Lessons Learned from Research to Improve Food Environments for Infants & Children in DC

Dietary Patterns to Prevent and Manage Diet-Related Disease Across the Lifespan: A Workshop

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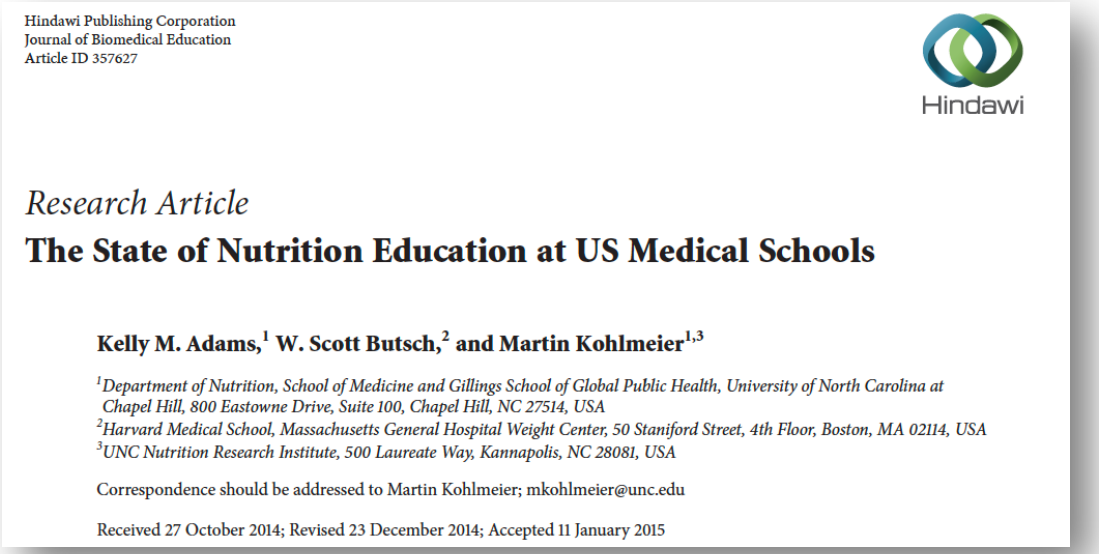
August 16, 2023

No Disclosures

Limited Medical Training on Nutrition

- Majority of medical schools failed to provide the minimum of 25hrs on nutrition (71%, 86/121)
- 36% provided less than ½ of 25hrs of minimum education
- <50% indicated teaching any nutrition in clinical practice



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Research Article

The State of Nutrition Education at US Medical Schools

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Residency and specialties training in nutrition: a call for action[1–4]

Carine M Lenders, Darwin D Deen, Bruce Bistrian, Marilyn S Edwards, Douglas L Seidner, M Molly McMahon, Martin Kohlmeier, and Nancy F Krebs

Nutrition in medical education: a systematic review

Jennifer Crowley, Lauren Ball, Gerrit Jan Hiddink

J Am Coll Nutr. 2008 April ; 27(2): 287–298.

What Do Resident Physicians Know about Nutrition? An Evaluation of Attitudes, Self-Perceived Proficiency and Knowledge

Marion L. Vetter, MD, RD, **Sharon J. Herring, MD**, **Minisha Sood, MD**, **Nirav R. Shah, MD, MPH**, and **Adina L. Kalet, MD, MPH**
Division of General Internal Medicine, Section of Primary Care, Department of Medicine, New York University School of Medicine, New York, New York (M.L.V., S.J.H., M.S., N.R.S., A.L.K.), Department of Medicine, University of Pennsylvania, Philadelphia, Pennsylvania (M.L.V.), Department of Ambulatory Care and Prevention, Harvard Medical School and Harvard Pilgrim Healthcare, Boston, Massachusetts (S.J.H.)

Nutrition Education in Internal Medicine Residency Programs and Predictors of Residents' Dietary Counseling Practices

Journal of Medical Education and Curricular Development
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SAGE

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Summary: *Residents, Fellows, practicing Clinicians* ***don't feel prepared*** *to effectively discuss nutrition with patients for disease prevention or management.*

1st 1,000 Days

The First 1000 Days—A Missed Opportunity for Pediatricians

Kofi Essel, MD, MPH

ABOUT THE AUTHOR

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I remember sitting in front of my four-month-old patient and their family during my pediatric residency and being asked an important question: "Doctor, we want to make sure our child grows up healthy. How do we incorporate solid foods for our baby?" I did not know the answer. I asked for advice from my supervisors and was met with an uncomfortable silence. I realized at that moment that I had failed my patient, and, more importantly, the medical education system had failed to prepare pediatricians like me with the skills necessary to initiate meaningful infant feeding and nutrition guidance for young families during those first 1000 days (i.e., conception to two years). It is a missed opportunity when pediatricians do not receive the necessary education to inform and support families as they set the stage during the first 1000 days for improved nutritional status and healthy eating behaviors over the entire lifespan.[1] It is time for pediatricians to become a stronger voice in advocating changes to policy, curriculum, and cross-collaborative approaches that will advance healthy taste preferences and the dietary intake of infants and toddlers, no matter their culture or income.

