Bone Marrow Transplantation (2019) 53:819–833
https://doi.org/10.1038/s41409-018-0321-3

ABSTRACT

The 44th Annual Meeting of the European Society for Blood and Marrow Transplantation: Nurses Oral Session

18–21 March 2018 ● Lisbon, Portugal

Published online: 24 September 2018

Sponsorship Statement: Publication of this supplement is sponsored by the European Society for Blood and Marrow Transplantation.

NURSES GROUP—ORAL SESSION

NO001
Nursing Roles in the Management of Neuroblastoma Patients Receiving Dinutuximab Therapy Post Autologous Stem Cell Transplant

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Background: Neuroblastoma, an embryonic cancer of the sympathetic nervous system, is the most common extracranial solid tumor in childhood. It accounts for 6% of childhood cancers in patients less than 15 years of age. It is a heterogeneous disease for which some tumors regress or mature while others progress through multimodal therapy. Treatment is driven by risk groups noted as low, intermediate or high. Nearly fifty percent of patients are diagnosed with high risk disease. Evolution of treatment has demonstrated an increased event free survival (EFS), most notably by the addition of post consolidation treatment with Dinutuximab. Dinutuximab, a monoclonal antibody targeting the disialoganglioside GD2 antigen found on the surface of Neuroblastoma (NBL) cells, has shown to significantly improve survival rates in patients with high risk NBL. Findings from the Children's Oncology Group (COG) randomized phase III study (ANBL0032) resulted in a 20% increased EFS to 66% which led to the approval of this therapy for patients with high risk NBL. However, the safe and effective use of Dinutuximab requires medical and nursing expertise in the treatment administration, monitoring and management of adverse reactions. Multi-institutional nursing approaches to implementing standard protocols ensure the effective management of NBL patients receiving Dinutuximab immunotherapy.

Methods: This presentation will include a brief overview of monoclonal antibody therapy and specify strategies to address adverse reactions associated with Dinutuximab therapy. Specific strategies for the management of pain, infusion reactions, capillary leak syndrome, hypotension and fever will be described. The critical roles of the direct care nurse and the advanced practice nurse and related patient family education will also be presented.

Results: Dinutuximab infusion related side effects can be anticipated and recognized early and managed effectively. Improved knowledge, competency and adequate resources for direct care nursing staff and advanced practice nurse providers have been crucial for the delivery of safe quality care for these patients.

Conclusions: Dinutuximab therapy is an effective and safe cancer treatment modality. Understanding and implementing recommendations for the management of the clinically important and most common adverse reactions are essential to ensuing patient continuation of therapy and improved patient outcomes.

Conflict of interest: I have no conflicts to disclose for this presentation

NO002
Implementation of a standardized oral care program in paediatric haematology-oncology patients - a single center experience

Sibylle Chettata

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Background: Acute and late oral and dental complications are common among patients undergoing chemotherapy and haematopoietic stem cell transplantation (HSCT) with implications on treatment course and quality of life during and after therapy. Dental screening, dental follow-up and a routine plan for oral care can prevent or reduce these severe consequences.

Methods: Based on current guidelines and clinical experience we developed an oral care program for paediatric haematology-oncology patients at our institution.

The program consists of 1) an oral and dental examination at diagnosis, respectively before HSCT, with regular follow-up every 3 months by a dentist, 2) a standardized protocol for basic oral care, and 3) a nurse-led patient/parent educational program. Basic oral care comprises tooth brushing, tooth protection and mouth rinses.

Included in the program were all newly diagnosed oncological patients as well as patients undergoing HSCT. Daily oral care and used mouth care products of patients were assessed at start of the program. Adherence with standardized basic oral care was assessed after patient/parent education, and at the end of intensive treatment phase, respectively at discharge after HSCT.

Results: Since the introduction of the oral care program in 2012, 91 newly diagnosed oncological patients and 26 patients before HSCT were educated by trained nurses in basic oral care. Assessment of oral care at start showed that only 31% of all included patients brushed their teeth regularly three times a day and 29% sometimes used a dental or mouth rinse.

After patient/parent education 76% of assessed patients ($n = 88$) brushed their teeth as recommended three times a day, 43% regularly used the product for tooth protection, and 50% rinsed their mouth at least three times a day. At the end of intensive therapy 70% of assessed patients ($n = 56$) brushed their teeth three times a day, 34% used the product for tooth protection, and 43% regularly rinsed their mouth at least three times a day.

Conclusions: Implementation of an oral care program improved mouth care of patients in the short term. We observed some decrease in adherence over time, underlying the necessity of repeated inputs from the oncological team to maintain a high level of motivation and adherence to basic oral care. Further investigations are necessary to study middle and long-term adherence as well as its effect on oral complications.

Conflict of interest: Nothing to declare by all authors

NO003
Frequency of infusion-related adverse reactions after cellular therapy product infusion in pediatric population

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Background: Hematopoietic stem cell transplant involves the administration of autologous or allogeneic cellular therapy products (CTP). Our initial institutional practice was to administer acetaminophen, diphenhydramine, and hydrocortisone as pre-medications to all CTP infusions except donor lymphocyte infusion (DLI) to prevent infusion-related adverse reactions (ARs). However, we recently changed our practice to remove hydrocortisone from routine use in all CTP and reserve it for treatment of severe reaction. The reason is partly because of the increased use of haploidentical transplants at our center with the need to avoid any immunosuppressant prior to post-transplant cyclophosphamide administration. In our study, we assessed the frequency of infusion-related ARs among all patients and evaluated the impact of removing hydrocortisone as routine pre-medication.

Methods: We retrospectively reviewed transplant characteristics and infusion-related ARs of a total of 180 CTP infusions that were performed at our center between January 2010 and October 2017. We followed standard institutional guidelines for the infusion of cryopreserved and fresh CTP.

Results: The table below summarizes transplant characteristics and infusion-related ARs among patients who received CTP with or without hydrocortisone. Only 11 (6%) infusion-related ARs were reported among all patients. Most ARs were of grade 1 or 2 and one patient had grade 3

rash that resolved with appropriate treatment. None of our patients had grade 4 or 5 ARs. There was no statistical significant difference between the frequency of ARs in relation to the use of hydrocortisone (P = 0.6). However, it is important to note that fresh CTP was used more frequently in the non-hydrocortisone group (76%) compared to hydrocortisone group (48%).

Conclusions: The use of standardized guidelines for CTP infusion was associated with low rate of ARs at our institution. In addition, omitting hydrocortisone from routine premedications was not associated with increased rate of ARs.

