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## Bionutrition Services

Understanding nutrition and nutrient metabolism is vital to many types of research protocols. The CRC staff and facilities support a wide range of nutrition-related research needs. Available services range from simple, convenient food service for study subjects to expert planning, implementation and monitoring complex metabolic balance studies.

The CRC uses computerized nutrient analysis to both evaluate subjects' nutrient intake and to plan study diets that meet exact specifications. The center offers a variety of measurement techniques to assess the nutritional status, estimate the nutritional needs, or evaluate the dietary habits of study participants. The CRC maintains a fully equipped metabolic kitchen, dedicated to the preparation, storage, and dispensing of precision study meals.



The **Bionutrition** Unit's professional staff consists of Jennifer Kilkus, RD, LDN, **Bionutrition** Research Manager; and three full-time registered diet technicians: Gayle Averyheart, Rosemary Burson, and Rowena Marks. The **Bionutrition** Unit assists investigators in planning and conducting the nutritional components of protocols, including literature review, protocol writing, data collection and organization, and reporting results.

### Protocol Consultation Services

- Assist with study design, protocol development and implementation
- Assist with grant and manuscript preparation of nutrition-related studies
- Literature reviews related to nutrition methodologies
- Design various types of metabolic/controlled-nutrient research diets
- Assist with selection of appropriate methods of data collection and develop data collection forms



### Metabolic Kitchen Services

- General hospital meals for inpatients
- General meals for outpatients prepared by the metabolic kitchen
- Calculated and weighed research meals using standard foods (e.g. 30 kcals/kg with 50% CHO, 35% fat and 15% protein) or modified standard foods (e.g. brownies baked with added drug/placebo)
- Weighed research ad lib buffet meals using standard foods (e.g. 3 double-portion entrees, 2 desserts, etc.)

- Calculated and weighed research diets using standard (e.g. 6 g Ensure/kg for use in glucose tolerance test) or modified commercial enteral formulas (e.g. 1200 kcals Glucerna/day with 20 g added protein)
- Calculated and weighed research diets using elemental nutrients (e.g. amino acid beverage with/without tryptophan)
- Recipe development and/or modification
- Monitoring and/or control of fluid intake
- Nutrient controlled weighed diets are specially prepared to promote consistency and accuracy
- Collection and analysis of dietary intake for weighed meals provided by the metabolic kitchen (calculation and analysis of nutrients must be specified)
- Meal aliquot preparation and analysis (analysis is conducted by outside lab)
- Meals can be served at specified times, if requested

### Diet History Data Collection and Analysis

- 24-hour dietary recalls (in person or via phone)
- Food records/diaries
- Food Frequency Questionnaires (general or nutrient-specific)
- Computerized analysis and interpretation of diet history data using ESHA Food Processor

### Clinical and Anthropometric Measurements

- Height and weight
- Body mass index
- Circumference measurements (waist, hip, neck, arm, etc.)
- Skinfold measurements
- Hand grip strength
- Bio-electrical impedance (non-invasive method of determining total body fat, total body water, fat mass and fat free mass using the Quantum X by RJL Systems)

### Indirect Calorimetry

- Resting energy expenditure using the Sensormedics Vmax Encore Metabolic Cart (this is best measured doing a 45-minute fasting measurement)
- Assess the thermic effect of food using a controlled-nutrient diet
- Determine substrate utilization in conjunction with urinary nitrogen measurements

### Diet Education and Counseling

- Provide instruction for research diets

#### DID YOU KNOW?

Bionutrition services are also available for community projects. In a recent project, Jennifer Kilkus, Bionutrition Research Manager, assisted an investigator in creating a Nutrition Knowledge Bowl at a handful of schools on the South Side of Chicago.



Jennifer Kilkus, RD, LDN  
Bionutrition Research Manager

The project involved going to the school and educating the students on various nutrition topics in preparation for the competition. Kilkus also led the students on grocery store tours to discuss the topics of the role of nutrition in cancer prevention. The event was televised and led by Dr. Ian Smith, a nationally recognized physician and health news correspondent.

Protocol-specific nutrition education on diet compliance

- Individual and group nutrition education for long-term nutritional health and lifestyle change
- Development of nutrition education materials

## Bionutrition Rate Schedule

Procedure	Rate (non-industry)	Rate (industry)
General inpatient hospital meal (labor only, cost of tray included with bed day)	\$5.50	\$6.05
General outpatient non-weighed meal	\$11.00	\$12.10
General outpatient non-weighed snack	\$3.30	\$3.63
Calculated & weighed research meals using standard foods (includes High-CHO)	\$27.50	\$30.25
Calculated & weighed research snacks using standard foods	\$8.80	\$9.68
Calculated & weighed research ad lib buffet meals using standard foods	\$220.00	\$242.00
Calculated & weighed research ad lib snack bar using standard foods	\$137.50	\$151.25
Calculated & weighed research diets with modified standard foods (or mineral balance studies)	\$44.00	\$48.40
Calculated & weighed research diets with standard commercial enteral formulas	\$9.90	\$10.89
Calculated & weighed research diets with modified commercial enteral formulas	\$12.10	\$13.31
Calculated & weighed research diets using elemental nutrients†	TBD	TBD
Calculated & weighed ad lib test meal using standard foods (triple portions of eight foods)	\$220.00	\$242.00
Collection & analysis of 3-day diet record	\$66.00	\$72.60
Collection & analysis of 7-day diet record	\$154.00	\$169.40
Collection & analysis of 24-hour dietary recall	\$33.00	\$36.30
Collection & analysis of food frequency questionnaire (FFQ)*	TBD	TBD
Collection & analysis of nutrient-specific FFQ‡	\$28.60	\$31.46
Collection of dietary intake from inpatient non-research hospital meal	\$5.50	\$6.05
Aliquot preparation for analysis by outside lab	\$49.50	\$54.45
Aliquot analysis by outside lab†	TBD	TBD
Anthropometric measurements (circumference, skinfold thickness), cost per measurement	\$5.50	\$6.05
Bioelectrical impedance analysis (BIA)	\$16.50	\$18.15
Hand grip strength	\$4.40	\$4.84
Indirect calorimetry (45 minute fasting)	\$126.50	\$139.15
Indirect calorimetry (4-hour postprandial)	\$214.50	\$235.95
Nutrition assessment	\$38.50	\$42.35
Review of diet and compliance with protocol requirements (DTR)	\$5.50	\$6.05
Education for compliance with protocol requirements (RD)	\$16.50	\$18.15
Education for long-term nutritional health and lifestyle change	\$38.50	\$42.35

\*This will vary depending on the type of questionnaire used – ask for pricing. †Additional cost will apply if a nutrient-specific FFQ needs to be created – cost listed is for analysis of an existing nutrient-specific FFQ ‡Cost will vary depending on nutrients analyzed – ask for pricing

**\*\*All rates effective June 1, 2013 through May 31, 2014.\*\***

[Click here to download a printable PDF of all rate schedules.](#)

The [Bionutrition](#) Research Manager is available to educate and counsel study participants on nutrition-related matters. For more information, you may reach the [Bionutrition](#) Research Manager at 773-702-3012 or [jkilkus@bsd.uchicago.edu](mailto:jkilkus@bsd.uchicago.edu).

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### Contact Information

#### **Institute for Translational Medicine**

The University Of Chicago  
5841 South Maryland Avenue  
Q301C, MC7100  
Chicago, Illinois 60637  
773.702.6980  
**CTSA UL1 TR000430**