

Using Visual Aids to Improve Communication in Oncology Consultations

S. Moore-Davis¹, M. Keane¹, S. Blazkova¹, S. Chew^{1,2}.

1. Department of Medical Oncology, University Hospital Galway, Newcastle Rd., Galway City, Co. Galway, Ireland.
2. School of Medicine, University of Galway, University Rd., Co. Galway, Ireland.

Abstract

Aim

To evaluate the impact of visual aids on patient understanding, recall and communication during oncology consultations.

Methods

This single-centre prospective observational study was conducted at Portiuncula University Hospital. Visual aids were introduced into oncology consultations from 1/7/2024. Patients receiving systemic anti-cancer therapy (SACT) at the oncology day ward between 1/9/2024 and 1/11/2024 completed anonymous questionnaires using 5-point Likert scales. Descriptive statistical analysis was performed using Microsoft Excel.

Results

Of 50 questionnaires distributed, 27 were completed (54%). 8 patients (29.6%) received visual aids and 19 (70.4%) had standard consultations. Median age was 66 years (range 37–80). 18 (66.7%) were female. The most common tumour types were gastrointestinal (16 [59.3%]), breast (6 [22.2%]) and lung (2 [7.4%]). 22 patients (81.5%) attended with a companion. Cancer stage awareness was reported as early, metastatic or unsure as 5 (18.5%), 8 (29.6%), and 14 (51.9%) respectively. Correct identification of cancer stage was higher with visual aids (5 [62.5%] vs 8 [42.1%]). 7 visual aid-users (87.5%) reported improved recall of the conversation and treatment schedule. 6 visual aid-users (75.0%) reported improved communication with those not present, while 17 non-users (89.5%) reported anticipated benefit. 17 non-users (89.5%) anticipated improved recall. Overwhelm was lower with visual aid-users (3 [37.5%] vs 14 [73.7%]).

Discussion

Visual aids improved patient-reported understanding, recall and communication while reducing information overload, supporting integration into routine oncology practice.

Introduction

Effective communication is a cornerstone of high-quality oncology care, underpinning patient understanding, shared decision-making and treatment adherence. However, communication in oncology consultations is often challenging due to the volume, complexity, and emotional burden of the information discussed. Medical terminology may be difficult for patients to understand, and clinicians frequently overestimate patients' health literacy and their capacity to process and retain information during consultations.^{1,2} These challenges are further compounded by the psychological distress associated with a cancer diagnosis, which has been shown to impair attention, comprehension and memory, particularly during discussions involving prognosis and treatment options.³

Patient recall of medical information after consultations is frequently limited. Patients may forget between 40% and 80% of information provided during medical consultations.⁴ Poor recall has been associated with adverse outcomes, including reduced satisfaction with consultations and lower adherence to treatment recommendations.⁵ These findings highlight the need for strategies that enhance communication, support memory, and improve patient understanding in routine oncology clinical practice.

Visual aids have been proposed as an effective adjunct to verbal communication. These have the potential to simplify complex information. Diagrams and images have been shown to improve comprehension, attention, and information retention across a range of healthcare settings.^{6,7} Recent systematic reviews have demonstrated that visual-based interventions improve understanding of cancer-related information and health literacy, further supporting their use as adjuncts to verbal communication.^{8,9} In oncology, visual tools such as treatment timelines may help patients understand their diagnosis, treatment intent, and clinical course.¹⁰ Despite their potential, their use in routine oncology consultations remains limited, and there is a lack of real-world evidence evaluating their impact.

This study aimed to evaluate the impact of visual aids, as an adjunct to standard verbal communication, during oncology consultations, assessing their impact on patient understanding, recall, and communication.