Conflict of interest: None

Characteristics	Premedication with hydrocortisone (n = 155)	Premedication without hydrocortisone (n = 25)
Median age in years (range)	3.9 (0.04–13.61)	6.8 (0.41–13.66)
Gender (male/female)	81/74	12/13
BM/PBSC/Cord	74/74/7	20/4/1
Fresh/cryopreserved	74/81	19/6
Auto/Related/MUD/Haplo/Cord	71/73/4/0/7	3/12/1/8/1
Engraftment	98%	100%
Infusion-related ARs	9 (6%)	2 (8%)
Grade 1	Bradycardia (n = 1)	Fever (n = 1) Vomiting (n = 1)
Grade 2–3	Hypertension (n = 4) Rash (n = 2) Vomiting (n = 1) Headache (n = 1)	0

[[NO003 Table] Table I]

NO004
The Use of Videography as a Discharge Education Teaching Tool For Children After a Hematopoietic Stem Cell Transplant

Shinyi Tang

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Background: Assuming responsibility of a child's post-hematopoietic stem cell transplant (HSCT) care at home is challenging for parents, and discharge education is critical to ensure that parents are prepared. The purpose of this study is to evaluate the feasibility and effectiveness of a discharge video intervention (DVI) used as an adjunct to standard discharge teaching (SDT).

Methods: A two phase pilot feasibility study was conducted at Children''s Hospital Los Angeles from 2014 to 2017. Phase I consisted of nurse-administered proficiency testing based on a 4-point Likert-type scale, of parents of children post -Allogeneic HSCT nearing discharge. Parent's knowledge of discharge preparedness and caring for their child in at home was assessed after SDT. These results informed the DVI, created in English and Spanish during Phase II. The DVI was uploaded to the in-hospital patient network allowing parents to view the DVI at their convenience. The DVI included content on home cleaning, notifying the medical team, graft -vs- host disease (GVHD), diet and visitor restrictions, and post- HSCT clinic visits. The DVI was offered to parents in addition to SDT in phase II. Nurses re-evaluated parent's proficiency related to discharge preparedness after parents received the DVI, prior to the child's discharge.

Results: Thirty-four parents participated: 17 in phase I (SDT), 17 in phase II (SDT + DVI). Parents in phase II viewed the video a mean of 2.13 times. Parents in phase II had higher proficiency scores on: home cleaning prior to discharge, what is GVHD, signs and symptoms of GVHD and diet restriction. Parents in phase I SDT had higher proficiency related to when to call the medical team.

Conclusions: The DVI was feasible and demonstrated incremental increases in parent's proficiency related to some discharge topics. Future research is needed on discharge teaching techniques specifically related to home medications, and tailored to parents learning styles.

Conflict of interest: No conflicts of interest.

NO005
An Investigation into the Nutritional Status of Adolescent and Young Adults Undergoing Stem Cell Transplantation

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Background: University College London Hospital (UCLH) is the largest centre for haematology in Europe. A significant proportion of this population are adolescent and

young adults (AYA) undergoing stem cell transplants (SCT). From practice we know that nutrition is an important aspect of supportive care through SCT. However, limited research is available on this in the AYA population. Therefore we undertook a retrospective cohort study to investigate further.

Methods: All AYA patients who underwent allogenic SCT at UCLH from February 2015 to January 2017 were included (n = 33). Data was collected from medical records on anthropometry, dietetic input and admission duration. Statistical software was used for data analysis.

Results: 10 teenagers and 23 young adults were included. 24 patients had a cancer diagnosis. Median length of admission was 41 days and median percentage weight loss was 6.23% through admission. This was found to be statistically significant. At the start of treatment 9% of patients were undernourished, 58% were well-nourished and 33% were overweight or obese. Length of admission for malnourished patients (under and overweight) was 10.1 days longer than for well-nourished patients. A moderate, negative correlation was found between weight change and time to dietetic intervention ($p = 0.042$).

Conclusions: This study highlights the importance of timely dietetic input for this patient group to minimise weight loss through SCT. It is difficult to distinguish whether weight loss is a cause or result of prolonged admission. Although statistical significance was not achieved the trends identified suggest that nutritional status at the start of treatment may have an impact on length of admission. Limitations of the study include potential fluid overload affecting anthropometry and small sample size. Future research would benefit from a larger sample size and prospective design.

Clinical Trial Registry: n/a

Conflict of interest: None of the authors has anything to disclose.

NO006
The Evaluation of Hyperhydration for High Dose Melphalan in Stem Cell Transplantation

Midori Nakagaki[1], Elise Button[1], Amy Keating[1], Jodie Marsh[2], Chris Mitchell[2], Andrew Birchley[2], Glen Kennedy[1]

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Background: Although there is no evidence to support the practice, hyperhydration of approximately 6 litres (L) of normal saline is administered in some institutes with high dose melphalan (HDM) in haematopoietic stem cell transplantation (HSCT). This study aimed to evaluate the benefits and adverse effects of hyperhydration by retrospectively comparing patients' outcomes between institutes using hyperhydration and not using hyperhydration.

Methods: This study employed a retrospective cohort design. A chart review was performed on patients who had received a HDM autologous HSCT for myeloma between January 2015 and September 2017 at the Royal Brisbane and Women's Hospital (RBWH) and The Townsville Hospital (TWH). These institutions were selected based on the similar in-patient treatment provided to HSCT patients. The main difference between the two institutions was the amount of fluid administered with melphalan (6L vs 2L). Patients' demography, daily creatinine (Cr) and weight were collected from admission to day 7 post HSCT. Additionally, fluid overload (O/L), frusemide use, acute pulmonary oedema (APO), sepsis, antibiotic use and mucositis grade were recorded from the medical record. Data was analysed using Student t-test or Fisher's exact test.

Results: The total sample was 88: 54 patients with hyperhydration (RBWH) and 34 patients without hyperhydration (TWH). Patients' demography such as age, gender and history of renal failure were all comparable. The baseline Cr on day before melphalan administration was not significantly different. Using the Kidney Disease Improving Global Outcomes (KDIGO) Clinical Practice Guideline for renal dysfunction, 6/54 patients (11%) and 2/34 patients (6%) had mild acute kidney injury at RBWH and TWH respectively ($p = 0.48$). The change in Cr from baseline (maximum Cr / baseline Cr) was larger in the hyperhydration cohort (1.14 vs 1.03, $p< 0.01$). Between melphalan administration and day 7 post HSCT, 5/54 patients (9%) and 2/34 patients (6%) experienced clinical O/L at RBWH and TWH respectively ($p = 0.7$). There was no record of APO in either group, however two patients with hyperhydration required oxygen after the hyperhydration. Two patients without hyperhydration had hypotension after melphalan administration, however they had sepsis at the same time. The early weight gain was larger in hyperhydration cohort at RBWH but not significantly (1.79kg vs 1.15kg, $p = 0.09$).

