

Two-Level Personas to Support the Design and Evaluation of Intelligent Health Interfaces

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Abstract

The paper presents the case for using augmented personas (which we call two-level personas) for the design and evaluation of intelligent user interfaces. Two-level personas merge traditional *personas*, a well-known tool for interface design, and *user stereotypes*, a user modeling approach from the area of intelligent user interfaces. Through this unique combination, two-level personas offer a holistic approach to designing and evaluating both the interface and the algorithmic sides of intelligent interfaces. To support our case, we review our experience with two-level personas in designing and evaluating an intelligent information system for cancer patients.

Keywords

Health Information Access, Human-Computer Interaction, User Modeling, User Study

1. Introduction

Designing intelligent interfaces (IUI) is a special challenge due to their dual nature: a combination of a state-of-the-art interface with advanced AI-based algorithms powering it behind the scenes. For each of these two components, the interface and algorithms, multiple design and evaluation approaches have been developed, which are now taught in handbooks, textbooks, and tutorials [1, 2, 3, 4, 5]. However, there are very few approaches specifically developed to support the design of IUI in which these components must be developed in parallel and in coordination with each other [6, 7, 8]. In this paper, we suggest a design and evaluation approach for intelligent interfaces that could assist in coordinating the development of the interface and algorithmic components of IUI. The idea of these approaches is to combine two powerful techniques from the areas of interface design and personalization - personas and stereotype user modeling. Personas are well-recognized tools for the design and early evaluation of user interfaces [9]. User stereotypes [10] are a classic approach to representing users in intelligent and personalized systems, which has been explored in many domains. While these approaches come from different worlds - the former from the world of interfaces and the latter from the world of algorithms - they are essentially two formalisms in which these two worlds represent stereotypical users in interactive and intelligent systems.

The idea of our approach, which we call *two-level personas*, is to augment traditional interface design personas with a formal, algorithm-oriented level, representing the user stereotype corresponding to the persona. In these two-level personas, the traditional design persona with a photo, name, personality, etc. forms the upper visible layer to be used by the interface design team in design and evaluation of the interface component. The user stereotype, representing essential features of a specific stereotypical

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user in an algorithmically-accessible way forms the bottom hidden layer that can be used for the design and evaluation of system algorithms.

In this paper, we present our experience using two-level personas for the development and evaluation of a health-oriented IUI (an interactive recommender system for cancer patients), where this approach offers an additional advantage: early user-centered evaluation. User-centered evaluation is now a recognized approach in evaluating interactive intelligent systems [11, 12] and the proponents of “Human-Centered AI” [13] argue for applying user-centered approaches for the design and evaluation of all kinds of intelligent systems. However, user-centered evaluation with real users is a known challenge in the domain of health IUI. The target users of health-oriented IUI are often patients with serious medical conditions (such as cancer patients) who have no time and energy to participate in traditional iterative design and evaluation. At most, these users could be involved in the final evaluation stage when the system is ready. However, user-centered evaluation is crucial in the early stage of design to ensure that the system can adequately handle the needs of the most important user groups. As our work shows, two-level personas can support user-centered evaluation in much earlier stages of system design, just as traditional personas support early stage design and evaluation of regular interfaces [9]. This paper is not a research study, but a research experience summarized for productive discussion. We believe that a discussion focused on more advanced personas in the design and evaluation of intelligent interfaces is long overdue, and we hope that our paper will help initiate it.

2. Related Work

2.1. Personas in Design

First introduced by Cooper et al. [9] in the field of interface design, personas can represent stereotypical users that encapsulate key attributes and characteristics of the primary user groups for whom the system is being developed. Each persona should be a *believable* lifelike character, complete with a photo, name, demographic information, and other necessary data for interface design. It should be sufficiently realistic for the design team to use it as a representation of the real user when discussing, designing, and assessing interface prototypes. In less than 5 years from its appearance, personas became one of the most popular tools in interface design, with their use advocated and explained in multiple textbooks and tutorials for interface designers.

