Bone Marrow Transplant and Feeding Disorders: A Standard of Care

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Purpose

• Discuss the standard of care provided to pediatric bone marrow transplant patients at CCHMC.
• Discuss evidence-based practice for treating this population.
Overview

• Background information
  – CCHMC Speech Pathology Dept.
  – CCHMC BMT program
  – Referral Process
  – Evidence Based Practice

• The Role of the SLP
  – What is a BMT?
  – Development
  – Feeding

• Current Research
CCHMC
Speech Pathology Department

• Outpatient
  – 7 outpatient satellites, 1 base hospital
  – Clinics: VPI, High Risk, CFAT, GI, Hearing Loss, FEES, VSS, Diagnostic

• Inpatient
  – Base (14 therapist)

• Homecare
  – Service greater Cincinnati and surrounding areas (4 therapist)
Inpatient Speech Pathology

• Base
  – Geographically assigned by unit
    • Floors: Neuro, PICU, TCC, Cardiac, NICU, BMT, hem/onc, GI, ENT, Psych, General, Rehab, Heart Institute.
  – Eval/treatment:
    • Swallowing, Feeding, Speech, Language
  – Competencies
    • Floor and patient population
CCHMC Bone Marrow Transplant

• The Bone Marrow Transplantation Program within Cincinnati Children’s is an international leader.

• Specialize in using transplant therapies to treat cancer and a variety of rare genetic conditions.

• The multidisciplinary team has performed more than 1,300 transplants in the program’s 20-year history — currently more than 100 children each year.

• In 2009, our experts performed 108 transplants, making it one of the largest programs in the United States.
• Program Development
  – Why do we see this population?
Referral Process

- Under 6 developmental referrals
- Feeding/Swallowing
- Speech/Language
- Cognition
- AAC
ASHA

Prevention and Pre-referral

• Speech-language pathologists engage in prevention and advocacy activities related to human communication and swallowing. Example activities include
• improving communication wellness by promoting healthy lifestyle practices that can help prevent communication and swallowing disorders (e.g., cessation of smoking, wearing helmets when bike riding);
• presenting primary prevention information to individuals and groups known to be at risk for communication disorders and other appropriate groups;
• providing early identification and early intervention services for communication disorders;
• advocating for individuals and families through community awareness, health literacy, education, and training programs to promote and facilitate access to full participation in communication, including the elimination of societal, cultural, and linguistic barriers;
Evidenced Based Practice

• Developmental Feeding
  – Children undergoing BMT, regardless of complications, are likely to experience an interruption in their development including their oral sensorimotor development.
  – The introduction of a feeding tube may prevent the child from returning to oral feeding and the experiences necessary to develop these skills.

• Speech/Language Development
  – At risk for deterioration secondary to extended hospitalization.
What is a bone marrow transplant (BMT)?

• “A bone marrow transplant delivers healthy bone marrow stem cells into the patient. It replaces bone marrow that is either not working properly or has been destroyed by chemotherapy or radiation.” – Medline Plus

• Types of BMT:
  – Autologous vs. Allogeneic Transplant

• Types of Chemotherapy:
  – Ablative
  – Non-ablative
  – Reduced intensity
Diagnoses

• Common Diagnoses of BMT patients
  – Bone Marrow Failure Syndrome
  – Immune Deficiency
  – Leukemia
  – Lymphoma
  – Myelodysplastic Syndrome
  – Tumor
BMT Course of treatment

- Pre-BMT
  - Chemo regimen; protocol specific to diagnosis
- BMT
  - Cell infusion
- Post-BMT
  - Engraftment and recovery
  - High risk of complications
  - Significance of 100 days
Pre-BMT: Role of the SLP

- Goals are to maintain adequate oral intake and pleasurable feeding experiences
- Parent education on therapy through the course of treatment
- Work with nutrition to establish goals for caloric intake
- Consideration of previous medical and feeding history
- G-tube considerations prior to transplant
- Speak in terms of “Day –”
So...what do we do prior to transplant?

- **Assessment**
  - establish a baseline of skills
- **Parent Education**
  - What to expect
- **Build rapport**
  - Families and patient
- **Establish positive mealtime structure/routines**

- Feeding Plan: [Will Feeding Plan.docx](#)
During BMT: Role of SLP

• Cell Day
  – Infusion
• Day 0
The Acute Phase

• Day 0 – Day +21
  – Pain, fatigue, energy
  – Therapy??
  – Feeding plans

• Length of admission

• Re-admission

• The goal is maintenance!

• Feeding Plan: oral stim plan Ethan.doc
Post-BMT: Role of SLP

- Pleasurable oral experiences as appropriate.
- Consider the effects of supplemental nutrition.
- Low bacteria diet
- Work with RD to create *Windows* of opportunity for eating.
- Steroids
- PCA - weaning
- Parent education
- Speak in terms of “Day +”
Progress begins...sometimes

- Day 21+

- Standard approaches to feeding and swallowing intervention are implemented during the treatment sessions and may include:
  - behavioral therapy
  - oral motor therapy
  - position and postural changes
  - changes in food and liquid attributes
  - pacing of feedings.

- Feeding Plan: [Will Feeding Plan 2.doc](#)
BMT and Feeding issues

- Taste perception
- Nausea and emesis
- Mucositis
- GVHD
- Age at time of transplant or age at which oral feeding commences.
- Extended supplemental nutrition
  - 27% of the CCHMC population sample required a tube 100+ days after bone marrow transplant.
Development

• “Lock down”
• Limited typical interactions
• Shorter, more frequent, flexible sessions.
• Patients can receive OT, PT, speech, recreational therapy, Child Life.
• Co-treating

• Development Plan: Emily Dev. Plan.doc
Day Hospital/Clinic

Homecare

- Outpatient
- Homecare
Feeding Disorders in the BMT population at CCHMC

- What types of feeding and swallowing problems occur in children during and after BMT?
- Can we identify what children are more at risk for developing feeding and swallowing problems?
Study Design

• Retrospective Study
• 292 charts (2000-2008)
• Various demographic variables
Feeding and Swallowing Problems

• 72 referred during the first 100 days
• 22% (n=16) referred for an instrumental assessment (15 VSS, 1 FEES)
• penetration n=4, aspiration n=4
• Oral-motor deficits in 57% (n=23, missing n=15)
• Feeding disorders in 74.6% (n=44, missing n=13)
Who is most likely to continue with problems?

- Univariate models
  - Age*
  - Tube during first 100 days*
  - GVHD*
  - BMT type*
  - referral for feeding therapy during first 100 days*
  - Type of chemotherapy*

*significant (p<.05)
Final Model

• Stepwise regression
  – age at BMT (OR=.99, .984-.996)
  – type of BMT transplant (OR=.28, .144-.543)
  – placement of a tube during the first 100 days post-transplant (OR=.166, .048-.574)

• Odds ratio
  – <1 is protective, >1 more at risk
Conclusions

- Prevalence
- Risk factors
- Age
- Swallow Dysfunction
- Intervention
- Future Research
References