Conclusions: In this small study hyperhydration (6L) did not show benefits in protecting the kidney compared to the normal hydration (2L). There were no statistically significant increases in adverse effects such as O/L or APO associated with hyperhydration. Further research is warranted however, it appears hyperhydration is not required with HDM.

Conflict of interest: Nothing to disclose

NO007
Analysis of parent, staff and ward experience following the implementation of a robust, validated teaching tool for parents of children who require (home) parenteral nutrition

Joanne Ellis

Royal Manchester Childrens Hospital, Bone Marrow Transplant Unit, Manchester, United Kingdom

Background: Bone marrow transplant (BMT) recipients often require parenteral nutrition (PN) to meet their nutritional needs where there is intestinal failure. Intestinal failure after BMT may be contributed to by Graft versus Host Disease (GVHD), drug toxicity, virus infection associated with immune deficiency and the underlying primary disease process. Intestinal failure and the need for PN will frequently delay discharge of an otherwise well child. Therefore, we have over a 2 year period introduced home PN teaching to parents of paediatric patients requiring long term PN. We have treated 6 patients in this way and this paper reviews the staff, ward and parental experience of the programme, including readmission rates and the work required to train the parents.

Methods: For successful PN administration at home the presence of a competent parent/caregiver is essential. Working with the gastro-intestinal clinical nurse specialist (CNS), a teaching tool was validated and adapted for BMT patients. This includes teaching sessions with emphasis on aseptic non-touch technique, central venous catheter care, hand washing and fluid administration through giving sets. Also included is completion of a skills-assessment booklet and a formal assessment of parental competence prior to patient discharge.

Six patients were reviewed over a period of 2 years who required home PN. The length of time required from the date of discharge, incidence of readmission to hospital with central line related infections and extra pressures arising were all retrospectively recorded from case records and questionnaires.

Results: Home PN has been a great success in our Unit and has lead to earlier discharge in many patients who would otherwise been inpatientsl. Home PN was given for 898 days to 6 patients which are hospital-bed days saved.

Nevertheless home PN training has a significant impact on nursing staff work load. Staff see the benefit of the programme and are motivated to assist with the training. Attention has to be given therefore to shift nurse numbers when training is being undertaken, or the working day hours of the BMT CNS changed to include "PN set-up".

Two out of six parents found that the training is often difficult when done in the room with the child awake, as the child distracts them. Discrepancy between hospital and community equipment caused problems, only solved by training in the home itself. There may be infrastructural solutions to this and is the subject of further investigation.

Conclusions: The training and co-ordination of home PN is a complex and time consuming project for both parents and staff. The success of sending patients home on PN requires a co-ordinator who liaises with the family and organisations. The increased availability of home PN teaching has had a positive impact on patient and family experience in our Unit, allowing early discharge and has considerably relieved some bed pressures within the unit.

Our oncology/haematology ward also uses the teaching packs for their patients requiring long term PN. A new practice Educator on the unit has been able to further support this development.

Conflict of interest: Nothing to disclose

NO008
Dealing with sudden donor changes and meeting the needs of the patient

Angela Leather

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Background: Allogeneic donors are always assessed as medically fit and consented to proceed with donation prior to recipient commencing conditioning. We describe 3 case reports where the donor did not donate despite this procedure. Last minute decisions to proceed or postpone transplant can be distressing to those involved. The aim is to highlight the implications of such significant events, reflect on lessons learned and discuss key points for best practice.

Methods: Data relating to 3 patients treated within our centre has been collated for this case series, outcomes reported and implications discussed.

Patient 1: A male donor was cleared / consented for Peripheral Blood Stem Cell (PBSC) and the patient subsequently admitted. On the day of admission, registry reported that the donor was no longer able to donate due to work complications.

Patient 2: A male donor selected for PBSC donation was confirmed fit / willing to donate. The patient was admitted and started conditioning. On day minus 2 the donor was unable to continue with apheresis and the donation discontinued.

Patient 3: PBSC planned from a male donor deemed medically fit and suitable to donate; conditioning started. The registry called as the donor had a severe reaction to GCSF and could not proceed.

Results: Patients 1 & 3 were able to have treatment plans abandoned. Patient 1 was admitted that morning but

fortunately not started treatment; a delay of 4 weeks. Patient 3 received 4 doses of fludarabine prior to cancellation of the donor; conditioning halted until a further donor could be requested.

Patient 2 could not discontinue; he had already received chemotherapy and TBI; two cords were identified for infusion within the week as time constraints negated work-up of replacement donor

Conclusions: Psychological distress was significant for all three patients and concerns regarding recovery and transplant were evident. Managing such complex and unexpected situations effectively is paramount. Implications for clinical practice and the impact of such situations on clinical staff, including liaison within the team both internally and externally, will be reflected on within this presentation.

Conflict of interest: Nothing to disclose

NO009
Return to work support for transplant patients: A pilot study

Julie Denning

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Background: A recent review by Anthony Nolan (The Way Back to Work, 2015) found that those people in paid work post treatment demonstrated improved wellbeing including mobility, self-care, performing usual activities and pain/discomfort as well as higher general health. Their survey found that people wanted to feel normal again and returning to work was part of that process. Work also acted as a 'milestone' and helped people with their recovery as well as keeping depression at bay. Having someone advocate for people came out as a central research finding and a need for those recovering from cancer.

The aim of our pilot study was to explore post-transplant patient's experiences of a vocational rehabilitation programme.

Methods: People were offered the opportunity to receive work focused support over 3 hours by telephone. Patients could speak to a health coach plus physiotherapist to help with their return to work plans and build up their confidence, strength and stamina to return. Mood was monitored and advice and signposting to psychological support provided.

Ethical approval was not necessary for this work. We sought people´s consent to be able to use their data for research and evaluation purposes and assured them that their data would remain confidential and anonymous.

9 people were offered the opportunity to attend the service and 8 took it up; 3 men and 5 women with an average age of 43 years.

Individual case reviews were carried out. Work related outcomes were collated, as was data on uptake of a physiotherapy appointment. Data from patient satisfaction questionnaires was analyzed.