MEDICAL SCHOOLS' NUTRITION EDUCATION

The lack of focus on nutrition-related medical education in the United States does a disservice to our children's health. I discovered that the gap in knowledge of child nutrition and infant feeding was common among my colleagues in medical schools and residencies across the country. Graduating medical students report having insufficient nutrition knowledge to support the nutritional needs of patients.[2] In the 1980s, a groundbreaking seminal report recommended a minimum of 25 hours of nutrition education in medical student preclinical years.[3] In 1997, the National Institutes of Health established the Nutrition Academic Award program, ultimately creating a set of comprehensive objectives that continue to guide many curricula around the country.[4,5]

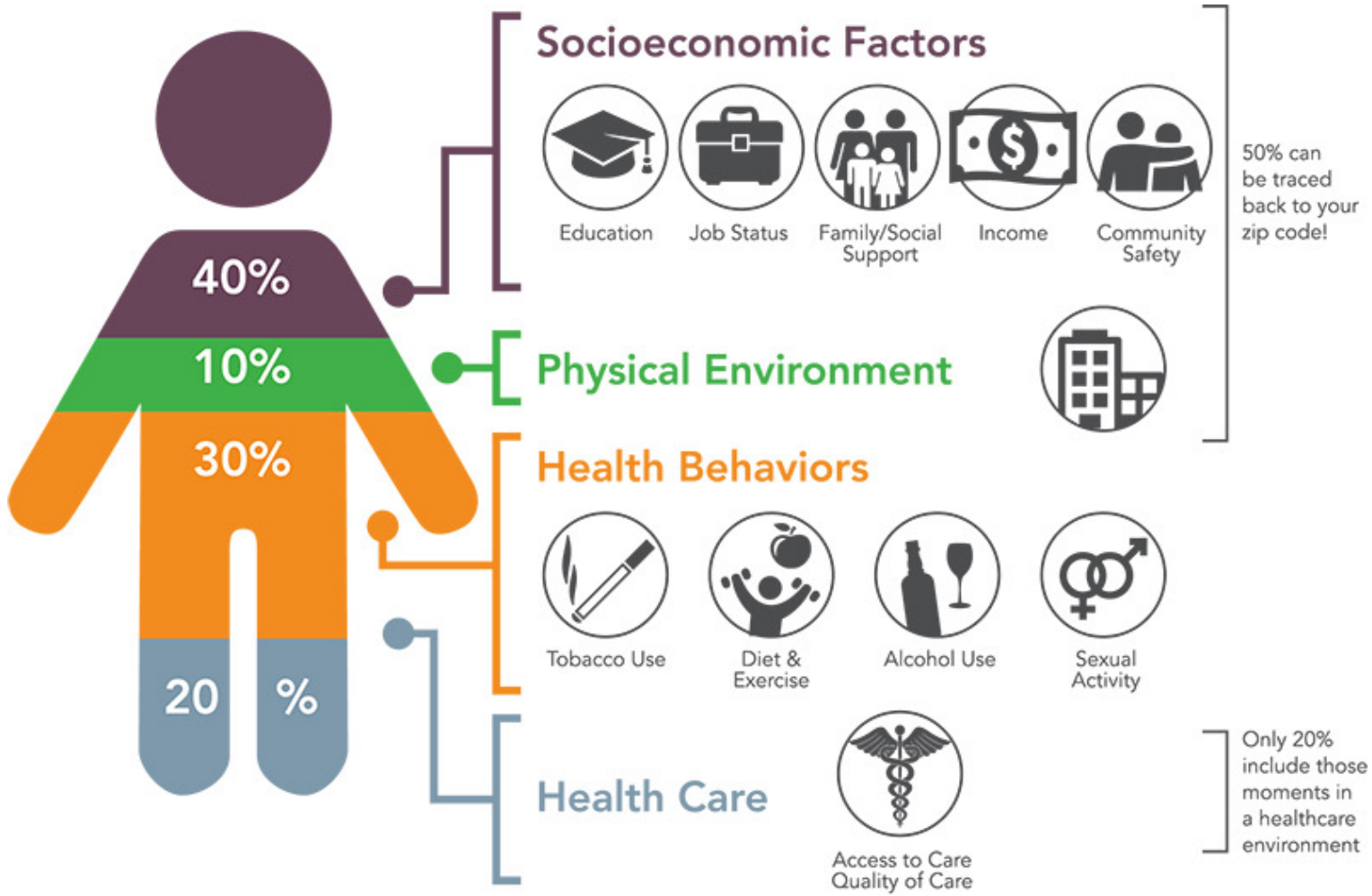
By 2015, 71% of medical schools provided less than the recommended 25 hours, and 36% provided less than half of those hours.[6] As physicians, we recognize that nutrition-related chronic diseases play a key role in affecting the psychological, economic, and physical health of our families and, ultimately, our nation. Poor diets are a leading contributor to worsening morbidity and mortality and are linked to $50 billion in US health care costs.[7] We also recognize that most of our evidence-based national and professional recommendations addressing nutrition-related chronic diseases focus on changes in lifestyle and, more importantly, food and nutrition as fundamental first-line interventions. However, it remains true to this day that medical students across the United States learn the intricacies of biochemistry, metabolism, and macronutrients but lack pragmatic translational science training to counsel patients about food and the impact it has on their health.[6]

Advocating policy changes to enhance nutrition education is necessary for motivating institutions and accreditation bodies to assess and improve training for medical students, residents, and fellows. Most recently, a bipartisan resolution authored by Congressman James McGovern and Congressman Michael Burgess was passed by the House on May 17, 2022. The resolution calls for "substantive training in nutrition and diet sufficient for physicians and health professionals to meaningfully incorporate nutrition interventions and dietary referrals into medical practice" (https://bit.ly/3IVyVsZ). Policy changes, such as the McGovern resolution, are a welcome step toward driving systemic and institutional changes that will ultimately influence the most marginalized patients and families.