2.2. User Stereotypes for Intelligent Interfaces

Stereotypical user modeling, one of the earliest approaches to user modeling, was first introduced by Elaine Rich [10] and was extensively applied in many early user-adaptive systems [14]. This approach clusters users of a personalized system into several groups, or stereotypes, based on shared needs for adaptation. For personalization purposes, each user is assigned to a specific stereotype, and the adaptation mechanisms treat all users within the same stereotype in the same way (i.e., in a recommender system, users within the same stereotype would receive identical recommendations). In the classic version of *stereotype-based* modeling used in early personalized systems, stereotypes were essentially labels with no internal content directly used for personalization. With these labels, user modeling was performed by observing *trigger events*, which indicate the user transition from one stereotype to another. In modern *feature-based* user modeling (where a user is represented as a set of feature values), each stereotype includes a full set of user features, and their main role is supporting cold-start personalization where little to none is known about a user. In this situation, matching a user to the closest stereotype enables full-scale personalization in the early stages of work. Once the system collects more information about an individual user, stereotype-based modeling is gradually replaced by a feature-based modeling.

3. Two-Level Personas for the Design of HELPeR

3.1. A Recommender System for Cancer Patients

Ovarian cancer (OvCa) remains the deadliest gynecologic malignancy in the United States, accounting for more deaths than any other cancer of the female reproductive system. Due to the aggressive and often late-diagnosed nature of the disease, both OvCa patients and their caregivers experience dynamic and multifaceted information needs that span medical, psychosocial, emotional, and practical domains. Online health information plays a critical role in addressing these needs, providing timely access to a wide range of resources that supplement clinical care. However, existing digital platforms often fall short due to limited OvCa-specific content, inconsistent quality, and a lack of personalized recommendations that reflect the unique contexts of users. A growing body of research highlights the critical importance of tailored information delivery in improving health outcomes and reducing distress among patients and caregivers navigating complex cancer trajectories. Recommender systems (RS) have emerged as promising tools in healthcare to deliver targeted content based on user preferences and behaviors.

Our work on *HELPeR* (Health E-Librarian with Personalized Recommendations), focusing on developing an interactive recommender system for *OvCa* patients and caregivers, which can offer them personalized access to a curated collection of online documents related to *OvCa*. The goal of *HELPeR* was to offer a multi-aspect personalization that considers the state of health, the needs, interests, and the level of knowledge of individual patients, *HELPeR* offers personalized recommendations on topics such as diagnosis, treatment, management of symptoms and emotional support. The design and development of a recommender system for cancer patients and caregivers is a special challenge. On the one hand, it is really hard for the design team members to fully understand the prospects and preferences of those dealing with the disease. On the other hand, a traditional user-centered design process based on significant engagement of the target users can't be applied due to patients' health status and overload of their caregivers. In our work, we addressed these challenges in two ways. First, we informed our design using data from an online community of *OvCa* patients to perform an extensive analysis of their information needs and knowledge. Second, we developed the system interface and algorithms following an iterative design approach through a sequence of increasingly more advanced prototypes and by engaging users who are progressively closer to our target cohort in evaluating the product of each design iteration.

To support our iterative design process, we developed several “augmented personas” to represent the key target groups of *HELPeR* users. By combining the concepts of personas and stereotypes, each augmented persona captured the essential attributes and characteristics of a user group, such as demography, disease trajectory, and information needs. For interface design purposes, these attributes were visualized as an information card for system designers, complete with name and photograph. To function as a stereotype, these attributes were represented as a user profile that could be utilized by personalization algorithms to generate tailored recommendations. This “hidden side” of the persona allowed its use for the design and evaluation of algorithms by simulating diverse patient and caregiver scenarios avoiding the use of sensitive personal data.

4. Data-Driven Development of Personas

4.1. Data Source

The practice of persona development in the user-centered design process stresses that personas must be designed on the basis of extensive analysis of target users of an interactive system [9]. This is even more important for the design of two-level personas where the lower level of personas is directly used by algorithms.

As a source of data about *OvCa* patients and caregivers we used the National Ovarian Cancer Coalition (NOCC) online forum. The NOCC forum, a sub-community of the Cancer Connect Community¹,

¹<https://ovarian.org/get-involved/nocc-communities/>

connects *OvCa* survivors and caregivers by providing a patient-oriented space where users initiate *threads* to ask questions, share experiences, or seek second opinions, with responses often coming from fellow survivors, caregivers, or community moderators. We used this forum as a primary source for our user studies due to two unique properties: (1) its commitment to *OvCa*, ensuring that discussions are highly relevant to *OvCa*; and (2) its role in fostering a supportive environment where patients can freely share personal experiences [15].