Results: Two people were supported to change their jobs and were successful in achieving this. One was supported through a redundancy process. One was supported to return to her role on a phased basis. Another was supported to improve the quality of his life and to actively search for a new role. One person was supported to remain in her role and built her confidence to look for a more suitable role. Another was just about to start a new job and was supported in the process. One patient was too unwell and the service was put on hold temporarily.

Three patients requested to have one of their sessions with a physiotherapist for exercise advice. All patients were encouraged to maintain or increase their levels of activity.

80% reported progress in improving their ability to work. Everyone felt they were given helpful advice and information about issues troubling them and felt better post service. Everyone would recommend the service to people who want to stay or get back to work after illness. The service was rated 9.6/10 for excellence.

Conclusions: People post-transplant have benefitted from psychological and physical support from a personalised vocational rehabilitation programme. The positive outcomes from this pilot suggest further implementation of the service to help people to recover from cancer treatment and return to work.

Conflict of interest: Anthony Nolan paid Working towards wellbeing to provide the rehabilitation pilot programme for its patient audience.

NO010
Nursing Education in the early detection of cytokine release syndrome in patients receiving CAR-T cells

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Background: Patients receiving treatment with CAR-T cells are at risk of Cytokine Release Syndrome (CRS) in the days following cell infusion. CRS, a systemic inflammatory response, is caused by elevated levels of cytokines, as a result of T-cell activation and proliferation (Maude et al, 2014). Although the pathophysiology is not fully

understood (Gödel et al, 2017), CRS symptoms range from mild (fever, tachycardia) to severe and potentially life-threatening (significant hypotension, vascular leak, respiratory and renal failure, cytopenias and coagulopathy) often necessitating ICU transfer for organ support and with CRS related deaths documented in the literature.

Methods: Guidance (Lee et al, 2014) suggests treatment with Tocilizumab for grade 3 CRS or grade 2 if elderly or multiple comorbidities. However, more recent evidence (Gardner et al, 2016) supports that earlier intervention leads to better outcomes and improved patient experience, with no adverse effect on the efficacy of CAR-T cell treatment. A local practice review was conducted in light of data and led to a practice modification favouring earlier Tocilizumab for CAR-T cell related CRS.

As a result, all patients with persistent fever refractory to antibiotics after 48 hours are considered for Tocilizumab treatment.

Clinical ward staff have received education from the clinical research team, predominantly the research nurse, but also the consultant, research fellow and clinical nurse specialist on CRS including early detection and monitoring of signs and symptoms, grading and triggers for early review by ICU outreach. Working collaboratively with ICU colleagues, we have agreed criteria for ICU transfer, offer training to ICU nursing staff and have a specific ICU link consultant for CAR-T cell patients.

Patients were also educated on the symptoms of CRS at the time of consent, whilst being mindful of the psychological distress that this may cause.

We have adopted this approach in five patients. Four of these patients required treatment with Tocilizumab, which was delivered on the ward. Three of the patients were then transferred to ICU for a number of days for further treatment and closer monitoring.

Results: Patients treated with CAR-T cells are cohorted on one ward at present, this enables teaching to be targeted and is deemed to be a safer approach to caring for patients in this high risk group. This teaching has led to increased awareness of the symptoms of CRS. Ward nursing staff have become more confident in the early detection and escalation of these patients and have developed strong links with the intensive care outreach team.

Conclusions: The detection and treatment of CRS is a new area for the nursing staff in our team. This is a challenging area, with limited evidence to guide management at present. The above interventions have increased awareness and early treatment. Ward nurses have reported being more confident in recognising and escalating symptoms promptly. Planned future developments include devising a formal treatment programme based on current literature and evaluating patient experience. The safety of the patient is paramount and all areas should consider CRS education prior to commencing CAR-T cell treatment.

Conflict of interest: R. Ellard: Molmed: honoraria

O. Stewart: Jazz: travel bursary and advisory board; Roche—non-promotional teaching; Abbvie—advisory boards, educational steering commitee and non-promational speaking

C. Graham: Servier: research funding; Pfizer: other: educational meeting attendance; Gilead: other: educational meeting attendance; Sanofi: other: educational meeting attendance

R. Benjamin: Pfizer: other: participated in adboard meeting, research funding; Servier: research funding; Celgene: honoraria.

NO011
Are we meeting their needs? Adequacy of energy and protein intakes after haematopoietic cell transplant: A prospective cohort study

Julie Beckerson, Anqi Song, Lina Johansson

Imperial College Healthcare NHS Trust, Nutrition and Dietetics, London, United Kingdom

Background: Haematopoietic stem cell transplant (HCT) patients experience treatment related side effects that significantly impair their ability to eat and drink. In our centre we employ strategies to optimise nutritional intakes including extra menus, nutritional supplement drinks, proactive nasogastric tube feeding (NGTF) or parenteral nutrition (PN) for those in whom NGTF fails. In this study we prospectively measured the adequacy of overall energy and protein intakes of patients during their hospital admission for HCT.

Methods: Patients aged ≥18 years undergoing HCT were invited to participate until a target of 50 subjects were recruited. Energy and protein intakes were recorded for 6 weeks, or until discharge, if sooner. Intake from all prescribed nutritional supplements, NGTF and PN were recorded daily. All other energy and protein intakes were estimated weekly, using averages calculated from 3-day food diaries and analysed using Dietplan software. Participants were assisted in accurate diary completion by a dietitian with regular reviews to minimise missing data.

Nutritional requirements were also calculated weekly. Energy requirements were estimated using the Henry equation to calculate basal metabolic rate, with added factors for metabolic stress, physical activity and dietary induced thermogenesis. Protein requirements were determined from nitrogen requirements based on dry body weight and clinical parameters that indicated metabolic stress. Overall adequacy of energy and protein intake was

calculated by comparing total intake against estimated requirements.

Kruskal-wallis testing was used to assess associations between overall adequacy of intake and basic patient and transplant demographics. The study was approved by Southampton & South West Hampshire Local Research Ethics Committee.

Results: Two patients declined to keep diaries after recruitment. Characteristics of included patients are shown in the table.

Mean (SD) adequacy of overall intakes during transplant admission was 65% (22.1) for energy and 49% (21.8) for protein. Analysis by week and transplant type is shown in the figure.

There was a similar trend for both autologous and allogeneic transplant patients for protein adequacy. Both groups achieved < 60% protein requirements from the start and demonstrated further deterioration in the week after admission and after week 1.

Energy adequacy fell in both groups for the first week and recovered up to week 2. Energy adequacy then deteriorated again in allogeneic transplant patients admitted for > 2 weeks. Participants who underwent an autologous transplant had a trend of higher energy adequacy but this difference, along with differences according to other variables shown in table 1 were all non-significant.