EQUIPPING 21ST CENTURY PHYSICIANS

Modern teaching strategies often use experiential learning models. This activity-oriented technique may include small group, case-based, and problem-based learning modules. Institutions may

Case Example



Source: Institute for Clinical Systems Improvement, Going Beyond Clinical Walls: Solving Complex Problems (October 2014)

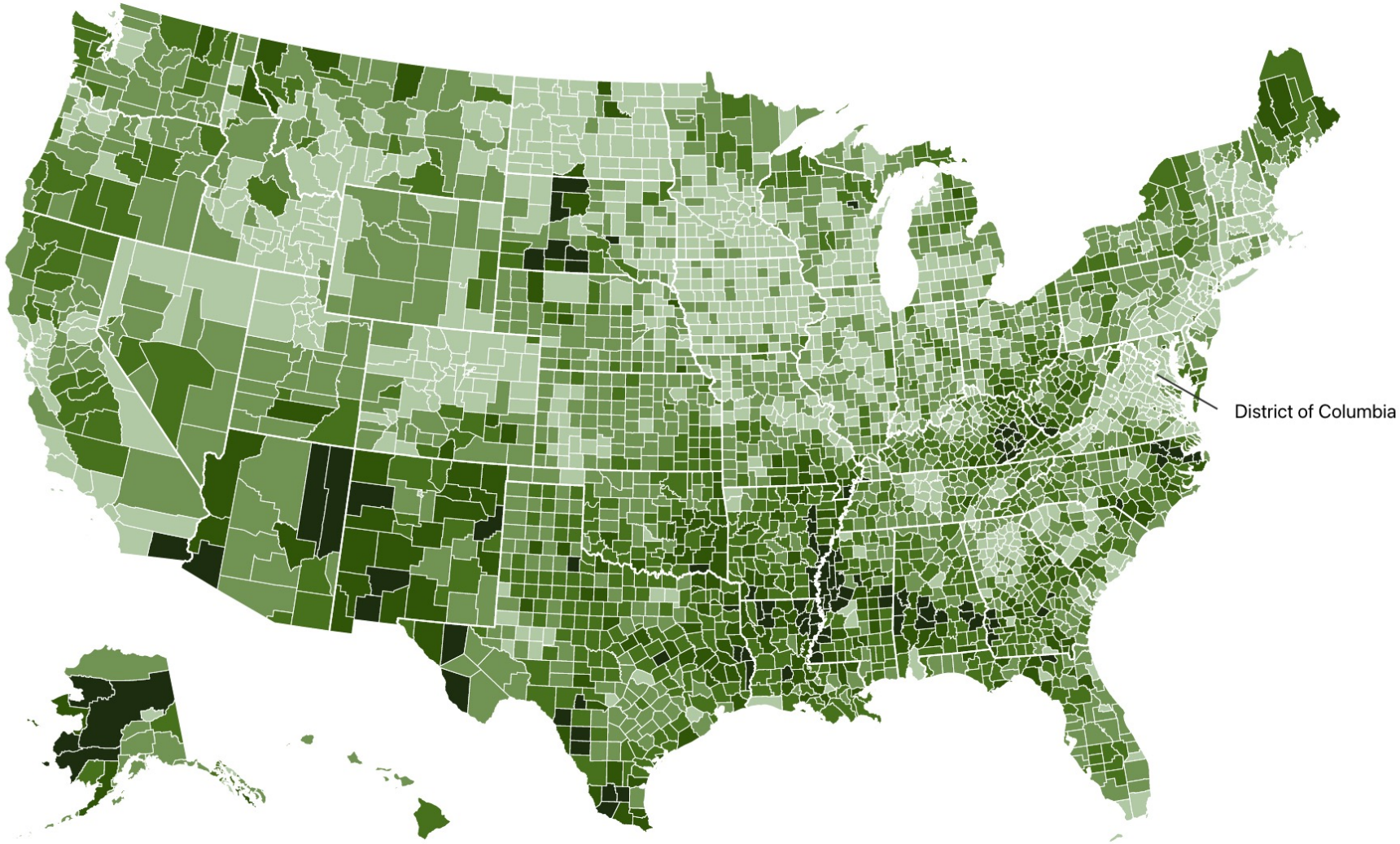
Food Insecurity

Food insecurity describes “the limited or uncertain availability of nutritionally adequate and safe foods, or limited, or uncertain ability to acquire acceptable foods in socially acceptable ways.”

- Core Indicators of Nutritional State for Difficult to Sample Populations, 1990

“Food insecurity is as much about the threat of deprivation as it is about deprivation itself: **A food-insecure life means a life lived in fear of hunger**, and the psychological toll that takes.”

- New York Times, Brenda Ann Kenneally, 2020



Feeding America, Map the Gap, 2020, https://map.feedingamerica.org/county/2019/child

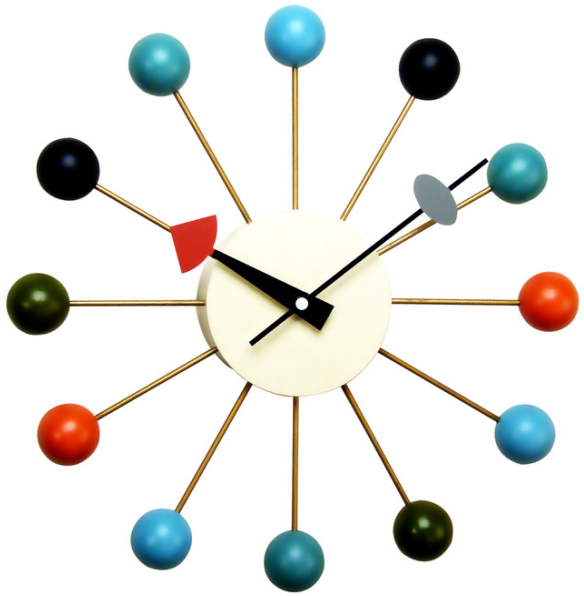
Case Example

A caregiver brings in their 18-month-old toddler for a well child visit in primary care pediatric clinic.

Started solid foods at 3 months with rice cereals in the bottle. Had choking episode and fear caused family to delay expansion of solid foods till 8 months.

Pediatric provider noticed good weight gain and avoided discussion on feeding behaviors at 9 month visit.

Caretaker now reports that child is extremely picky and only drinks juicy beverages and eats a few fruits, waffles, nuggets and macaroni and cheese. The family also will often give "chocolate kids protein shakes" to add more "vitamins & nutrients" to the diet. They acknowledge that they no longer try to broaden child's diet as "it's a waste of time and money."