Methods

A set of visual aids were developed as a potential tool to support communication during oncology consultations. These visual aids were introduced into medical oncology outpatient clinics in Portiuncula University Hospital from 1st July 2024. These were used during initial consultations for newly diagnosed breast cancer patients and during consultations involving changes to systemic therapy across multiple tumour types. These included printed, clinician-guided diagrams illustrating key concepts related to cancer diagnosis, staging and treatment in a simplified format. Materials for breast cancer patients included images of dandelions at different stages of their lifecycle to illustrate progression from early to advanced cancer and a dandelion seed analogy in which individual filaments represented tumour receptors (oestrogen receptor, progesterone receptor, and HER2 status). Anatomical diagrams of the breast were used to demonstrate tumour origin, including ducts and lobules, aiding explanation of cancer subtype. In addition, colour-coded timelines of chemotherapy regimens were developed to depict treatment cycles and overall duration, enabling patients to follow their treatment pathway visually. A further visual aid was developed to explain the mechanisms and roles of common cancer treatment modalities, including chemotherapy, targeted therapy, hormone therapy, radiotherapy, immunotherapy, surgery and clinical trials. Examples of the visual aids used in this study are provided in Appendix 1.

Two structured questionnaires were developed to assess the impact of the visual aids. One questionnaire was developed for patients who had received visual aids during consultations to determine their satisfaction with the intervention. For those whose treatment had begun before the visual aids were integrated, we developed another questionnaire to assess their perceived benefit. Both questionnaires included images of the visual aids and used 5-point Likert scales to assess parallel domains, including information processing, recall, communication, and understanding of their treatment schedules. An example of a patient questionnaire used in this study is provided in Appendix 2.

Patients receiving systemic therapy at the Portiuncula University Hospital oncology day ward were recruited consecutively between 1st September and 30th November 2024 and were invited to complete a voluntary, anonymous questionnaire following their consultation.

The questionnaires assessed patient-reported satisfaction with the amount of information discussed during the consultation, their understanding of their diagnosis, treatment intent, recall of information discussed during the consultation and ease of communication with others about their diagnosis. Responses were recorded using Likert-scale measures, with the option for patients to write additional comments. Demographic and clinical data, including age, sex, tumour type, education level, and attendance with or without a

companion, were collected. Patient-reported awareness of cancer stage and treatment goals was also assessed.

Descriptive statistical analysis was performed using Microsoft Excel. Categorical variables were summarised as frequencies and percentages. Comparisons between groups were performed descriptively.

Ethical approval was obtained from the Galway Clinical Research Ethics Committee. Reference number: C.A. 3299. Participation was voluntary and responses were collected anonymously with completion of the questionnaire taken to imply consent.

Results

Patient Characteristics

50 questionnaires were distributed, of which 27 were completed (54% response rate). 8 patients (29.6%) received visual aids during their consultation and 19 (70.4%) had standard consultations. The median age was 66 years (range 37–80), with 18 female (66.7%) and 9 male (33.3%) participants. 100% were White (Irish) with English as their first language. The tumour types of the participants included gastrointestinal (59.3%, n=16), breast (22.2%, n=6), lung (7.4%, n=2) and other (11.2%, n=3). Educational attainment was reported as primary level in 18.5% (n=5), secondary in 48.1% (n=13) and tertiary in 33.3% (n=9) of patients. The majority of patients (81.5%, n=22) attended consultations with a companion, while 18.5% (n=5) attended alone.

Table 1. Patient Characteristics

Characteristic	Visual Aid Users (N=8)	Visual Aid Non-users (N=19)	All patients (N=27)
Median age, years (range)	68 (49-79)	62 (37-80)	66 (37-80)
Sex			
Male	0 (0%)	9 (47.4%)	9 (33.3%)
Female	8 (100%)	10 (52.6%)	18 (66.7%)
Ethnicity			
White (Irish)	8 (100%)	19 (100%)	27 (100%)
Education level			
Primary	2 (25%)	3 (15.8%)	5 (18.5%)
Secondary	5 (62.5%)	8 (42.1%)	13 (48.1%)
Tertiary	1 (12.5%)	8 (42.1%)	9 (33.3%)
Cancer stage			
Early	3 (37.5%)	2 (10.5%)	5 (18.5%)
Metastatic	2 (25%)	6 (31.6%)	8 (29.6%)
Unsure	3 (37.5%)	11 (57.9%)	14 (51.9%)
Cancer type			
Gastrointestinal	4 (50%)	12 (63.2%)	16 (59.3%)
Breast	3 (37.5%)	3 (15.8%)	6 (22.2%)
Lung	0 (0%)	2 (10.5%)	2 (7.4%)
Other	1 (12.5%)	2 (10.5%)	3 (11.1%)
Language			
English	8 (100%)	19 (100%)	27 (100%)
Attended with a companion			
Yes	7 (87.5%)	15 (78.9%)	22 (81.5%)
No	1 (12.5%)	4 (21.1%)	5 (18.5%)