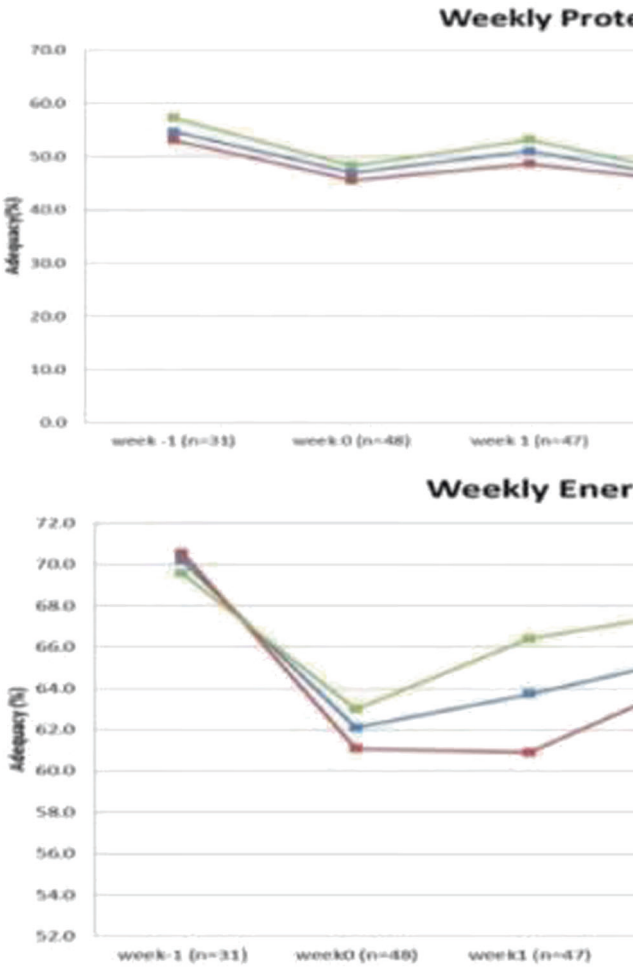
Conclusions: Despite efforts to support HCT recipients nutritionally, on average only one half of protein and two thirds of their energy requirements were met whilst in -patient. Furthermore intake adequacy deteriorated with increasing length of stay in this 6-week prospective cohort.

Conflict of interest: None of the authors has anything to disclose.

	Category	N
Gender	Male	28
	Female	20
Age	≤ 50	23
	≥ 50	25
Transplant type	Autologous	25
	Allogeneic	23
Conditioning	Autologous	25
	Reduced	13
	Myeloablative	10
Diagnosis	Leukaemia	23
	Myeloma	14
	Lymphoma	11

*[[**NO011 Table**] Table]*

*[[**NO011 Figure**] **Weekly Adequacy of Energy and Protein Intakes**]*



NO012

Predictors of parental psychological distress during the acute phase of pediatric hematopoietic stem cell transplantation in Japan: A multicenter prospective longitudinal study

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of Hematology and Oncology, Shizuoka Children's Hospital, Shizuoka, Japan

Background: Some parents exhibit elevated psychological distress before their child's hospital admission, peaking approximately 2–3 weeks after hematopoietic stem cell transplantation (HSCT). To understand both parents' experiences and psychological predictors of parental distress during the acute phase of HSCT, we examined anxiety and depression in parents of children before undergoing HSCT (T1) and 1-month after transplantation (T2). We explored factors that predicted T2 parental anxiety and depression to reduce parental distress before transplantation.

Methods: A prospective, quantitative study was conducted at 4 children's hospitals between June 2015 and September 2016 using self-administered questionnaires and medical records. Nineteen fathers (Mean age: 41.3 ± 5.0 years, range: 32–52 years) and twenty-three mothers (Mean age: 38.3 ± 5.3 years, range: 29–48 years) completed the Hospital Anxiety and Depression Scale and provided information regarding their cognitive processes (Perceives Stress Scale), methods of coping (Coping Health Inventory for Parents), family functioning (Family APGAR and Love Scale), demographic characteristics, and their perception of their children's health-related quality of life (Pediatric Quality of Life Inventory™ Generic Core Scales). A hierarchical multiple regression analysis was performed to analyze data regarding T2 parental anxiety and depression. The study was approved by the ethics committee at the Graduate School of Medicine, The University of Tokyo, and the institutional review boards at the hospitals at which the survey was conducted.

Results: Children's mean age was 8.3 ± 3.1 years (range: 2–14 years, 14 (61%) boys), and six (26%) children had been diagnosed with acute lymphoblastic leukemia. Mean T1 and T2 paternal anxiety and depression scores were 9.3 and 8.2, respectively and 9.2 and 7.6, respectively. Mean T1 and T2 maternal anxiety and depression scores were 8.1 and 6.9, respectively and 7.0 and 6.9, respectively. These scores were higher relative to those of the general population. Parents' anxiety and depression did not differ significantly between T1 and T2; however, it decreased over time. T1 paternal depression ($\beta = .64$, $P = .014$) and understanding the medical situation by communicating with other parents and consultation with medical staff ($\beta = -.86$, $P = .049$) predicted T2 paternal depression. T1 maternal anxiety ($\beta = .65$, $P = .047$) and marital satisfaction ($\beta = -.52$, $P = .013$) predicted T2 maternal anxiety. Children's demographics and illness factors were not significantly associated with T2 parental anxiety and depression.

Conclusions: Medical staff should understand that parents of children undergoing HSCT experience considerable psychological distress throughout the process; therefore, they should adopt unique approaches to proactively reduce this. Future studies should analyze paired parental data using multilevel analysis methods.

Conflict of interest: [S. Nakajima]: nothing to disclose

NO013
A critical appraised topic (CAT): What is the need for hydration after autologous stem cell transplantation?

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Background: There appeared to be a different approach between transplantation centres in the Netherlands in how to treat patients after reinfusion of autologous stem cells with Dimethyl Sulfoxide (10% DMSO). What is the evidence based practise (EBP)? A nurse from the St. Antonius Hospital Nieuwegein made a CAT.

Methods: A search in PubMed and Embase with the following search terms: *Stem Cell Transplantation; Dimethyl Sulfoxide; DMSO; Fluid Therapy; rehydration, hydration, renal insufficiency, renal, kidney, adverse effects, side effects*, did not provide any answers to the question. Next is searched for an expert opinion and background information. All thirteen transplant centres for adults in the Netherlands were sent a questionnaire about the current practice of hydration post-autologous SCT. Nine centres responded.

