingly high proportion of time attributed to their admission, which is infrequently considered in traditional cost evaluation models. Specifically, hospitalizations accounted for 66%-80% of patients' total time spent on health care. Importantly, hospitalization rates were similar across treatments, which may reflect a population who is often admitted for symptom management or complications of disease, rather than complications of treatment. While hospitalizations occurring during cancer care are frequently targeted in payment reform efforts, such as the Oncology Care Model,[19] little emphasis has been placed on indirect costs or productivity losses for patients hospitalized during treatment. Given the substantial impact on patient time, efforts to reduce hospitalization should be considered.

TABLE 2 Drug-specific time spent to, in, and from oncology clinic visit during 3 mo on treatment for metastatic breast cancer patients in the SEER-Medicare database

	Average minutes	Rate: Letrozole	Rate: Fulvestrant	Rate: Capecitabine	Rate: Paclitaxel
Process mapping data					
Clinic visit time	95				
Lab time	19				
Infusion only (nonclinic visit) time	123				
Bone scan time	134				
Computed tomography scan time	68				
Survey data					
Time spent traveling to/from clinic	154.5				
Weekly time spent on health care-related activities outside of clinic	66				
SEER-Medicare data					
Clinic visit rate		4.9	5.5	6.1	8.9
Lab rate		3.3	3.5	4.8	9.8
Infusion rate		—	3.9	—	7.9
Bone scan rate		1.0	1.0	0.7	1.1
Computed tomography scan rate		1.2	1.2	1.3	1.4
Inpatient hospitalization rate		0.8	1.3	1.3	1.2
Inpatient hospitalization length of stay		6.2 d	4.7 d	5.1 d	5.1 d
Time calculations					
Travel time = (Time spent traveling to and from clinic × Lab rate)		509.9 min	540.8 min	741.6 min	1514.1 min
Infusion time = (Nonclinic visit infusion time × Infusion rate)		0 min	479.7 min	0 min	971.7 min
Total clinic visit time = (Clinic visit time × Clinic visit rate)		465.5 min	522.5 min	579.5 min	845.5 min
Total lab time = (Lab time × Lab rate)		62.7 min	66.5 min	91.2 min	169.1 min
Total computed tomography scan time = (CT scan time × CT scan rate)		81.6 min	81.6 min	88.4 min	95.2 min
Total bone scan time = (Bone scan time × Bone scan rate)		134 min	134 min	93.8 min	147.4 min
Total ambulatory care time		20.9 h	30.4 h	26.6 h	62.4 h
Time spent on health care-related activities outside of clinic		13.2 h	13.2 h	13.2 h	13.2 h
Total health care time (routine)		**34.1 h (1.4 d)**	**43.6 h (1.8 d)**	**39.8 h (1.7 d)**	**75.6 h (3.1 d)**
Total inpatient care time = (Inpatient hospitalization length of stay × Inpatient hospitalization rate)		119.0 h (7142.4 min)	146.6 h (8798.4 min)	159.1 h (9547.2 min)	146.9 h (8812.8 min)
Total health care time if hospitalized (nonroutine)		**153.1 h (6.4 d)**	**190.2 h (7.9 d)**	**198.9 h (8.3 d)**	**222.5 h (9.3 d)**

Findings should be interpreted in the context of several limitations. First, three separate samples are presented to generate estimates, which differ by patient characteristics including age and race. For process mapping and patient surveys, we expect differences in parameter estimates to be modest for patients of different clinical and disease characteristics. For the SEER-Medicare analysis, we acknowledge the predominately older adult sample. Estimates from Yabroff and colleagues demonstrate that similar chemotherapy visit rates (8.5 vs 9.0) and slightly higher outpatient/office visit rates (11.1 vs 13.9) are found when comparing patients aged 18-64 and 65 years and older.[4] Given our use of the