- **How did we get here?**
- **Are there strategies we could use to support the family to expand the palate when a family experiences food insecurity?**

Repeated Exposure is the Key to Raising Adventurous Eaters

May take 8-15x of trying a food on different days to adapt to the new food item.

ASN

Repeated exposure to food and food acceptability in infants and toddlers: a systematic review

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ABSTRACT

Background: Repeated exposure has been found to be an effective strategy to increase acceptability of foods in older children and adults, but little is known about its effectiveness in the birth to 24-mo population.

Objectives: This systematic review was conducted to examine the effects of repeated exposure to a single or multiple foods on acceptance of those or other foods among infants and toddlers.

Methods: A search was conducted for peer-reviewed articles related to food acceptability, flavor, taste, and infants and toddlers in 12 databases (e.g., PubMed, Embase, Cochrane, and CINAHL) with a date range of January 1980 to July 2017. The Nutrition Evidence Library (NEL) Bias Assessment Tool was used to assess potential bias in the included studies, and the NESR grading rubric was used to grade evidence supporting the conclusion statement.

Results: From the 10,844 references obtained, 21 studies (19 controlled trials and 2 longitudinal cohort studies) published from 1980 to 2015 were included in this review. Moderate evidence indicates that tasting a single vegetable or fruit or multiple vegetable(s) or fruit(s) 1 food per day for 8–10 or more days is likely to increase acceptability of an exposed food (indicated by an increase in intake or faster rate of feeding after comparison with before the exposure period) in infants and toddlers 4–24 mo old. The effect of repeated exposure on acceptability is likely to generalize to other foods within the same food category but not foods from a different food category. Findings are based on the effects of repeated exposure to mostly vegetables with some findings on repeated exposure to fruits.

Conclusion: This review advances the understanding of early food experiences and the development of food acceptability. Additional research is needed using diverse foods and textures with a focus on the transition to table foods. *Am J Clin Nutr* 2019;109(Suppl):978S–989S.

Keywords: complementary feeding, introduction of solids, infants, toddlers, vegetables, fruits, systematic review, food acceptability

Introduction

Early child nutrition is influential in growth and development and can contribute to long-term dietary behaviors and health outcomes (1). The USDA and Department of Health and Human Services initiated the Pregnancy and Birth to 24 Months Project to examine topics of public health importance for women who are pregnant and infants and toddlers from birth to 24 mo of age (1, 2). As part of the project, USDA's Nutrition Evidence Systematic Review (NESR) team, formerly known as the Nutrition Evidence Library (NEL), conducted systematic reviews (SRs) on select topics of public health importance for these specific populations (1–3).

The topic that this article addresses is the relationship between repeated exposure to food and food acceptance in infants and toddlers from birth to 24 mo of age, a time when many new foods are being introduced to the diet (1, 2). The evidence reviewed herein follows from extensive research on older children (4), adults (5, 6), and animal models (7) that showed that repeated exposure to new foods can promote acceptance and increased intake of the exposed foods. Further, because research in older children and adults revealed that new foods and flavors tend to

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Abbreviations used: NEL, Nutrition Evidence Library; NESR, Nutrition Evidence Systematic Review; SR, Systematic review; TEC, Technical Expert Collaborative.

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Am J Clin Nutr 2019;109(Suppl):978S–989S. Printed in USA.

WASTE

Lived Experiences of Households with Food Insecurity

"Food Anxiety"

Basic anxiety or worry about food. Preoccupation with access to enough food.

"Monotony of Diet"

Decrease in Nutritional Quality, Variety, and/or Desirability of diet

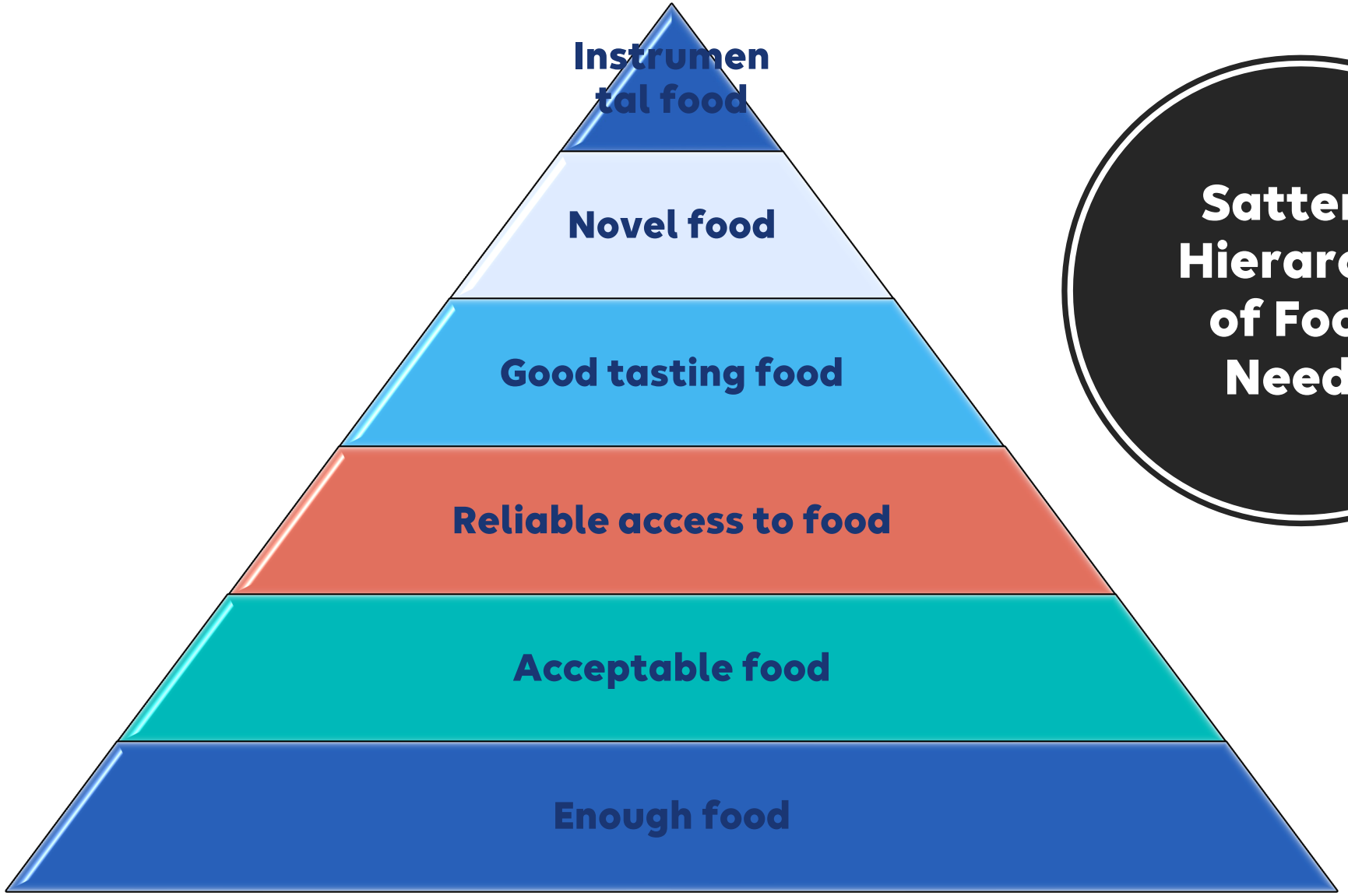
"Adult intake decreases"