Results: There was a lot of variation of practice among the different centres. In seven centres hydration is given with 1 to 3 litres of fluid with different consistency. Two centres do not hydrate. From the total nine centres there were eight centres with no scientific backing for their practice. One centre stated it recently stopped post-hydration based on the pharmalogical characteristics of DMSO.

A hospital pharmacist of St. Antonius gave a clarification based on literature: the percentage of patients with toxicity of DMSO seems limited to 2 percent. (1) For the toxicity seems the concentration of DMSO most relevant. (2) Reduction in concentration of DMSO from 10% to 5% or lower provides a significant reduction of toxicity. The reduction in concentration seems to be more relevant than the acceleration of the elimination of DMSO 10% with post-hydration. Also there is no evidence found to support the reduction of toxicity of DMSO though post-hydration.

Based on a case report from the Lancet it appears that the effects from DMSO only last for 30 minutes. (3) This is

only one case report, but comparable with the current practise of the St Antonius Hospital, based on the use of 10% DMSO in autologous SCT.

If something is given intravenous it gives directly toxicity per definition. Because of the distribution volume of DMSO an accelerated of the elimination of DMSO changes nothing to the toxicity. The cardiac effects, like sinus tachycardia and hypotension last for about 30 minutes. So it seems not useful to shorten this time period with post-hydration with the absence of scientific backing. Nevertheless there is discomfort for patients given post-hydration. The St Antonius hospital stopped with hydration post autologous SCT. This new practice is evaluated for two years on side effects (65 patients). These resulted will be analysed in the near future.

Conclusions: Literature provides not enough evidence to substantiate hydration after autologous stem cell transplantation. Upon inquiry with other transplant centres there appears to be a lot of variety in current practice in the Netherlands. Based on an expert opinion it seems there is no need to post-hydrate after autologous stem cells with DMSO.

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Conflict of interest: None

NO014
THE EFFECT OF INHALATION AROMATHERAPY WITH ORANGE ESSENTIAL OIL ON NAUSEA, VOMITING AND ANXIETY DURING AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Background: Patients undergoing autologous stem cell transplantation suffer from nausea, vomiting and anxiety during the infusion of cryopreserved peripheral blood stem cell. Inhalation aromatherapy with orange essential oil may help to control these symptoms masking malodor of the dimethyl sulfoxide and stimulating the limbic system of the brain.

Methods: The aim of this study was to examine the effects of inhalation aromatherapy with orange essential oil on nausea, vomiting and anxiety during the infusion of autologous hematopoietic stem cell transplantation. This open label, parallel group quasi-randomized controlled study was conducted two stem cell transplantation units, located in Ankara, Turkey. A stratified sampling method was used to balance research groups with respect to conditioning regimen. A total of 70 patients were quasi-randomly assigned to either the intervention ($n = 35$) or the control group ($n = 35$). Patients in the intervention group inhaled the odor of six drop orange essential oil during the stem cell infusion. Patients in the control group were not implemented any intervention. Research data were collected using the visual analog scale (VAS), vomiting and retching episodes documentation form and the State Anxiety Inventory (STAI-I).

Results: There were no significant differences between the study groups in terms of nausea severity, and number of vomiting and retching episodes ($p>0.05$). Mean STAI-I score in the intervention group was significantly lower compared with that of the control group ($p < 0.05$).

Conclusions: Inhalation aromatherapy with orange essential oil may be useful to control anxiety during the autologous stem cell transplantation, but does not appear to decrease nausea severity and number of vomiting and retching episodes.

Conflict of interest: Nothing to disclose

NO015
Patients' main concerns regarding having a sibling as stem cell donor - A grounded theory study

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Background: Patients' experiences of having a sibling as donor have not been explored much. Also, the situation of the sibling donors is sparsely studied. A recent grounded theory study on adult sibling donors describes that being a sibling donor means doing what you have to do to fulfil

your duty as a sibling in order to try to save the life of a seriously ill brother or sister. The patients' life situation is most certainly affected by the transplantation with stem cells from a sibling donor. A theoretical framework of the patients' social process after having received stem cells from a sibling donor would be highly useful for enabling healthcare professionals to provide optimum support and empowerment. Therefore, the aim of this study was to explore patients' main concerns regarding having a sibling as stem cell donor and how they deal with them before and after transplantation in order to develop a theoretical framework.

Methods: Ten consecutive patients, 6 women and 4 men, with a median age of 54 years planned for HSCT (allogeneic haematopoietic stem cell transplantation) with a sibling donor were included in this study. Data were collected prospectively on three occasions (before HSCT, three and twelve months after HSCT) through in-depth interviews. These were recorded and transcribed verbatim, and analyzed by the Grounded Theory method according to Charmaz.

Results: The core category Recompensation summarises the process in the generated grounded theory including the three main categories; *Invest*, *Compensate* and *Celebrate*. Recompensation is defined as a lasting compensation given by the recipient for the loss or harm suffered or effort made by the sibling donor, i.e. the stem cell donation. Investment, pre-transplantation, is the starting point for the recipient's recompensation towards the sibling donor. The efforts made in this phase were aimed as investments in the transplantation project, i.e. the project of the recipient's survival. Compensation, three months after the transplantation meant that pay-back to the sibling donor started, by a two-folded approach: firstly, to cope with the situation and recover and secondly, to thank the donor and protect the relationship with the donor. Celebration, one year post-transplantation, meant paying tribute to the donor and to oneself and keep the stem cells working. Celebration was performed by enriching one's everyday life, rewarding the donor and protecting the donor.

Conclusions: There is a positive aspect of recompensataion, but it might also imply pressure and guilt. Having this knowledge of the both perspectives: the completely different main concerns for the sibling donors and for the recipients during the donation and transplantation process, health care should consider trying to influence the situation. One way of doing this, could be to organize a formal occasion for celebration and a closure. This to avoid eternal pressure of recompensation among recipients often suffering from various side-effects and complications, since they already have enough problems to handle.

Conflict of interest: Nothing to declare

NO016
HELPILIM: creation of a pillbox adapted to patients receiving allogeneic stem cell transplantation

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Background: Medication management at home following an allogeneic stem cell transplantation (ASCT) requires a specific type of care with personalized therapeutic education upon leaving the hospital.

The abundance of daily medications and the strictness of their intake schedule are causes of difficulties and stress for the patients.

An anonymous survey of patient receiving ASCT at the Limoges hematology department has revealed a lack of pillboxes adapted to their needs.

