

# New Portable Enteral Pump Technology Allows Individualized Treatment

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A 14-month-old female born esophageal atresia, long gap, requiring tube feedings since 4 days old began an individualized treatment when caregiver requested a diet of blended fresh foods instead of manufactured formula. Challenges included resistance from patient's team of clinicians, consistency of blended foods, and finding a feeding pump that could accurately delivery the viscous emulsion. Gaining agreement, trial-and-error blending methods, and utilization of a new generation portable pump (NGPP, EnteraLite, ZEVEX, Salt Lake City, Utah) resulted in a successful individualized treatment.

## Objective:

The objective of this case study is to demonstrate the impact of a new generation portable pump (NGPP) to clinical outcomes by supporting growth and mobility through adaptability to individual therapies.

## Background:

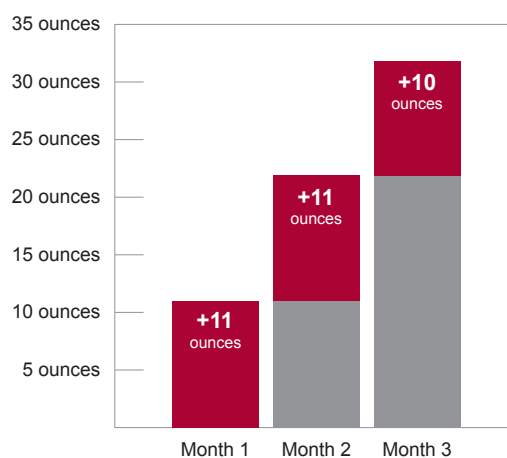
At birth, the patient weighed 4 pounds, 8 ounces and was born to a 36 year old woman, gravida 1, para 1, via emergency C-section. Patient was born with esophageal atresia, long gap (missing 3.5 cm). Various other conditions resulted in a diagnosis of V.A.T.E.R. Syndrome. At 4 days old, the patient received a Percutaneous Endoscopic Gastrostomy (PEG) and began tube feedings.

Nutrition delivery began via a standard, pole mounted feeding pump over 20 hours/day and consisted of human milk. At 5.5 months, human milk was replaced with soy-based formula plus fortifiers. Caregiver was not supportive of manufactured formulas and when patient was 14 months old, the caregiver requested the feeding be changed to a diet of blended fresh food. At the same time, the patient was becoming more mobile.

## Therapy Challenges:

### Gaining Agreement

The patient's team of clinicians including the Gastroenterologist, Surgeon, Pediatrician, and Dietitian were not in favor of a blended food diet. However, based on a recommendation from the dietitian for the patient's recommended daily requirements, the caregiver researched foods and created recipes. The dietitian then



approved the recipes. The patient's Gastroenterologist, Surgeon, Pediatrician and Dietitian gave approval for a four-month trial. During the trial, the patient was evaluated weekly. If weight loss occurred, it was agreed that the patient's diet would revert to manufactured formula immediately.

### Food Preparation

Blending fresh foods created a viscous emulsion containing chunks that caused blockages in the feeding tube. The caregiver resolved this challenge by perfecting the blending processing through trial and error.

### Feeding Pump Technology

The pole mounted pump previously used by patient could not deliver the viscous preparation due to drip chamber design. Furthermore, the patient was becoming more active and mobile. The patient's mobility was limited by being tethered to an IV pole 20 hours/day to receive the feedings. Two first generation portable pumps (FGPP) were tried. Neither could deliver the food. Both pumps also lim-

ited the patient's mobility due to upright orientation requirements. The FGPP were also too large for the patient to carry.

## Therapy Results:

Solution found when caregiver requested that the patient be provided with a new generation portable pump (EnteraLite, ZEVEX Inc., Utah). The NGPP was able to deliver the viscous emulsion with an accuracy of +/- 5%. In addition, barriers to the patient's physical activity were removed because the NGPP operates in any orientation and it small and lightweight, enabling the patient to carry the pump in a backpack.

The challengers were resolved and the blended food trial began. During the trial, patient assessments included blood evaluations resulting in minor adjustments to the recipes. Feeding time was also reduced to 10 hours/day due to the more calorically dense diet, and dumping syndrome was reduced.

Patient weight gain was 11 ounces in month 1, 11 ounces in month 2, and 10 ounces in month 3. At the end of the third month, the team of clinicians concurred the blended fresh food diet was successful.

## Summary:

Six years later, the patient still receives the majority of her nutrition via tube feed blended food diet. Minor adjustments are made to recipes and feeding schedule periodically, based on patient's growth and health status. The blended food diet, successfully delivered by an NGPP, has removed barriers to a physically active, healthy life for this patient.