Food shortage experienced and adults decrease intake

"Child intake decreases"

Food intake of children decreases

Nord, J Hunger Env Nut, 2013; Fram et. al, J Nutrition, 2011; Alaimo, Top Cli Nut, 2005; Essel et. al, Springer 2018



Satter's Hierarchy of Food Needs

Adapted from Ellyn Satter's Hierarchy of food Needs pyramid. Satter, JNEB, 2007

Parents may give what child wants in order to…

Enjoy seeing child Happy

Habit/Food Jags

Conflict Avoidance and Reduce Stress

Save time at home

Reduce Waste

Infants naturally accept sweet and may often accept salty tastes

Crook,CK, Infant Behav Dev, 1978; Schwartz,et. al, Br J. Nutr, 2009

90% of Adults don't consume the recommended amount of Vegetables

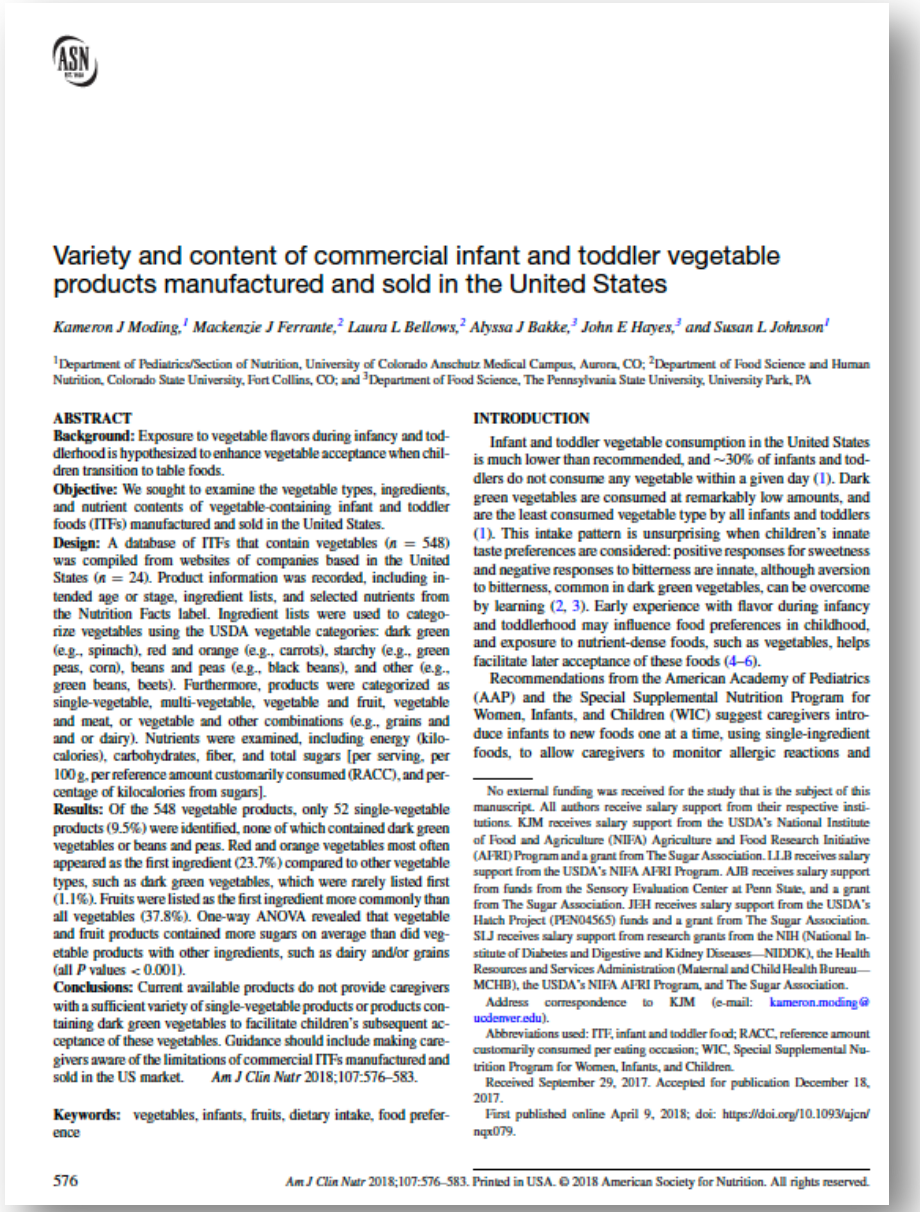
Generational Transfer: Economically & Behaviorally

90% of Children don't consume the recommended amount of Vegetables

USDA DGA 2020-2025, 2020

Commercial Foods for Infants & Toddlers

- Study explored >500 vegetable containing products sold in stores for infants and toddlers
- 52 **(9%)** out of 548 products were single-vegetable products
- Veggie flavors were covered by other flavors especially fruit flavor allowing foods to be sweeter
- None contained Dark Green Veggies



Variety and content of commercial infant and toddler vegetable products manufactured and sold in the United States

Kameron J Moding,[1] Mackenzie J Ferrante,[2] Laura L Bellows,[2] Alyssa J Bakke,[3] John E Hayes,[3] and Susan L Johnson[1]

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ABSTRACT

Background: Exposure to vegetable flavors during infancy and toddlerhood is hypothesized to enhance vegetable acceptance when children transition to table foods.

