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POSTER PRESENTATION

Impact of Keton Based Infant Formula on an Adult Patient for Cardiac PET/CT scan

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Introduction: Cardiac ^{18}F-FDG PET/CT is essential for diagnosing active myocardial infections like endocarditis when echocardiography is inconclusive. To prevent normal heart cells from absorbing glucose and obscuring lesions, patients must undergo a high-fat, ultra-low-carbohydrate ketogenic protocol to force a shift to fatty acid oxidation. While effective, this preparation is a major challenge in critically ill, tube-fed ICU patients due to fluid restrictions, complex metabolic needs, and a lack of commercial adult ketogenic enteral formulas. This case details a novel workaround: adapting a pediatric ketogenic formula (KetoCal 4:1) for 72 hours in a post-CABG adult, demonstrating how to safely adjust pediatric macronutrients to meet adult requirements without compromising clinical stability.

Subjects and method: A male in his early 60s (80 kg) post-CABG presented with a persistent fever of unknown origin, requiring an ^{18}F-FDG PET/CT to rule out infective endocarditis. Because the patient was NPO and dependent on a nasogastric tube, a targeted 72-hour metabolic preparation using a pediatric formula (KetoCal 4:1) was implemented. To meet adult energy needs within a strict 2 L daily fluid restriction, the formula was reconstituted to a 1 kcal/mL density, delivering 2,000 kcal/day (90% from fat) to induce nutritional ketosis. Safety was managed through a rigorous monitoring framework, including 6-hourly blood glucose checks, daily electrolyte and renal panels, continuous ECG monitoring, and regular assessments of gastric residuals and hemodynamic stability. This 72-hour duration served as a strategic safety buffer to achieve maximal myocardial suppression while avoiding long-term adult micronutrient imbalances.

Results: The 72-hour protocol achieved complete, homogeneous suppression of physiological myocardial ^{18}F-FDG uptake, eliminating background "noise" and successfully ruling out infective endocarditis and graft infection. Perfect imaging quality was accomplished (Figure1), despite qualitative urine ketones remaining completely negative, proving that ketonuria is not required for successful cardiac metabolic shifting. The high-fat load was exceptionally well tolerated: the patient maintained stable glycemic control (110–145 mg/dL) without aggressive insulin, normal sinus rhythm with zero arrhythmias, balanced electrolytes, and excellent gastrointestinal tolerance (gastric residuals <50 mL) with total nasogastric tube patency (Table1).

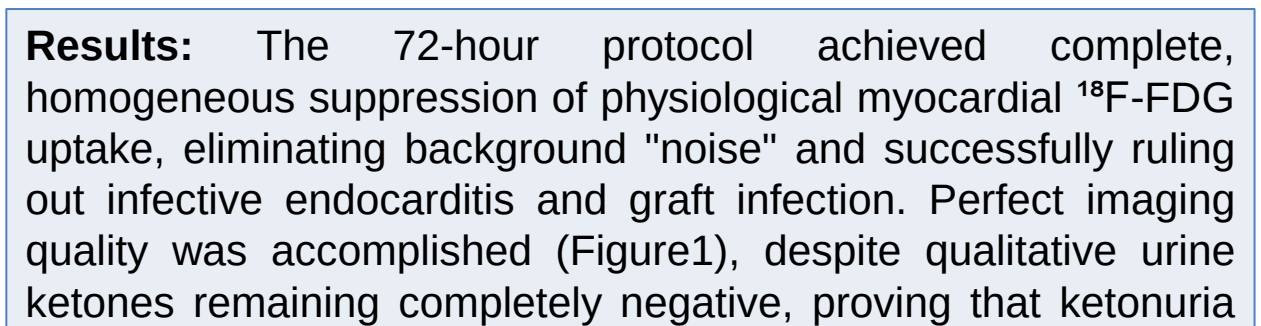


Figure 1: Axial Fused PET/CT Image. Complete, homogeneous physiological suppression of myocardial radiotracer uptake via a lipid-driven metabolic switch (curved green arrow). No abnormal uptake is present at the surgical clips (yellow arrow), successfully ruling out active infective endocarditis.

Table 1: Longitudinal clinical and metabolic readings during the 72-hour ketogenic protocol

Parameter	Baseline (Day 0)	24 hours	48 hours(pre scan)	72 hours(pre scan)	Normal Reference Range
Glycemic control					
Mean blood glucose	158	132	118	124	70-14-mg/dL
Ketosis verification					
Urin Ketosis (Depstick)	Negative	Negative	Negative	Negative	Negative
Electrolytes and renal function					
Serum sodium (mEq/L)	137	139	138	140	135-145 mEq/L
Serum Potassium (mEq/L)	4.1	4.0	4.3	4.2	3.5-5.0 mEq/L
Serum Magnesium (mEq/L)	1.9	2.1	2.0	2.0	1.2-2.2 mEq/L
Serum Phosphate (mEq/L)	3.4	3.2	3.1	3.3	2.4-4.5 mEq/L
Blood urea nitrogen (mg/dL)	18	19	21	20	7-20 mg/dL
Serum createnin (mg/dL)	0.92	0.95	0.98	0.96	0.70-1.30 mg/dL
Hemodynamic and tolerance					
Mean Artial Pressure (mmHg)	78	82	80	81	70-100 (mmHg)
Heart rate (bpm)	84	80	78	82	60-100 (bpm)
Cardiac Arythm (ECG)	NSR	NSR	NSR	NSR	Normal Sinus Rhythm
Gastric residual volume (ml)	N/A	<50	<50	<50	<200

Conclusion: The short-term (72-hour) adaptation of a pediatric ketogenic formula is a hemodynamically and metabolically safe workaround for adult post-CABG patients when adult-specific products are unavailable. Restricting the protocol to exactly 72 hours provided a critical safety buffer, preventing the adult micronutrient, fiber, and protein deficiencies associated with long-term pediatric formula use. Furthermore, reconstituting the formula to a 1 kcal/mL density successfully mitigated high osmolar loads, avoiding gastrointestinal distress, elevated gastric residuals, or diarrhea. The maintenance of stable renal function, balanced electrolytes, and perfect nasogastric tube patency confirms that this protocol safely balances rigorous metabolic preparation with strict adult critical care requirements.