We collected a dataset spanning June 2010 to December 2020, including thread titles, initial post content, poster names, comments (responses to posts), comment authors, likes on posts and comments, users who liked posts or comments, and timestamps. In total, 909 *OvCa* discussion threads were collected, comprising 909 initial posts and 14,816 comments. Of these, 560 initial posts included an articulated question and 457 posts were written by users who contributed at least three posts. A detailed exploratory analysis of this forum can be found in our two recent studies [16, 17]. The first study [16] examined resource sharing behaviors in the NOCC forum, revealing that only half of the shared resources were highly relevant to the needs of users. The second study [17] analyzed user questions, finding that while most inquiries focused on basic understanding or practical advice, a smaller subset sought more personalized guidance or insights based on shared experiences.

4.2. User Clustering

OvCa patients and caregivers exhibit diverse information needs, shaped by the distinct stages of their disease and personal circumstances [18, 19]. The ability to connect user needs with their personal information and condition could help a HRS to generate useful recommendations for new HRS users. To establish these connections, this study attempted a cluster analysis of NOCC forum users.

The analysis focused on users who contributed at least three posts in the NOCC forum to ensure a meaningful engagement threshold, resulting in a dataset of 457 posts from 60 unique users. To build a clinically relevant dataset, a group of experts met to discuss possible variables, their clinical importance, and their relevance to differentiating between patients and caregivers. This collaborative effort ensured a consistent annotation framework informed by real-world clinical experience. Regular calibration sessions among annotators further ensured uniformity and reliability. Then, three nursing students manually annotated each user’s posts with values for the features listed below. The values of demographic and health features are listed in Table 1. The values for all information need features were Yes or No.

- Health Information: *User Role, Cancer State and Disease Trajectory*
- Demographic Information: *Age, Marital Status, Employment, presence of children, caregiver, and insurance.*
- Information Needs: *Disease Management Needs, Symptom Needs, Emotional Needs, Self-management Needs, Treatment Needs, Financial Needs and Sexuality Needs.*

Table 1

The values of demographic and health-related clustering features. All features are categorical.

Feature Names	Possible Values
User Type	Patient or Caregiver
Has Kids, Has Caregiver, Has Insurance, Employed	Yes or No
Age	Above 50 or Below 50
Marital Status	Married, Separated, Divorced, Widowed
Cancer Stage	Early or Advanced
Disease Trajectory	Initial Diagnosis, Remission, Treatment/Progression, End of Life

We used k-modes clustering [20], a method well-suited for analyzing categorical data, to identify patterns in the dataset. Key variables, such as user roles, disease trajectories, and information needs,

guided the clustering process. The silhouette method [21] was applied to determine the optimal number of groups, ensuring meaningful and interpretable clusters. The analysis yielded six clusters. One cluster, primarily composed of records with numerous missing or unknown parameters, was excluded from further analysis due to its limited interpretive value. The remaining five clusters revealed five meaningful subgroups, each reflecting distinct behavioral patterns and information needs:

- **Cluster 1:** *Patients with an initial diagnosis:* These users primarily seek foundational information and emotional reassurance to navigate the uncertainty of their diagnosis.
- **Cluster 2:** *Patients in treatment/progression with emotional needs:* Emotional support dominates this group's priorities, along with actionable advice for managing treatment-related symptoms.
- **Cluster 3:** *Patients in treatment/progression with disease management needs:* This subgroup focuses on obtaining practical guidance for symptom relief and navigating complex treatment regimens.
- **Cluster 4:** *Patients in remission with symptom management needs:* These users require targeted resources to address lingering or recurring symptoms post-treatment.
- **Cluster 5:** *Patients in remission with self-management needs:* This group focuses on long-term well-being, lifestyle adjustments, and preventive care strategies.

4.3. Creating the Personas

Cluster analysis allowed us to identify five distinct user cohorts that reflected significant variations in user demographics, disease trajectories, and information needs of *OvCa* patients. To turn these clusters into stereotypes, each cluster was analyzed to extract the most frequently occurring feature values for key attributes, such as age range, disease stage, and user needs (e.g., emotional support, disease management, treatment, and symptom management). These aggregated values encapsulated the predominant characteristics of the users within that group. For example, a cluster dominated by patients in active treatment with emotional support needs produced a user stereotype emphasizing these attributes. With this approach, we formed the bottom level of our two-level personas that can be directly used by our personalization algorithms.