Objective: We sought to examine the vegetable types, ingredients, and nutrient contents of vegetable-containing infant and toddler foods (ITFs) manufactured and sold in the United States.

Design: A database of ITFs that contain vegetables (n = 548) was compiled from websites of companies based in the United States (n = 24). Product information was recorded, including intended age or stage, ingredient lists, and selected nutrients from the Nutrition Facts label. Ingredient lists were used to categorize vegetables using the USDA vegetable categories: dark green (e.g., spinach), red and orange (e.g., carrots), starchy (e.g., green peas, corn), beans and peas (e.g., black beans), and other (e.g., green beans, beets). Furthermore, products were categorized as single-vegetable, multi-vegetable, vegetable and fruit, vegetable and meat, or vegetable and other combinations (e.g., grains and and or dairy). Nutrients were examined, including energy (kilocalories), carbohydrates, fiber, and total sugars [per serving, per 100 g, per reference amount customarily consumed (RACC), and percentage of kilocalories from sugars].

Results: Of the 548 vegetable products, only 52 single-vegetable products (9.5%) were identified, none of which contained dark green vegetables or beans and peas. Red and orange vegetables most often appeared as the first ingredient (23.7%) compared to other vegetable types, such as dark green vegetables, which were rarely listed first (1.1%). Fruits were listed as the first ingredient more commonly than all vegetables (37.8%). One-way ANOVA revealed that vegetable and fruit products contained more sugars on average than did vegetable products with other ingredients, such as dairy and/or grains (all P values < 0.001).

Conclusions: Current available products do not provide caregivers with a sufficient variety of single-vegetable products or products containing dark green vegetables to facilitate children's subsequent acceptance of these vegetables. Guidance should include making caregivers aware of the limitations of commercial ITFs manufactured and sold in the US market. *Am J Clin Nutr* 2018;107:576–583.

Keywords: vegetables, infants, fruits, dietary intake, food preference

INTRODUCTION

Infant and toddler vegetable consumption in the United States is much lower than recommended, and ~30% of infants and toddlers do not consume any vegetable within a given day (1). Dark green vegetables are consumed at remarkably low amounts, and are the least consumed vegetable type by all infants and toddlers (1). This intake pattern is unsurprising when children's innate taste preferences are considered: positive responses for sweetness and negative responses to bitterness are innate, although aversion to bitterness, common in dark green vegetables, can be overcome by learning (2, 3). Early experience with flavor during infancy and toddlerhood may influence food preferences in childhood, and exposure to nutrient-dense foods, such as vegetables, helps facilitate later acceptance of these foods (4–6).

Recommendations from the American Academy of Pediatrics (AAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) suggest caregivers introduce infants to new foods one at a time, using single-ingredient foods, to allow caregivers to monitor allergic reactions and

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Abbreviations used: ITF, infant and toddler food; RACC, reference amount customarily consumed per eating occasion; WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.