Awareness of Cancer Stage and Treatment Goals

Patient-reported awareness of cancer stage was variable. 18.5% identified early-stage disease, 29.6% metastatic disease, and 51.9% were unsure of their cancer stage. Correct identification of cancer stage and treatment goals was higher among patients receiving visual aids compared to those who did not (62.5% vs 42.1%). Interestingly, lower educational attainment was associated with reduced awareness of cancer stage and

treatment intent. 66.7% of patients with third-level education correctly identified their cancer stage compared to 38.9% of patients that completed only primary or secondary level education. Visual aids may help bridge this gap.

Patient Understanding, Recall, and Communication

Among patients who received visual aids, 87.5% reported improved recall of information discussed and improved recall of treatment schedules. Additionally, 75% reported improved ability to communicate information to family or friends not present during the consultation. Visual aids were also reported to be easy to understand and helpful in maintaining attention during consultations in 87.5% of users.

Among patients who did not receive visual aids, 89.5% believed that visual aids would improve recall of information discussed during the consultation and understanding of their treatment schedules. Additionally, 89.5% anticipated their benefit as a communication tool for communicating with family or friends not present during the consultation about their diagnosis. 100% of the patients who attended the consultation alone anticipated that visual aids would facilitate communication with those not present.

Perceived Information Load

Patients receiving visual aids were less likely to report feeling overwhelmed with the amount of information discussed during the consultation compared to those who did not (37.5% vs 73.7%).

Table 2. Patient Understanding, Recall, Communication and Perceived Information Load Following Oncology Consultations

Outcome	Visual Aid Users (n=8)	Standard Consultation Group (n=19)
Correct identification of cancer stage/treatment goals	5/8 (62.5%)	8/19 (42.1%)
Improved recall of information discussed	7/8 (87.5%) reported improvement	17/19 (89.5%) anticipated benefit
Recall of treatment schedule	7/8 (87.5%) reported improvement	17/19 (89.5%) anticipated benefit
Communication with family/friends	6/8 (75.0%) reported improvement	17/19 (89.5%) anticipated benefit
Felt overwhelmed by the amount of information discussed	3/8 (37.5%)	14/19 (73.7%)
Patients attending alone who anticipated visual aids would facilitate communication	-	5/5 (100.0%) †

† Percentage calculated among patients who attended consultations alone (n=5) in the standard consultation group.

Overall Findings

Findings were consistent across both cohorts, with both experienced and anticipated benefits favouring the use of visual aids across domains of understanding, recall, communication, and engagement.

Discussion

This study demonstrates that the use of visual aids during oncology consultations improves patient-reported understanding, recall, and reduces perceived information overload. Patients also reported that visual aids facilitated communication with family members, particularly when relatives were not present during consultations. These findings are relevant in the context of increasing emphasis on patient-centred care and shared decision-making in oncology.

Effective communication is critical in oncology, where patients must process complex information and make informed decisions regarding their care. These findings are consistent with existing literature demonstrating that visual and structured communication interventions enhance information retention compared to verbal communication alone.^{6,8-11}

Visual aids may be particularly beneficial for patients with lower health literacy, as suggested by the observed association between educational attainment and awareness of cancer stage. This is consistent with evidence from a recent systematic review and meta-analysis demonstrating improved health literacy outcomes with visual-based interventions.⁹ Additionally, patients attending consultations alone may derive particular benefit, as visual materials can support subsequent communication with family members.