Figure 1: Two-level personas Olivia, Lucy, and Angela. Each persona represents a hypothetical patient embodying a stereotype of the population at distinct phases of treatment. All patient images are generated using the Fake Image Generator website (thispersondoesnotexist.com), ensuring privacy and realism in the visual depiction.

To form the upper level of these personas, i.e., creating realistic, lifelike patient personas that humans can use in the design and evaluation process, we collaborated with three experienced oncology nurses. These domain experts reviewed the initial stereotypes and enriched each with a detailed profile that included a name, a photograph, demographic details, disease trajectory, and specific information needs. By grounding each persona in their clinical expertise and understanding of real-world patient populations, nurses ensured that the personas were both clinically valid and representative. Through this iterative process, we developed a total of five two-level personas, each corresponding to one of the

identified clusters. Figure 1 shows the information cards (i.e., visible side) of three (out of five) personas created during the first iterations of our design process. These stereotypes were used in the early-stage design and evaluation of *HELPeR* interfaces and algorithms. The results of this early-stage design could be found in [22].

5. Iterative Improvement of Personas

5.1. Refining Personas

To perform the evaluation of our early version of *HELPeR* interface and algorithms, we performed a user study which engaged a range of nurse professionals, from nursing students to senior nurses with cancer experience. We selected nurse professionals as the most accessible type of surrogate users and by engaging two-level personas, we were able to perform a very close approximation of a study with real users. In this study, the nurses were given a visual representation (the upper level) of one of our personas and were asked to evaluate the content and the presentation of recommendations generated for this persona by our personalization algorithms by using data from the lower level of the same persona. While this user study allowed us to collect valuable insights for the next design iteration, the nurses engaged in our study pointed out that the amount of information about each persona is too limited to reliably assess whether a specific recommendation is a match to her needs. Indeed, as shown in Figure 1, early personas such as "Olivia" included only a limited set of attributes such as age, marital status, disease stage, and general needs. To prepare for the next design iteration, we enriched both levels of persona representations. Our refinement process aimed to improve the diversity of patient profiles based on trajectories, incorporate caregiver perspectives, and respond to expert feedback. We found that online forums, while informative, do not represent the full spectrum of *OvCa* patients. To develop more realistic personas, we synthesized information from multiple sources, including interview transcripts with study patients and caregivers, clinical notes, and insights from expert nurses.

The result was a set of 10 comprehensive personas: seven *OvCa* patients (aged 42–65) and three caregivers (aged 45–79). These personas better reflected a wide range of professional backgrounds, caregiving roles, and disease trajectories using the following enhancements:

- Expanded narratives: Capturing the emotional and practical challenges of users to provide a more holistic understanding.
- Specific contextual details: Incorporating caregiving responsibilities, disease stages, and current medical situations to ground the personas in realistic scenarios.
- Explicit articulation of needs: Clearly defining user requirements to enable better simulation of behavior and information-seeking patterns.

Figure 2 highlights the evolution of personas, providing richer and more actionable profiles. These refined personas include detailed information such as caregiving roles, symptom management needs, and challenges related to long-term care planning. More examples of the refined personas can be found in the Appendix A.

5.2. Finalizing Personas

We used enhanced personas for a focused evaluation of *HELPeR* personalization algorithms that have been refined based on the results of the earlier study. The evaluation approach was similar to our early studies. The professional nurses involved in the study were requested to assess the quality of the first-round recommendations generated for a given persona. Nurses received persona information cards representing the upper level of persona. The recommendations were generated by using the data from the lower level of persona's representation. For this study, we engaged only experienced senior nurses, as our previous studies demonstrated that they can provide a more grounded and reliable assessment of the match between user needs and specific recommended documents. The nurses appreciated the quality of the refined personas, but were not completely satisfied with it.



