# Re-conditioning Food as a Reinforcer: Implementing a Feeding Program for a Child with Low Body Weight and Dependency on Nutritional Supplementation

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## 1. CONCLUSION

An evidence-based feeding treatment yielded significant positive outcomes for a 5 year old girl with ASD in comparison to a sensory-based feeding program.

The Sequential Oral Sensory (SOS) Feeding Program had been implemented by a feeding team, led by an OT, for a period of 1 year prior to ABA intervention. Weight gain was minimal and no attempts to reduce or discontinue the bottle feeding were identified as goals. No data was being recorded (other than the family physician tracking weight gain).

Implementation of a behavioural feeding program (treatment package) consisting of the following components:

- Texture manipulation and appetite manipulation
- Escape extinction - non-removal of spoon with re-presentation
- Parent Training and coaching

resulted in an increase in weight from below the 1st percentile to the 9th percentile and a change in food consumption from 100% supplements (i.e., Pediasure) in November 2010 to table food at a chopped fine texture by January 2012.

## 2. INTRODUCTION

Research shows that 46% to 89% of children and adolescents with ASD experience significant feeding difficulties (Ledford and Ghast, 2006). Long term health impacts may include:

- Vitamin and mineral deficiencies (e.g., development of Rickets)
- Reduction in bone development which may lead to osteopenia/osteoporosis
- Disrupted/hindered brain development

Social impacts are also significant:

- Increased stressors to the family
- Reduced social interaction among family members
- Reduced social interaction among peers

Thus, feeding difficulties (i.e., selective/picky eating, decreased quantity of food consumed, texture selectivity, and increased maladaptive behaviours during mealtimes) should be treated as quickly as possible in order to mitigate the health and social risks.

A number of professionals have historically treated feeding disorders—Physicians, Speech-Language Pathologists (SLPs), Occupational Therapists (OTs), Dieticians, Psychologists, and Behaviour Analysts. Often parents and professionals are confused or misinformed regarding the best approach to the treatment of feeding disorders in individuals with ASD. Furthermore, depending upon the professional(s) involved, it can appear that the underlying causes can be related to:

- Physiological issues - gastrointestinal problems
- Sensory processing issues
- Repetitive or ritualistic behaviour (e.g., routine-based)
- Fear and/or anxiety based
- Social positive (attention) and social negative (escape) maintained behaviours

Not only is it important to continue to assess, identify, and report on effective treatments of feeding disorders in the ASD population but it is also critically important to report on ineffective treatments in order to strengthen the available literature and assist with the dissemination of this information to other professionals. The Sequential Oral Stimulation (SOS) Feeding Program is widely used by SLPs and OTs with the belief that it is evidence-based and effective for this population. However, behavioural methods were more effective for this client in increasing weight gain and consumption of table foods.

## 3. MATERIALS AND METHODS

**Participant:** Ashley, aged 4 years, 8 months

- Receiving services through a government-funded Intensive Behaviour Intervention (IBI) program in Ontario, Canada
- Medical Examination and Swallowing assessment were conducted prior to IBI admission
- Body weight - 26 pounds - <1st percentile
- Nutrition Consumption - Pediasure administered via baby bottle; 3 cans per day = 990 calories
- Problem behaviours during feeding - gagging, vomiting, and expulsions
- Other presenting skills - PECS (Phase IV) with beginning acquisition of vocal mands; functional parallel play skills, good imitation skills, high rates of crying behaviour

**Setting:** Small centre-based IBI service delivery with 3 other children in a partitioned room daily (Monday to Friday) from 9:00am to 3:00pm

- Each child's team consisted of a Clinical Supervisor (BCBA), Senior Therapist (BCaBA), and 2-3 Instructor Therapists
- Meals were presented in the therapy area seated on an office chair with a car booster seat for stability
- Food was prepared in advance, including weighing of each food item on an electronic scale and deducting the weight of each container
- Caloric content of each food was calculated and recorded using a Calorie Counter and/or information from the food package

**Procedures:**

*July 2010* - Initial program involved a multi-disciplinary treatment team comprised of the OT and family implementing the SOS Feeding Program in the home and the IBI program implementing the following treatment goals:

- Increase acceptance of various textures of food (thickened liquids and pureed food)
- Increase acceptance of various flavours of thickened liquids and pureed foods