All participants identified English as their first language. Future studies should evaluate visual aids in more linguistically diverse populations, where such interventions may provide additional benefits in supporting comprehension of complex medical information.

The concordance between experienced and anticipated benefit across groups supports the consistency of these findings. Patients who used visual aids reported improvements across multiple domains, while those who had not received them consistently indicated that such tools would have been helpful.

This study has a number of limitations. It is a single-centre study with a small sample size, limiting statistical power and precluding inferential analysis. Outcomes were based on patient self-reporting and may be subject to response bias. Furthermore, visual aids were introduced as a targeted communication tool for newly diagnosed breast cancer consultations and consultations involving treatment changes rather than as a universal intervention, accounting for the higher proportion of patients who received standard consultations during the study period. The use of visual aids was also not standardised across consultations.

Despite these limitations, this study highlights a simple, low-cost intervention that may improve patient-centred communication in routine oncology practice. These findings are consistent with broader evidence supporting interventions that enhance patient understanding and involvement in decision-making in oncology care.⁷

In conclusion, visual aids represent a simple and acceptable intervention to support communication in oncology consultations. Their use was associated with improved patient-reported understanding, recall, and communication, while also reducing perceived information overload. These findings support the integration of visual tools into routine oncology practice, with further research warranted to evaluate their impact on clinical outcomes and decision-making.

Declarations of Conflicts of Interest:

None declared.

Corresponding Author

Shauna Moore-Davis,
Department of Medical Oncology,
University Hospital Galway,
Newcastle Rd.,
Galway City,
Co. Galway,
Ireland.

E-Mail: shauna.davis@hse.ie

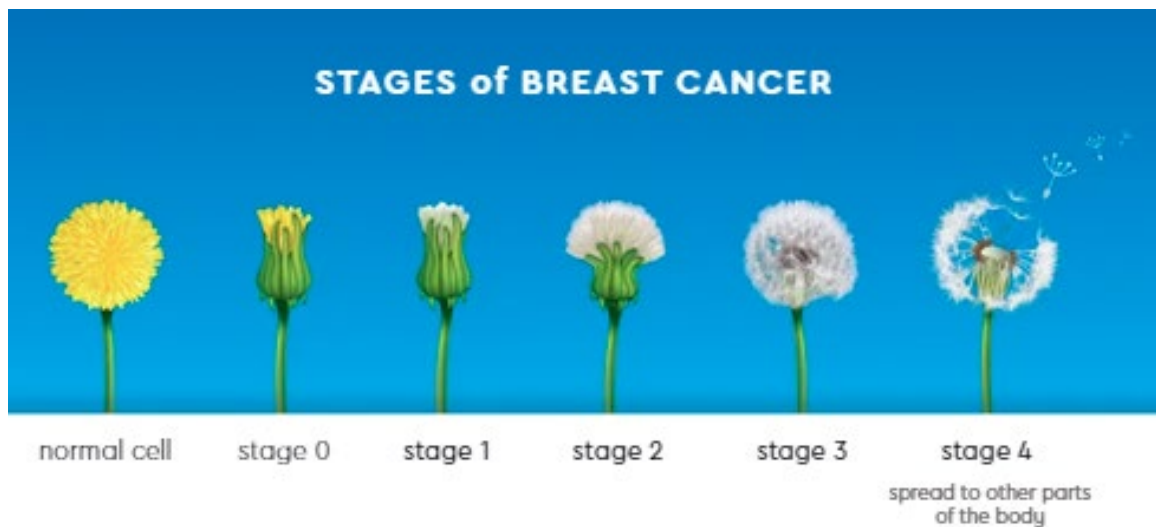
References:

1. Epstein RM, Street RL Jr. *Patient-centered communication in cancer care: promoting healing and reducing suffering*. Bethesda (MD): National Cancer Institute; 2007.
2. Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Low health literacy and health outcomes: an updated systematic review. *Ann Intern Med*. 2011;155(2):97–107.
3. Pitman A, Suleman S, Hyde N, Hodgkiss A. Depression and anxiety in patients with cancer. *BMJ*. 2018;361:k1415.
4. Kessels RPC. Patients' memory for medical information. *J R Soc Med*. 2003;96(5):219–22.
5. Zolnieren KBH, DiMatteo MR. Physician communication and patient adherence to treatment: a meta-analysis. *Med Care*. 2009;47(8):826–34.
6. Houts PS, Doak CC, Doak LG, Loscalzo MJ. The role of pictures in improving health communication. *Patient Educ Couns*. 2006;61(2):173–90.
7. Stacey D, Légaré F, Lewis K, Barry MJ, Bennett CL, Eden KB, et al. Decision aids for people facing health treatment or screening decisions. *Cochrane Database Syst Rev*. 2017;(4):CD001431.
8. Siachalinga L, Kim H, Brochstedt Dieperink K, Coyne E. Effectiveness of visual-based interventions on understanding cancer information: a systematic review. *Cancer Control*. 2026;33:10732748261446035.

9. Galmarini E, Marciano L, Schulz PJ. The effectiveness of visual-based interventions on health literacy in health care: a systematic review and meta-analysis. *BMC Health Serv Res.* 2024;24(1):718.
10. Garcia-Retamero R, Cokely ET. Communicating health risks with visual aids. *Curr Dir Psychol Sci.* 2013;22(5):392–9.
11. Epstein RM, Duberstein PR, Fenton JJ, Fiscella K, Hoerger M, Tancredi DJ, et al. Effect of a patient-centered communication intervention on oncologist–patient communication, quality of life, and health care utilization in advanced cancer: the VOICE randomized clinical trial. *JAMA Oncol.* 2017;3(1):92–100.

Appendix 1. Visual Aids Used During Oncology Consultations

Appendix Figure 1. Dandelion life-cycle visual aid for cancer staging



Appendix Figure 2. Dandelion seed filament visual aid for tumour receptor status



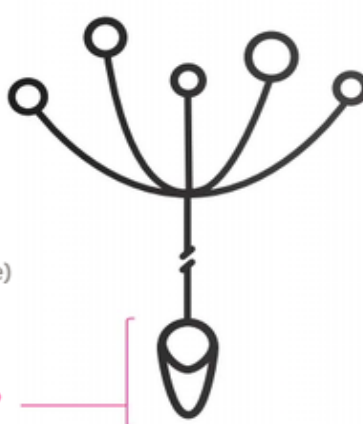
Picture a cancer cell like a tiny dandelion seed with two parts.

These parts were tested to learn the "subtype" (what makes the cancer grow).

Your subtype results were:

**HER2
receptors?**

- ☐ HER2+
- ☐ HER2-low
- ☐ HER2-
(not used, negative)



**hormone
receptors (HR)?**

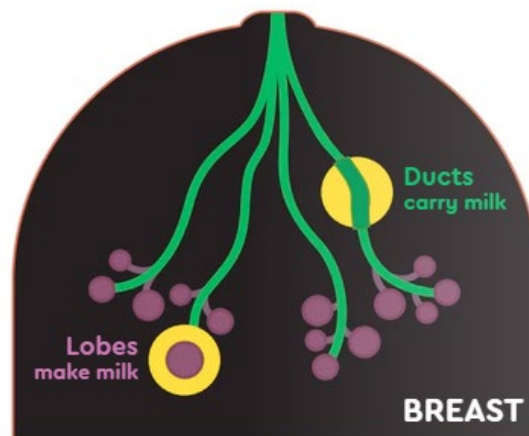
- ☐ ER+ (estrogen receptor)
- ☐ PR+ (progesterone receptor)
- ☐ estrogen (ER-) ☐ progesterone (PR-)

- ☐ **triple negative** (is ER-, PR-, and HER2-)

For this subtype, the cancer cells do **not** use ER, PR, or HER2 to grow.