SEER-Medicare database to identify rate estimates for the total time calculation, we may overestimate the time spend in clinics for those <65 years of age. However, estimates based on MarketScan data, a sample which includes patients <65 years old, revealed only modest differences. These are national data sets, whereas the patient survey data include two academic medical centers in the Deep South and represent a snapshot of a single visit rather than all time spent over the initial 3-month period. Although patients were on different treatments, we believe that time with physicians is more likely linked to clinic template time availability (eg, 20-minute block for a follow-up visit) rather than patient or treatment characteristics. We assumed in this analysis that patients would receive the services on the same day, which may underestimate time if services were provided on different days. In both claims and observational data, some nononcology care may have been captured. However, this overlap is representative of real-life clinical practices and further highlights a need to coordinate care. We recognize that other patient-specific factors (eg, attitude toward time consciousness, working status), disease-related factors (eg, symptoms from disease), treatment-related factors (eg, length of time for specific infusions), and center-related factors (eg, efficiency of cancer center, availability of home-based resources) are not accounted for in this analysis and could impact individual patient time spent on care. These estimates are intended to guide discussion but should be tailored for individual patients. We also acknowledge that SEER-Medicare codes for secondary metastases are unlikely to be complete and accurate due to lack of association with payment. Thus, this approach to identification of patients with MBC will not fully capture this population. However, we believe that this approach still provides a reasonable estimate of frequency of treatments and health care utilization for patients with breast cancer receiving these common regimens. The data sources are from disparate times and using different methodology due to data availability. However, we anticipate only a minor impact on our estimates due to consistent usage and surveillance of these specific medications over the last decade. Of note, this study does not include novel regimens, such as hormonal blockade with cyclin-dependent kinase 4/6 inhibitors, because these were not approved during the study period. However, based on this methodology, we would anticipate the additional monitoring associated with these regimens would result in time estimates similar to capecitabine, the oral chemotherapy agent modeled in this study. We acknowledge that this study does not account for caregiver time. Finally, our study did not attempt to determine the monetary value of patient time.

Despite limitations, this study provides the important estimates of time spent in the health care system for patients receiving treatment for MBC. Furthermore, this study emphasizes the importance of capturing time using multiple sources, including direct observation and surveys, to obtain first-hand information on patient time in care. The process maps created in this study can be utilized as a framework for future studies examining indirect costs associated with receiving cancer care and easily adapted to meet specific hospital systems. Future work should consider the impact on patient time throughout the MBC disease trajectory, as well as the relationship between patient time spent on MBC treatment and overall survival.

5 | CONCLUSION

Patients with MBC spend 7%-10% of their time on health care in the initial 3 months of treatment, with differences noted by treatment type and method of administration. Travel time and time spent receiving inpatient care represented a substantial time burden to patients. Indirect costs associated with the time spent on health care are not trivial and should be considered when defining value for patients with MBC.

ACKNOWLEDGMENTS

We acknowledge Stevie A. Nappoe, MPH, and the late Dr. Meredith Kilgore for their contributions to this project. This study used the linked SEER-Medicare database. The interpretation and reporting of these data are the sole responsibility of the authors. The authors acknowledge the efforts of the National Cancer Institute; the Office of Research, Development and Information, CMS; Information Management Services (IMS), Inc.; and the Surveillance, Epidemiology, and End Results (SEER) Program tumor registries in the creation of the SEER-Medicare database.

CONFLICT OF INTEREST

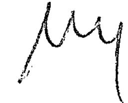
Dr. Rocque received research funding from Pfizer, and Carevive and consulting fees and travel from Genentech and Pfizer unrelated to this manuscript. Dr. Rocque is also supported by an American Cancer Society Mentored Research Scholar Grant (MRSG-17-051-01-PCSM). No other authors have conflicts to declare.

AUTHOR CONTRIBUTIONS

GBR, CPW, STM, KMK, and RDN were involved in conceptualization and design: GBR, CPW, SAI, AA, JYP, KRH, and KMK were involved in formal analysis and investigation. All authors were involved in writing—original draft preparation and writing—review and editing. GBR was involved in funding acquisition. GBR and SAI were involved in resources.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.