Name	Nadia - sister-in-law primary support
Profession	Housekeeper at local hotel (not working currently)
Marital Status	Unmarried
Nadia's Age	55 (55 when diagnosed)
Cancer Stage @ Diagnosis	Stage IVB low grade serous carcinoma of the ovary
Current Disease Trajectory State	Just completed initial treatment (neoadjuvant chemotherapy & surgery) (survivorship after treatment)
Current Disease State	hopeful for remission
Nadia's all Needs	hormonal maintenance therapy, managing cost of cancer care, financial assistance

Nadia is a 55 y.o. single woman who is an immigrant from Eastern Europe. She has not been able to work since surgery, but hoping to return as soon as possible. She has just completed her initial treatment for Stage IVB low grade serous carcinoma of the ovary. She received 4 cycles of neoadjuvant carboplatin and paclitaxel followed by optimal interval debulking surgery and 3 cycles of adjuvant chemotherapy. Most recent CT scan shows no clear cut intraperitoneal disease, but she does have residual but slightly decreased chest adenopathy. Dr. suspects she does have residual chest disease, but patient is trying to remain hopeful. Physician recommends she begin hormonal maintenance therapy (Letrozole 2.5 mg daily). Nadia wants to learn more about maintenance therapy and also expresses concern about her current medical bills, costs of the letrozole, and any financial support that might be available for her.

(a) Persona: Nadia



Name	Susan -
Profession	Retired teacher
Marital Status	Married
Children	4 Children 8 grandchildren
Susan's Age	65 (60 when diagnosed)
Current Disease Trajectory State	on treatment (Doxil) for 3rd recurrence (recurrence)
Current Disease State	stable disease of Doxil
Susan's all Needs	symptom management, sleep problems, mouth sores, hot flashes, chronic pain

Susan is a 65 y.o. married with 4 children and 8 grandchildren. She was diagnosed at age 60 and has had 3 recurrences since then. She is currently on Doxil and doing very well. Her cancer is stable. She knows that it will not cure her, but she and her doctor are hopeful that it will keep the cancer under control and allow her to live a high quality life for as long as possible. She is interested in learning more about how to manage the symptoms she experiences: Sleep problems, mouth sores (mucositis), hot flashes and chronic pain. Currently, she is on basic pain killers but is actively seeking better techniques and approaches to further alleviate her discomfort and improve her overall quality of life.

(b) Persona: Lucy

Figure 2: Refined personas developed in the second iteration of persona design. The photos are generated using the Fake Image Generator website (thispersondoesnotexist.com), ensuring privacy and realism in the visual depiction.

For example, the initial version of Jennifer's persona included the statement: *"The chemo nurses have been pushing her to ask for a referral to physical therapy or some kind of rehabilitation, but she has been so tired she couldn't face it. Now that she can see the light at the end of the tunnel, she wants to see what other people's experiences have been with PT or rehab for peripheral neuropathy."* Experts noted that phrases such as "light at the end of the tunnel" and "she couldn't face it" were vague and lacked actionable details, making it difficult to infer precise information needs. To address this, Jennifer's persona was revised to include clearer timelines and more explicit connections between her symptoms, treatment suggestions, and information needs: *"Based on all the symptoms Jennifer had, her chemo nurses highly suggested her to have either physical therapy or some kind of rehabilitation. However, she has been so tired that she couldn't face it. Today is her next-to-last cycle of chemotherapy. Now that she can see the light at the end of the tunnel, she wants to see what other people's experiences have been with PT or rehab for peripheral neuropathy."*

Following this feedback, we performed another refinement of our personas. This revision provided a more precise context, reduced ambiguity, and ensured better alignment with expert expectations. In addition, visual updates were made to enhance their perceived authenticity. Updated profile photos ensured that visual elements, such as appearance and demographic characteristics, aligned with the persona's narratives, making them more realistic and relatable during evaluations. These personas were found to be fully satisfactory and were used in our final design and iteration efforts. In particular, they were found to be more effective in simulating diverse user profiles and enhancing the accuracy of HELPeR evaluations.

6. Conclusion

In this paper, we present the idea of two-level personas for the design and evaluation of IUI and share our experience in using personas in the design of *HELPeR*, an interactive recommender system for cancer patients. Our work on *HELPeR* demonstrated the value of two-level personas in the design process and gave us confidence to recommend this approach to similar design cases.