IBI program recorded data:

- Bites accepted and swallowed (recorded and graphed)

*March 2011* - IBI program assumed full control of the feeding program due to slow progress in weight gain and fading in of textures

Treatment goals:

- Increase food consumption and acceptance of solid foods
- Increase functional eating behaviours (biting and chewing)
- Increase texture of foods consumed to Junior Foods (e.g., 1 year baby foods)

Treatment Package:

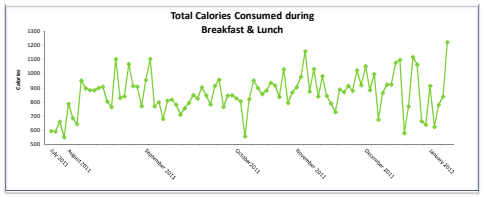
- Escape extinction (non-removal of spoon)
- Skill acquisition program for biting and chewing (imitation program)

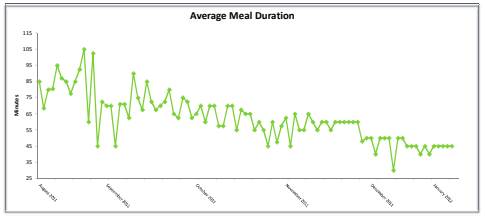
*July 2011* - Increased treatment goals to include increased caloric intake and elimination of the nutritional supplementation in consultation with a dietician.

Treatment Package:

- Appetite manipulation
- Texture manipulation - increase texture of food consumed to chopped fine and table food texture
- Escape Extinction (non-removal of spoon) with Social Reinforcement for acceptance of bites
- Parent Training and Coaching to generalize feeding intervention to the home

## 4. RESULTS


## 5. DISCUSSION

| | Baseline Intervention | Intervention 1 | Intervention 2 |
|---|---|---|---|
| **Weight Gain** | Weight 26 pounds to 30.7 pounds (< 5 pound increase in 1 year) | Weight 30.7 pounds to 34.6 pounds (~ 4 pound increase in 4.5 months) | Weight 34.8 pounds to 38.2 pounds (3.4 pound increase in 5.5 months) |
| **Daily Calorie Consumption at IBI** | ~ 1 can of Pediasure → 330 calories | - 70 to 358 grams of food consumed (calories not calculated) | - range of 551 to 1225 calories |
| **Food Texture tolerated** | • Liquid<br>• Thickened Liquid<br>• Puree | • Puree<br>• First Foods | • Junior Foods<br>• Wet Ground<br>• Chopped<br>• Table Foods |
| **Average Meal Duration** | Not identified as a goal → no data recorded. | Not identified as a goal → no data recorded. | Steady decrease in duration from 105 minutes (1:45 mins.) to 45 minute capped sessions. |
| **Daily Expulsions** | Not identified as a goal → no data recorded. | Significant and rapid decrease in expulsions from a high rate of 270 to a range of 0 to 3 by mid May 2011. | Expulsions have remained at near zero rates since May 2011. |
| **Latency to First Bite** | Not identified as a goal → no data recorded. | Significant and rapid decrease in latency to acceptance from a high rate of 165 seconds (2:45 secs.) to 10 seconds by mid May 2011. | Latency has remained under 10 seconds since May 2011. New foods are also accepted immediately. |

Implementation of a behavioural treatment package was successful in increasing the variety, texture, and quantity of foods accepted.

Collateral behaviours - crying, gagging, vomiting, expulsions- have decreased to near zero rates.

Given that the crying behaviour decreased simultaneously while eating increased, it is hypothesized that the behaviour was maintained by a physiological conditions (i.e., discomfort, abdominal pain). Parents also report that constipation has significantly decreased and success with toilet training has also been noted within all environments.

Food items have now been re-conditioned as reinforcers and can be used within her IBI program.

Chewing skills continue to develop, although these skills remain delayed for her chronological age.

Disadvantages to implementing the feeding program:

- A decrease in acquisition of other skills was noted over the past year, however, previously acquired skills were maintained.
- Feeding treatment programs can be labour intensive and require specific protocols, procedures, and time for food preparation, food safety in handling and storage, and specific training in weight, measurement, and data recording.

## 6. REFERENCES

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