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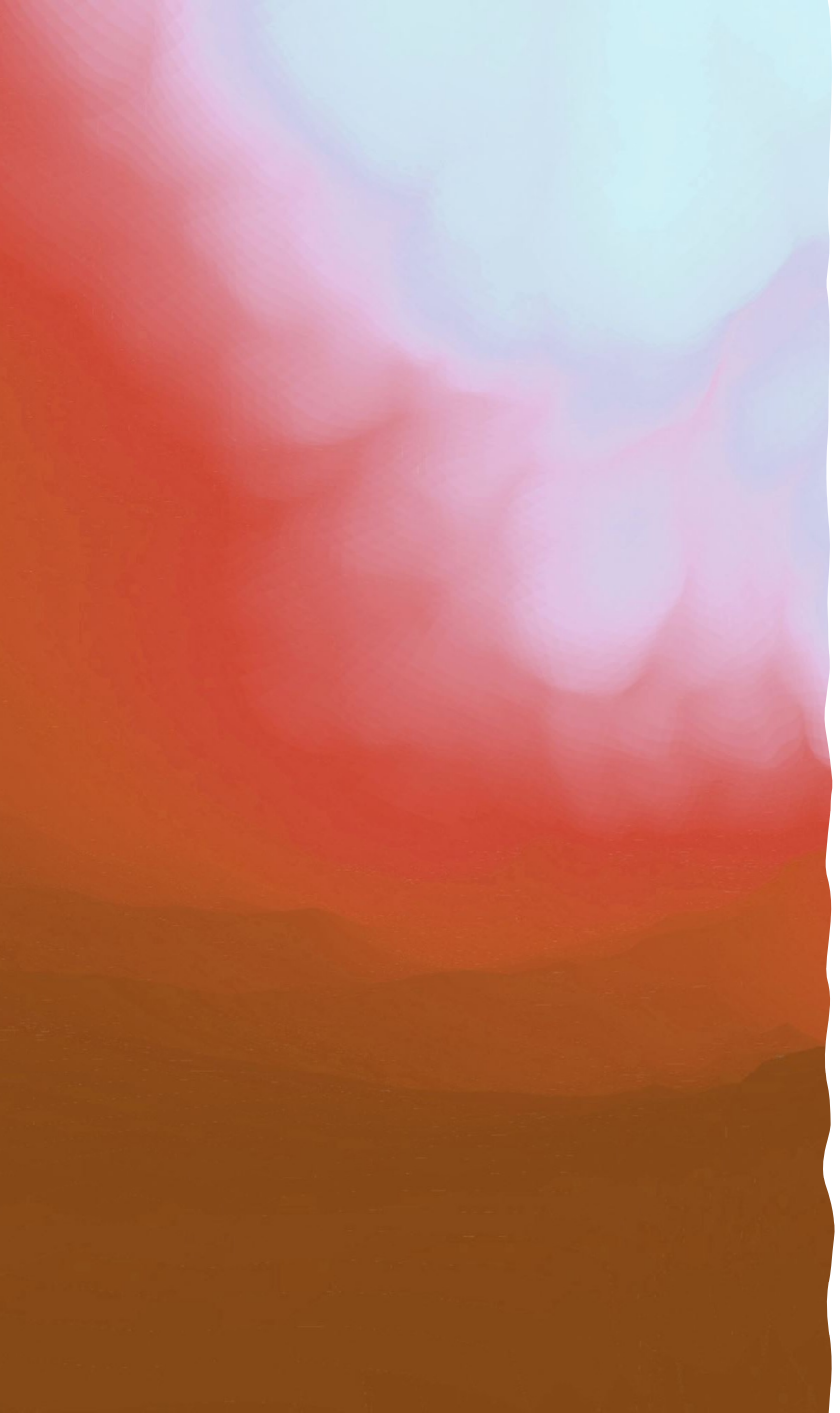
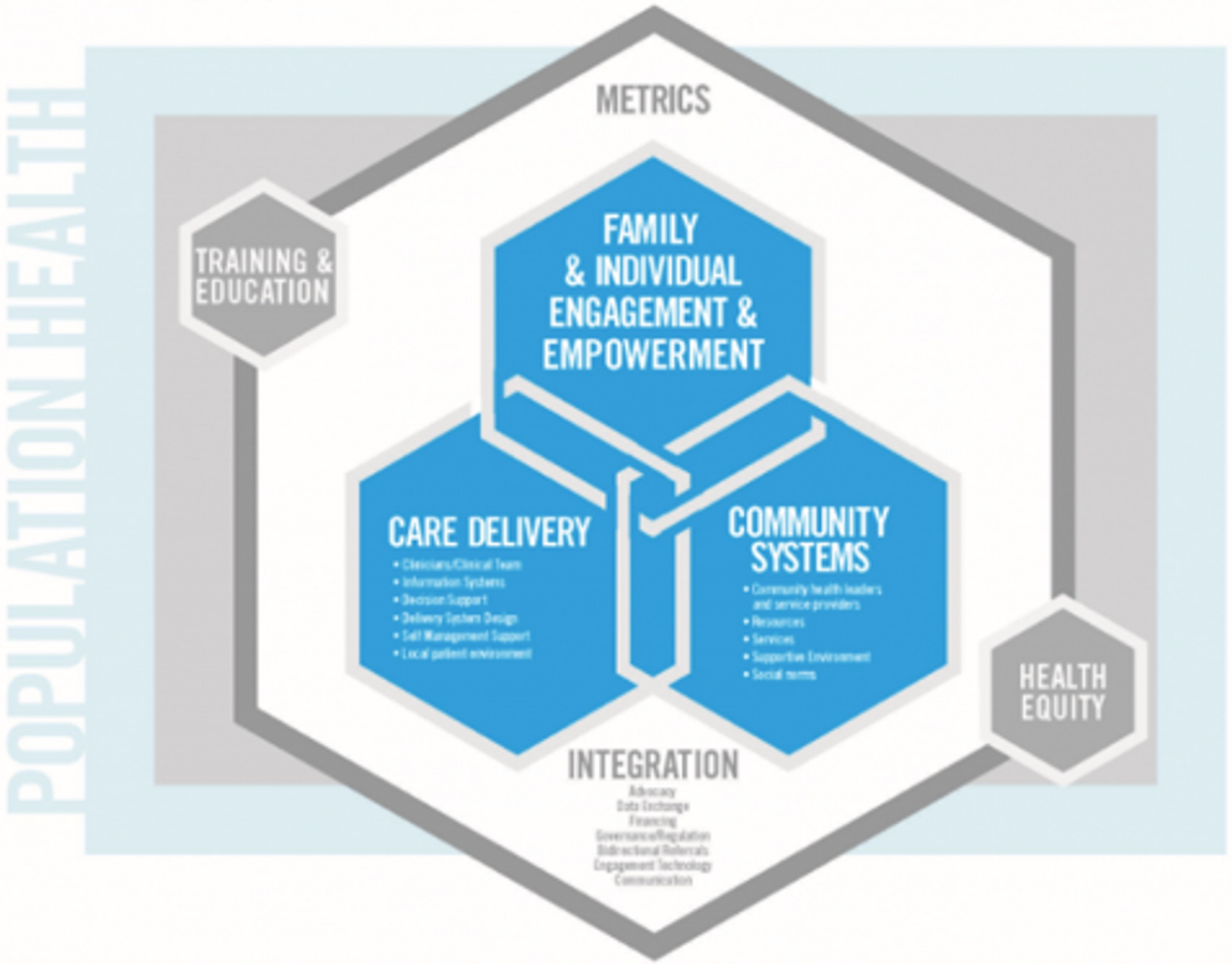


Novel Strategies to Support Families

CLINICAL-COMMUNITY INTEGRATION TO ACHIEVE HEALTHY PEOPLE & COMMUNITIES:

A FRAMEWORK TO OPTIMIZE THE PREVENTION AND TREATMENT OF OBESITY AND IMPROVE POPULATION HEALTH

People are more likely to engage in a healthcare system integrated within their community, where settings and resources reinforce healthy behaviors, provide person-centered care, and undergo continuous evaluation and improvement. Stakeholders recognize their interdependency and act in a coordinated and collaborative fashion to improve health and achieve health equity. This drives behavior change and ultimately helps to prevent and treat obesity and improve population health.