In reviewing our shared experience with the development and application of two-level personas, we would like to stress two important aspects. First, to make a representative set of personas, their design has to be driven by the analysis of the target user community, which is critical to form a comprehensive set of personas that represent the most essential user types. Second, just as other design artifacts - interface prototypes, and algorithms - personas have to be gradually improved and refined in the design process following the result of persona-enabled user studies. This feedback-driven refinement will ensure that richer and refined personas can support the design and evaluation of more advanced versions of the interface and algorithms. Based on our experience with *HELPeR*, we plan to use two-level personas in our future work.

Although the work presented in the article was performed as part of a research project, the article itself is not written as a study but rather as an experience report presented for discussion. We recognize that our execution of the two-level persona approach has its limitations, but we hope that a discussion will help to reveal both, strong and weak sides of the presented approach and motivate further research on more advanced personas in IUI.

7. Ethical Considerations

All studies reviewed in this paper received Institutional Review Board approval to ensure compliance with ethical standards. The collected data were anonymized, and all expert feedback was securely stored to protect confidentiality.

8. Declaration on Generative AI

During the preparation of this work, the authors used ChatGPT and Grammarly for grammar and spelling checks, proofreading, and limited paraphrasing/rewording. The authors also used synthetic image generation tools to create persona photographs for privacy purposes. These images do not depict real patients, caregivers, study participants, or forum users. No AI tools were used to design or conduct the research, analyze the data, generate the scientific results, or develop the substantive scientific content of the paper. After using these tools/services, the authors reviewed and edited the content as needed and take full responsibility for the publication's content.

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A. Examples of refined personas used

Table 2

Persona: Susan

Field	Value
User Type	Patient
Age at Diagnosis	60
Current Age	65
Caregiver	None
Profession Status	Retired teacher
Marital Status	Married
Children	4
Grandchildren	8
Trajectory	Recurrence
Recurrences	3
Trajectory Details	On treatment (Doxil) for 3rd recurrence
Disease Status	Stable disease on Doxil
Needs	symptom management; sleep problems; mouth sores; hot flashes
Summary	Susan is a 65 y.o. married with 4 children and 8 grandchildren. She was diagnosed at age 60 and has had 3 recurrences since then. She is currently on Doxil and doing very well. Her cancer is stable. She knows that it will not cure her, but she and her doctor are hopeful that it will keep the cancer under control and allow her to live a high quality life for as long as possible. She is interested in learning more about how to manage the symptoms she experiences: sleep problems, mouth sores (mucositis), and hot flashes.

Table 3

Persona: Jennifer

Field	Value
User Type	Patient
Age at Diagnosis	57
Current Age	57
Caregiver	None
Profession Status	Radiology technician
Marital Status	Single
Children	0
Trajectory	Survivorship
Trajectory Details	On chemo after initial diagnosis
Disease Status	No evidence of disease (NED)
Stage at Diagnosis	Stage IIIb
Needs	management of peripheral neuropathy; physical therapy; rehabilitation
Summary	Jennifer is a 57 y.o. who was diagnosed with ovarian cancer (Stage III-c clear cell) 3 months ago. She had sub-optimal debulking during surgery (with removal of a 40 cm tumor) but her last CT scan showed no evidence of disease and her Ca-125 is now in the normal range (14) from a high pre-surgery of 1372. Unfortunately, she developed severe peripheral neuropathy and the MD switched her to Taxotere at Cycle #3. She has had several falls and is now using a walker. She has gained 30 pounds and is hardly able to tolerate walks to the mailbox she is so deconditioned. Today is her next-to-last cycle of chemotherapy. The chemo nurses have been pushing her to ask for a referral to physical therapy or some kind of rehabilitation, but she has been so tired she couldn't face it.