ℓ21.16

ORCID

Gabrielle B. Rocque https://orcid.org/0000-0003-4188-9785
Courtney P. Williams https://orcid.org/0000-0001-5328-7517
Stephen T. Mennemeyer https://orcid.org/0000-0002-6039-7965
Ryan D. Nipp https://orcid.org/0000-0002-4577-3248
Katherine E. Reeder-Hayes https://orcid.org/0000-0001-6903-0177
Kelly M. Kenzik https://orcid.org/0000-0002-6402-8446

REFERENCES

1. Zafar SY. Financial toxicity of cancer care: it's time to intervene. *J Natl Cancer Inst*. 2016;108:djv370.
2. Nardi EA, Wolfson JA, Rosen ST, et al. Value, access, and cost of cancer care delivery at academic cancer centers. *J Natl Compr Canc Netw*. 2016;14:837-847.
3. Schnipper LE, Davidson NE, Wollins DS, et al. Updating the American Society of Clinical Oncology Value Framework: revisions and reflections in response to comments received. *J Clin Oncol*. 2016;34:2925-2934.
4. Yabroff KR, Guy GP, Ekwueme DU, et al. Annual patient time costs associated with medical care among cancer survivors in the United States. *Med Care*. 2014;52:594-601.
5. Seabury SA, Frasco MA, van Eijndhoven E, Sison S, Zacker C. The impact of self- and physician-administered cancer treatment on work productivity and healthcare utilization. *Res Social Adm Pharm*. 2018;14:434-440.
6. Yabroff KR, Davis WW, Lamont EB, et al. Patient time costs associated with cancer care. *J Natl Cancer Inst*. 2007;99:14-23.
7. Rocque GB, Rasool A, Williams BR, et al. What is important when making treatment decisions in metastatic breast cancer? A qualitative analysis of decision-making in patients and oncologists. *Oncologist*. 2019;24:1313-1321.
8. National Comprehensive Cancer Network. Invasive breast cancer; 2019. https://www.nccn.org/professionals/physician_gls/pdf/breast.pdf. Accessed 10 July 2019.
9. Rocque GB, Williams CP, Miller HD, et al. Impact of travel time on health care costs and resource use by phase of care for older patients with cancer. *J Clin Oncol*. 2019;37:1935-1945.
10. Community Oncology Alliance. 2016 Community Oncology Alliance practice impact report: closings, hospital acquisitions, and corporate mergers continue to affect nearly 1,600 community oncology practices nationally; 2016. https://communityoncology.org/2016-coa-practice-impact-report/. Accessed October 09, 2012.
11. Bange EM, Doucette A, Gabriel PE, et al. Opportunity costs of receiving palliative chemotherapy for metastatic pancreatic ductal adenocarcinoma. *JCO Oncol Pract*. 2020;16:e678-e687.
12. Celaya MO, Rees JR, Gibson JJ, Riddle BL, Greenberg ER. Travel distance and season of diagnosis affect treatment choices for women with early-stage breast cancer in a predominantly rural population (United States). *Cancer Causes Control*. 2006;17:851-856.
13. Schroen AT, Brenin DR, Kelly MD, Knaus WA, Slingluff Jr CL. Impact of patient distance to radiation therapy on mastectomy use in early-stage breast cancer patients. *J Clin Oncol*. 2005;23:7074-7080.
14. Voti L, Richardson LC, Reis IM, Fleming LE, Mackinnon J, Coebergh JW. Treatment of local breast carcinoma in Florida: the role of the distance to radiation therapy facilities. *Cancer*. 2006;106:201-207.
15. Athas WF, Adams-Cameron M, Hunt WC, Amir-Fazli A, Key CR. Travel distance to radiation therapy and receipt of radiotherapy following breast-conserving surgery. *J Natl Cancer Inst*. 2000;92:269-271.
16. Meden T, St John-Larkin C, Hermes D, Sommerschield S. Relationship between travel distance and utilization of breast cancer treatment in rural northern Michigan. *JAMA*. 2002:287:111.
17. Nattinger AB, Kneusel RT, Hoffmann RG, Gilligan MA. Relationship of distance from a radiotherapy facility and initial breast cancer treatment. *J Natl Cancer Inst*. 2001;93:1344-1346.
18. Boscoe FP, Johnson CJ, Henry KA, et al. Geographic proximity to treatment for early stage breast cancer and likelihood of mastectomy. *Breast*. 2011;20:324-328.
19. Center for Medicare and Medicaid Services. Oncology care model. http://innovation.cms.gov/initiatives/Oncology-Care/. Accessed 16 January 2020

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

How to cite this article: Rocque GB, Williams CP, Ingram SA, et al. Health care-related time costs in patients with metastatic breast cancer. *Cancer Med*. 2020;9:8423–8431. https://doi.org/10.1002/cam4.3461