Appendix Figure 3. Breast anatomy visual aid

Where did the cancer begin?
(a "cancer type" is like the roots of the cancer)



Of invasive breast cancers, about **8 in 10 start in the ducts (ductal)** and about **1 in 10 start in the lobes (lobular)**.

Your tests showed this cancer type:

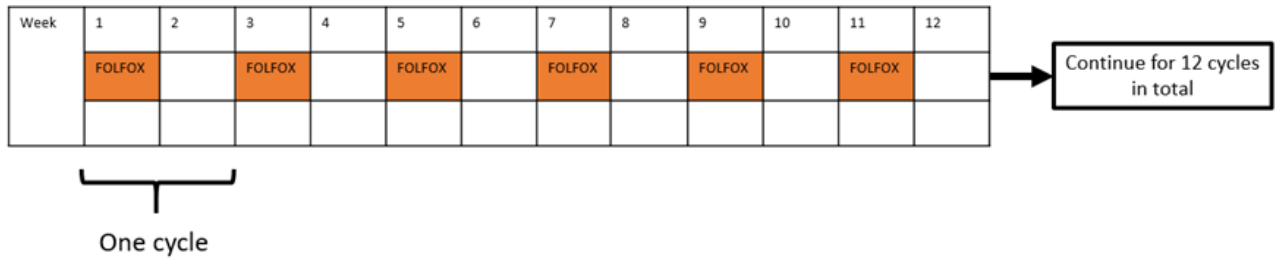
- ☐ **Ductal** Invasive Ductal Carcinoma (**IDC**)
- ☐ **Lobular** Invasive Lobular Carcinoma (**ILC**)
- ☐ **Inflammatory** Inflammatory Breast Cancer (**IBC**)
- ☐ Other: _____

Appendix Figure 4. Chemotherapy treatment timeline visual aid

FOLFOX (Adjuvant colorectal cancer)

- FOL – Folinic acid (vitamin, increases chemo efficacy)
- F – 5-Fluorouracil (chemotherapy)
- OX – Oxaliplatin (chemotherapy)

FOLFOX



Appendix Figure 5. Visual aid explaining common cancer treatment modalities



Appendix 2. Example Patient Questionnaire Used in the Study

Visual aids – patient satisfaction survey

- When you saw your medical oncology team as a new patient or to discuss a new treatment, did you receive visual aids during the consultation?

☐ Yes ☐ No

- Examples:

Patient sticker: _____ Date: _____

STAGES OF BREAST CANCER

Tumour size: _____

Number of positive lymph nodes: _____

Where did the cancer begin?
(a "cancer type" is like the roots of the cancer)

Picture a cancer cell like a tiny dandelion seed with two parts. These parts were tested to learn the "subtype" (what makes the cancer grow).

Your subtype results were:

HER2 receptors?

☐ HER2+ ☐ HER2-low ☐ HER2- (not used, negative)

hormone receptors (HR)?

☐ ER+ (estrogen receptor) ☐ PR+ (progesterone receptor) ☐ estrogen (ER-) ☐ progesterone (PR-)

☐ triple negative (in ER-, PR-, and HER2-)

For this subtype, the cancer cells do not use ER, PR, or HER2 to grow.

Your tests showed this cancer type:

☐ Ductal Invasive Ductal Carcinoma (IDC) ☐ Lobular Invasive Lobular Carcinoma (LIC) ☐ Inflammatory Inflammatory Breast Cancer (IBC) ☐ Other: _____

CHEMOTHERAPY
disrupts fast growing cells

TARGETED THERAPY
targets specific proteins

HORMONE THERAPY
blocks hormone activity

SURGERY
removes, repairs, or investigates

RADIATION
breaks cells apart with rays

IMMUNOTHERAPY
helps immune cells fight cancer

CLINICAL TRIALS
offers new tests or treatments for treating cancer

FOLFOX (Adjuvant colorectal cancer)

- FOL – Folinic acid (vitamin, increases chemo efficacy)
- F – 5-Fluorouracil (chemotherapy)
- OX – Oxaliplatin (chemotherapy)