Methods: The inner compartments of commercially available pillboxes are too small and in insufficient numbers. Their often prohibitive cost further restricts their use.

Following this realization, we have elaborated a pillbox called HELPILIM that is given to our patient before their discharge from the hospital.

This educative tool has been elaborated with logistical support from the Astellas laboratory.

HELPILIM® is composed of 7 stackable daily boxes each containing 8 compartments of varying colors and sizes allowing the preparation of the treatment for an entire week. Those boxes are linked by an adjustable strap in order to facilitate transportation.

The cyclosporine-based anti-rejection treatment (NEORAL®) is comprised of capsules that must be kept in their original blisters and administered on a consistent schedule. Two specific large pink compartments accommodate that need.

Results: Before discharge, the prescription is prepared and sent by fax to the patient's local pharmacy in order to obtain the whole treatment.

On the day of the discharge, the transplant coordinator nurse performs a therapeutic education interview during which is given to the patient follow-up national book and ARCULIM cookbook. A loaned HELPILIM® is also offered along with instructions on its use. The nurse highlights the different medications on the prescription document with a fluorescent color corresponding to the color of the compartments where said medications are being stored. The patient then prepares himself his treatment in the pillbox. This time of preparation helps to explain the role of each drug and how taken.

Conclusions: HELPILIM® allows patient to safely prepare their follow-up treatment and to take it consistently, which is critical for the success of the transplantation. The effectiveness of the procedure is currently being assessed by its users among our patients.

Conflict of interest: No conflict of interest

NO017
An Educational Intervention to Enhance the Nursing Staff Awareness to Chimeric Antigen Receptor T-Cell Therapy Toxicity Profile

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Background: Immunotherapy using T cells genetically engineered to express a chimeric antigen receptor (CAR) is rapidly emerging as a promising new treatment for hematological malignancies. CAR-T-cells therapy can induce impressive clinical responses, but is associated with potentially fatal acute toxicities, including cytokine release syndrome (CRS) and neurotoxicity. In the Bone Marrow Transplantation (BMT) department at our center, more than 200 transplants are performed annually. Furthermore, other immunotherapyÂ´s, including administration of tumor-infiltrating lymphocytes for malignant melanoma, are given. The introduction of CAR-T cells to our service warranted adaptation of the existing clinical infrastructure, to cope with the challenges associated with this treatment.

Assessing the impact of an educational intervention on the nursing staff familiarity with CAR-T administration protocol, related toxicity profile and its clinical management.

Methods: A training program was developed for the caregiver team, which included the following contents: familiarity with the CAR-T protocol, guidelines for early monitoring of complications, and side effects and treatment. An educational program was developed to recognize early signs of side effects and toxicity, and to provide prompt treatment of complications. The nurses were asked to fill in a questionnaire on the various aspects of CAR-T therapy before and after the intervention.

Results: A total of 40 nurses in the BMT department shared questionnaires are with all nursing staff, regardless of years of work or level of knowledge, 30 nurses (75%) were familiar with the CAR-T Therapy and its side effects, after the training program the indices has improved to 34 (85%). Furthermore, 26 (65%) of them knew how to handle them, after training 36 (90%). Additionally, 20 (50%) of nurses knew when they needed to start treatment of side effects, after training 34 (85%).

Conclusions: An educational intervention on treatment with CAR-T cells has improved the nursing staff familiarity with the unique features of this treatment. Prospective trials are warranted to evaluate the impact of such an intervention on patient outcome.

Conflict of interest: no conflect of interest

NO018
Oral Care Survey: European Society Blood & Marrow Transplantation (EBMT), Multinational Association of Supportive Care in Cancer (MASCC) and International Society for Oral Oncology (ISOO)

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Background: Oral problems in the stem cell transplant setting can result in a significant health burden for the individual with serious clinical consequences. The European Society for Blood & Marrow Transplantation (EBMT), the Multinational Association of Supportive Care in Cancer (MASCC) and the International Society for Oral Oncology (ISOO) have been working together for a number of years to support the clinical team to recognise, manage, reduce and minimise the severity of oral symptoms by taking a more proactive approach to this aspect of care. As part of this collaborative working, the organisations carried out a survey of current oral care clinical management.

Methods: Having reviewed existing tools and surveys, a specific oral care management survey tool was developed by experts from EBMT, MASCC and ISOO. The survey was written in English and contained 31 items including profession, clinical experience and specific items about the management of oral care in the HSCT setting, this included advice, pain management and treatments given. The survey was distributed at the annual EBMT meeting and respondents were asked to return completed surveys to the EBMT Booth during the meeting.

Results: 71 surveys were completed by nurses (68) and doctors (3) from 19 countries. Clinical experience ranged from 1–41 years (mean 16.5). 35% respondents had been working in HSCT for over 15 years and 83% of respondents worked with adult patients. Nurses and haematologists were

reported as being most involved with the management of oral complications, respondents reported minimal access to specialist dental support and advice. 24% of respondents reported that that the patient was not routinely provided with either a dental or oral assessment before starting treatment. However, (89%) agreed or strongly agreed that a dental practitioner should perform an oral/dental assessment before starting treatment. 70% felt that oral pain was addressed correctly and only 45% of respondents felt that oral care was well managed in their clinical setting centre. Only 66% of respondents said they used oral care guidance resulting in a varied range of oral care practices and treatments being used.

Conclusions: The findings suggest that although respondents were aware of this serious complication in the HSCT setting and practice may have improved, there is still no consistent practice in the approach to the care, assessment, prevention and treatment of oral complications and in some centres management may be based more on anecdotal practice than on existing published guidance. The authors recommend that HSCT teams should review their practice and be encouraged to base their management on the clinical guidance that has been developed by expert groups.

Conflict of interest: No conflict of interest

NO019
Factors Influencing Quality of Life in patients undergoing stem cell mobilization (SCMob) and apheresis: a qualitative explorative study

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Background: Evaluating health related quality of life (HRQoL) improves patient-care by directing supportive interventions, and aiding decision-making (Wakefield 2009). In SCMob for autologous transplant, local guidelines indicate whether lymphoma and myeloma patients are mobilized with growth factors (GF's) alone, or in combination with chemotherapy (CTMob). Mobilization with GF's alone permits outpatient self-administration, however mobilisation and collection is sometimes insufficient. Chemotherapy-based mobilisation has a high yield of stem cells, but greater toxicity i.e. febrile neutropenia (To 2011), and CD34+ cell peaks sometimes unpredictable leading to apheresis scheduling issues. An evaluation of patients perceptions of different SCMob approaches, may assist in informing patient-care and in implementing quality of life supporting interventions.