Table 4

Persona: Nadia

Field	Value
User Type	Patient
Age at Diagnosis	55
Current Age	55
Caregiver	Sister-in-law
Profession Status	Housekeeper at local hotel (not working currently)
Marital Status	Single
Children	0
Trajectory	Survivorship after treatment
Trajectory Details	Just completed initial treatment (neoadjuvant chemotherapy and surgery)
Disease Status	Hopeful for remission
Stage at Diagnosis	Stage IVB low grade serous carcinoma of the ovary
Needs	hormonal maintenance therapy; managing cost of cancer care; financial assistance
Summary	Nadia is a 55 y.o. single woman who is an immigrant from Eastern Europe. She has not been able to work since surgery, but hoping to return as soon as possible. She has just completed her initial treatment for Stage IVB low grade serous carcinoma of the ovary. She received 4 cycles of neoadjuvant carboplatin and paclitaxel followed by optimal interval debulking surgery and 3 cycles of adjuvant chemotherapy. Most recent CT scan shows no clear cut intraperitoneal disease, but she does have residual but slightly decreased chest adenopathy. Dr. suspects she does have residual chest disease, but the patient is trying to remain hopeful. Her physician recommends she begin hormonal maintenance therapy (letrozole 2.5 mg daily). Nadia wants to learn more about maintenance therapy and also expresses concern about her current medical bills, costs of the letrozole, and any financial support that might be available for her.

Table 5

Persona: Maria

Field	Value
User Type	Patient
Age at Diagnosis	55
Current Age	58
Caregiver	None
Profession Status	Administrative assistant (currently stopped working)
Marital Status	Married
Children	2
Trajectory	Survivorship for progression/recurrence
Trajectory Details	Taxol plus Avastin for 4th recurrence; life-threatening reaction to carboplatin
Disease Status	Disease is progressing (CA-125 rising)
Needs	drug side effect management; fatigue
Summary	Maria is a 58 y.o. married woman with 2 adult daughters. She was diagnosed 3 years ago at age 55 and has had 4 recurrences since then. She has been on Taxol plus Avastin, but yesterday was taken off Avastin for "too much protein in her urine." She is worried because the CA-125 yesterday jumped from 284 to 379. She is also desperate for something to help her fatigue. It is the one symptom she can't control. She is too tired to do normal house cleaning, crafts, going out to shop, and much of anything she used to participate in. She continues to need more sleep and sometimes frequent naps. She gets depressed when she can't do what she wants to do. She feels that she has a good quality of life, and living after 3 1/2 years is a big deal to her. She wishes she could better control and improve this fatigue.

Table 6

Persona: John

Field	Value
User Type	Caregiver
Current Age	77
Patient's Age	79
Relationship with Patient	Husband
Profession Status	Retired
Marital Status	Married
Trajectory	Initial diagnosis
Trajectory Details	New diagnosis
Disease Status	Large visible tumor on scans; concern for metastatic disease
Stage at Diagnosis	"Advanced" newly diagnosed; waiting for surgery and staging
Needs	communication with children and grandchildren; spiritual support; emotional support
Summary	John has joined the forum for the first time. He is 77 y.o., retired, with 1 adult daughter who has 4 children between the ages of 3 and 18. They are very close. John's wife, Catherine, has been complaining of feeling bloated and feeling "full" after very small meals for the past couple of months. John and his wife just had their first appointment with the gynecologic oncologist after a CT scan ordered by their primary care provider showed concern for advanced ovarian cancer, which was confirmed with a biopsy. Based on the CT imaging, the physician thought it would be reasonable to start with surgery, which has been scheduled for 11/30/2021. The doctor was very honest about her concern that the cancer had spread (was metastatic) and what impact that would have on Catherine's prognosis. John is trying to stay optimistic for Catherine, but he is overwhelmed emotionally at the thought of losing her.

Table 7

Persona: Julio

Field	Value
User Type	Caregiver
Current Age	72
Patient's Age	n/a
Relationship with Patient	Husband
Profession Status	Retired
Marital Status	Married
Trajectory	Survivorship for progression/recurrence
Trajectory Details	Recurrent cancer (with rapid progression)
Disease Status	Carcinomatosis with ascites; physicians recommending hospice
Stage at Diagnosis	Stage III
Needs	communication with children and grandchildren; spiritual support; emotional support
Summary	Patient is a 72-year-old married woman with a history of hypertension, ovarian cancer, ascites, and recent paracentesis, who presents today with sudden-onset recurrent ascites, abdominal pain, decreased oral output, and decreased oral intake. She is known to have a history of thrombocytopenia and is here for urgent evaluation and expedited paracentesis when it is medically feasible. The physician has a frank conversation with Julio about rapid disease progression, lack of further treatment options, and recommends hospice to provide comfort to Juanita and support to Julio. Julio is now looking for information on hospice and what to expect at end-of-life, and what it means to choose "comfort measures only."