FOLFOX

Week	1	2	3	4	5	6	7	8	9	10	11	12
	FOLFOX		FOLFOX		FOLFOX		FOLFOX		FOLFOX		FOLFOX	

One cycle

Continue for 12 cycles in total

Visual aids – patient satisfaction survey

Personal Information

Name:

Age:

☐ Under 18 ☐ 18-24 ☐ 25-44 ☐ 45-64 ☐ 65-74 ☐ 75 or older

Date of birth:

Gender:

☐ Male ☐ Female ☐ Prefer not to say ☐ Other:

Highest level of education completed:

☐ Primary school ☐ Secondary school ☐ College/University degree
☐ Postgraduate degree (eg: Masters, PhD)

What is your ethnicity?

☐ White/Caucasian ☐ Black ☐ Hispanic/Latino
☐ Asian ☐ Middle Eastern ☐ Other:

What is your country of origin?

☐ Ireland ☐ UK ☐ EU: ☐ Non EU:

Did you require an interpreter?

☐ No ☐ Yes – sign language ☐ Yes – language interpreter:

Visual aids – patient satisfaction survey

Cancer Information

What kind of cancer do you have? : _____

What stage is your cancer? :

- ☐ Early (curative) ☐ Metastatic (not curative, treatment is for disease control) ☐ Not sure

Was someone with you during the consultation?

- ☐ No, I was alone ☐ Yes – A family member ☐ Yes – a friend
☐ Yes – other _____

If you received a visual aid : Please proceed to Section 1

If you did not receive a visual aid : Please proceed to Section 2

Received visual aids – patient satisfaction survey (Section 1)

How did you feel about the amount of information discussed during the consultation?

- ☐ It was overwhelming ☐ Somewhat difficult to process ☐ Neither ☐ Somewhat easy to process ☐ Very easy to process

Was the visual aid easy to understand?

- ☐ Very difficult ☐ Somewhat difficult ☐ Neither ☐ Somewhat easy ☐ Very easy

Did the visual aid help you to remember the information discussed at the consultation?

- ☐ It did not help ☐ Slightly helpful ☐ Somewhat helpful ☐ Very helpful ☐ Extremely helpful

Did the visual aid help with your focus during the consultation?

- ☐ It did not help ☐ Slightly helpful ☐ Somewhat helpful ☐ Very helpful ☐ Extremely helpful

Did the visual aid help you explain the information discussed at the consultation to family members/friends who were not present?

- ☐ It did not help/ I did not use it ☐ Slightly helpful ☐ Somewhat helpful ☐ Very helpful ☐ Extremely helpful

Did the visual aid help you in remembering the schedule of the planned therapies?

- ☐ It did not help ☐ Slightly helpful ☐ Somewhat helpful ☐ Very helpful ☐ Extremely helpful

Did not receive visual aids – patient satisfaction survey (Section 2)

How did you feel about the amount of information discussed during the consultation?

- ☐ It was overwhelming ☐ Somewhat difficult to process ☐ Neither ☐ Somewhat easy to process ☐ Very easy to process

Would a visual aid have helped you in remembering the information discussed at the consultation?

- ☐ It would not help ☐ It would be slightly helpful ☐ It would be somewhat helpful ☐ It would be very helpful ☐ It would be extremely helpful

Would a visual aid have helped you in explaining the information discussed at the consultation to family members/friends who were not present?

- ☐ It would not help ☐ It would be slightly helpful ☐ It would be somewhat helpful ☐ It would be very helpful ☐ It would be extremely helpful

Would a visual aid have helped you in remembering the schedule of the planned therapies?

- ☐ It would not help ☐ It would be slightly helpful ☐ It would be somewhat helpful ☐ It would be very helpful ☐ It would be extremely helpful

Additional Information

Is there anything else you would like to share with us?

If you had received a visual aid, any feedback on how to improve it is welcome

Thank You!

Thank you for taking the time to fill out our survey.
Your feedback is valuable to us.