Methods: A single-centre, qualitative study, was performed to elicit patients experiences of SCMob/apheresis, through semi-structured interviews and use of Framework Analysis. Demographic and SCMob/apheresis procedural data were collected.

Results: 19 patients were interviewed (8 myeloma patients, 11 Lymphoma patients), mean age 51yrs (range 27–73). 7 were mobilized with GF's alone and 12 with CTMob. 4 key themes (and their sub-themes) were identified from the interviews.

1. Emotional factors
    a. Procedure-related - fear of mobilization regime and side-effects (especially CTMob),
    b. Uncertainty of SCMob outcome
    c. Worry of over burdening carers (patient dependence, family become caregivers)
    d. Rationalization
2. Personal functioning and social-role related factors
    a. Role performance - inability to work/study (impact on QoL), economic impact and anxiety,
    b. Inability to enjoy personal hobbies
3. Physical experience related factors
    a. Variety of side-effects (especially CTMob), infections delayed mobilization - disappointment and impact on personal organisation
    b. Pain from GF's (impact on QoL) - a 'friendly' pain
    c. Limited side-effects during apheresis - boredom during procedure

Three patients with multiple myeloma were given a choice of mobilization (GF's vs CTMob), opting for GF's only - due to delayed recovery from CTMob and fear of SE's.

Despite describing experiences during SCMob, the impact on QoL was highly individual and limited, with patients describing the overall pathway as a more influential factor on QoL - not just SCMob and apheresis procedure.

Conclusions: The study provides insight into patient experiences during different SCMob approaches. Significant similarities in key areas were observed, however some differences have been highlighted in terms of fear of potential side effects, the range of side effects experienced and the impact of more prolonged hospital admission were more evident in the CTMob group. Of interest are findings surrounding patient preference for a non-chemotherapy approach where possible. Based on these results, we proposed further longitudinal research is required to investigate

QoL during SCMob in the wider context of the transplant pathway.

Conflict of interest: None of the authors has anything to disclose.

NO020
Positive moves: The impact of clinic relocation on patient experience

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Background: HSCT is complex with considerable risk of morbidity and mortality. Prospective HSCT recipients and their carers attend a pre-transplant clinic appointment to discuss procedural risks and benefits and provide informed consent. With no dedicated clinic allocated, patients were often advised at short notice their appointment location, waited in busy areas providing multiple clinics, subjected to long delays due to lack of space. They frequently missed the opportunity to meet their CNS and were consistently unable to complete Holistic Needs Assessment (HNA) and Care Plan (CP).

Aims:

To improve the pre-transplant clinic experience
To provide a quiet and calm environment
To increase the number of patients meeting their CNS/ Keyworker
To enable completion of HNA and CP

Methods: Our onsite Macmillan Centre has underused consultation rooms. Keen to increase users, they agreed to our patients using the centre for pre-transplant clinics for a 3-month trial period.

Significant stakeholders were identified to enable successful change and met to discuss the proposal, raise potential concerns and answer questions.

A Gantt chart led our project work plan and a risk assessment confirmed the area's suitability for this patient group and was appropriately equipped. We informed clinicians of the launch date.

Patients were asked to evaluate their experience using a self-complete questionnaire following their appointment.

Results: During the 3-month pilot, 31/126 attendees completed the questionnaire and were evaluable. Reasons for non-completion included time, information burden, questionnaire availability

Average age 58 years (range 41–72) with an even gender split (15m vs 16f).

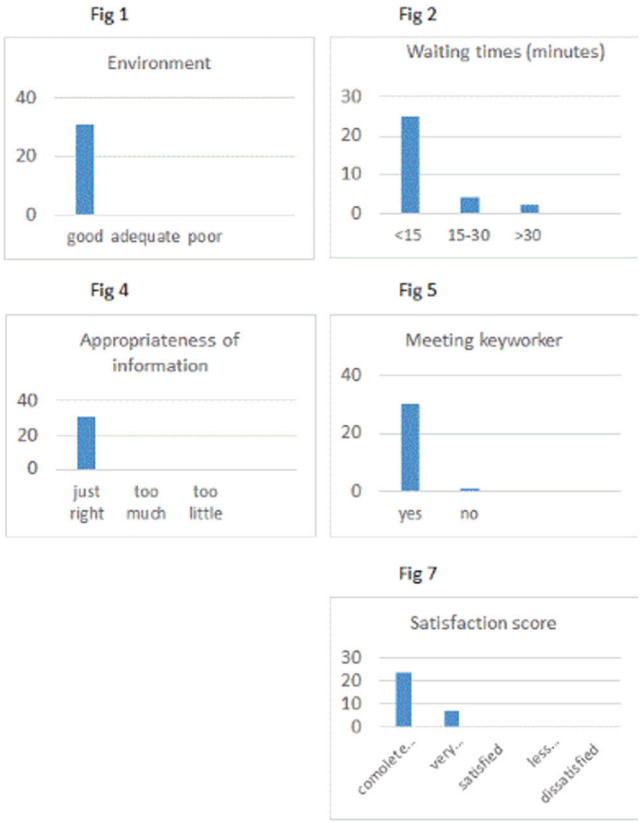
Range of diagnoses were represented; the leading diagnosis lymphoma (n = 15), followed by myeloma (n = 11); leukaemia (n = 2), Multiple Sclerosis (n = 2) and Sickle Cell Disease (n = 1). No patient had a previous transplant.

All attendees rated the environment as good with most waiting 15 minutes or less (fig 1 &2).

100% received written and verbal information and all rated their information as appropriate (fig 3&4).

30/31 (96%) reported meeting their key worker but only 23 (74%) respondents completed HNA (fig 5&6). All attendees were either completely (77%) or very satisfied (23%) with their experience (fig7). We received no negative feedback or suggestions for further improvement in our freetext responses.

[[NO020 Figure] Graphs]



Conclusions: During the pilot, all evaluable patients reported positive experiences of the relocated clinic. Similarly, staff members reported receiving positive reactions from patients regarding experience and felt the environment contributed to achieving the clinic objectives of reducing waiting times, meeting information needs and performing key worker responsibilities. Almost all patients met their

keyworker and while most patients completed HNA and CP in real time, the data also highlighted this as an area for improvement. Evaluation of the patient experience is ongoing and another 3-month snapshot analysis will be undertaken when the new clinic has been operational for 6 months to confirm that recognised improvements are sustained and identify further areas for development.

Conflict of interest: H. Millar: nothing to disclose