Dietz, et. Al, NAM, 2017

FLiP FAMILY LIFESTYLE PROGRAM

Our Vision:

A District that supports family health and wellness.

Our Mission:

To connect residents to a family-centered lifestyle program that promotes physical activity, nutrition education, and links residents to community resources. We're here to support lasting health for all residents.

Established in 2018 through funding from DCHealth as a family centered community-clinical collaborative focused on addressing food/nutrition security and the prevention and reduction of diet related chronic diseases amongst families in the District.

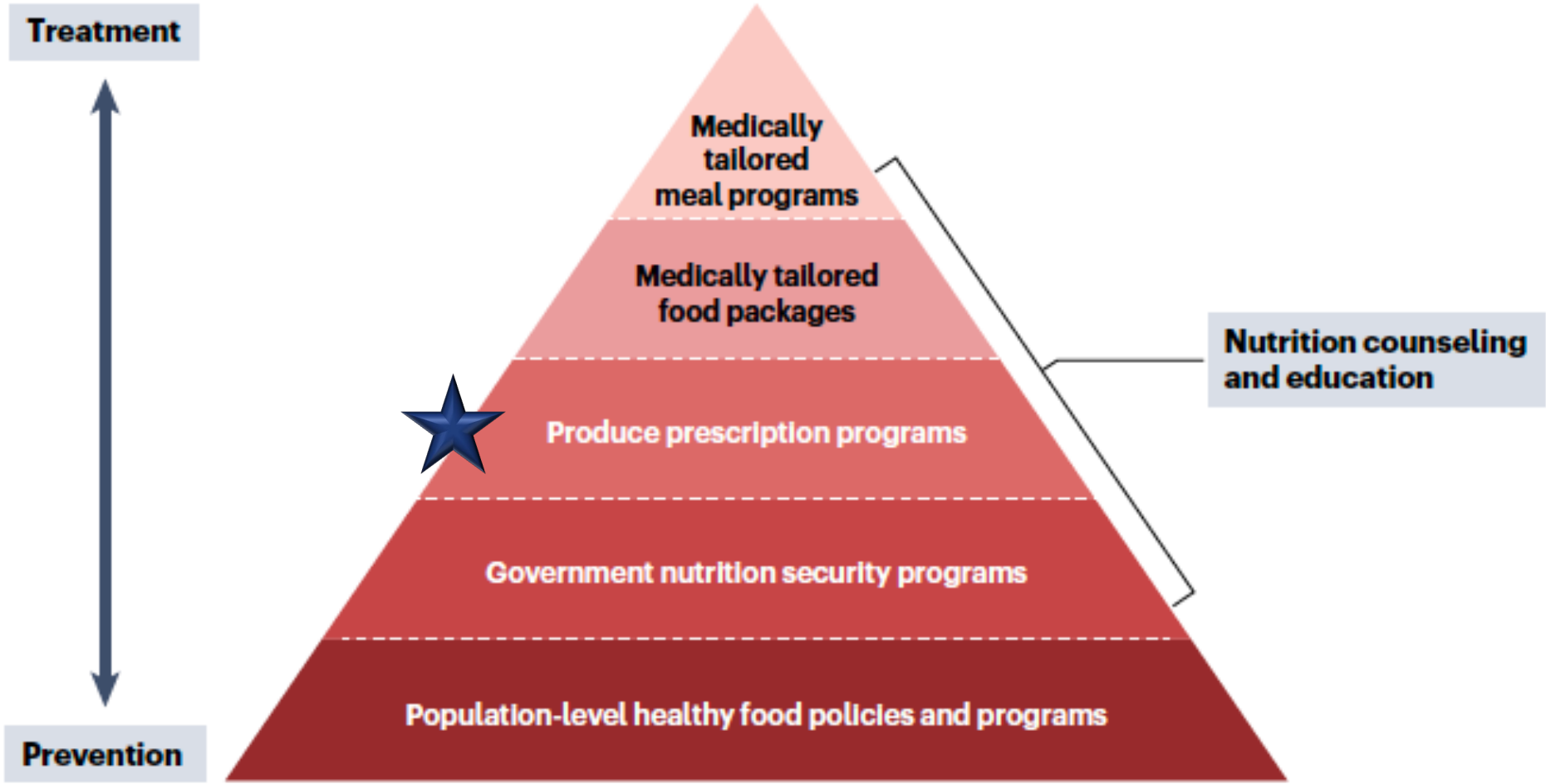


Fig. 1 | The Food is Medicine pyramid. An evolving framework of programs and interventions in healthcare and population health to integrate food-based nutrition interventions at multiple levels for specific health needs of different focus populations. Nutrition security programs include the Supplemental Nutrition Assistance Program (SNAP), Special Supplemental Nutrition Program for Women, Infants and Children (WIC), and school meals. Figure adapted and updated from Food is Medicine Massachusetts (https://foodismedicinema.org/food-is-medicine-interventions).

Mozafarrian, et. al, 2022

“Could food as medicine solutions be used as an intervention to support the health of young children in the first 1,000 days?”

FLiPRx

Produce Prescription Initiative


Produce Prescription Programs may play a beneficial role in increasing diet diversity and quality in families with young children experiencing food insecurity & diet related chronic diseases.

Practical Strategies & Take Home Points

- Caregivers in food insecure households often **offer a more pressured feeding behavior to young children, overall poorer diet quality, and have increased anxiety over wasting foods.**
- **Recognize the challenges** around building expanding taste preferences in households experiencing food insecurity
- Support caregivers by connecting to resources that allow them to **reduce the anxiety of waste** while giving them the opportunity to explore a variety of options.
- Consider **walking up the pyramid/ladder with families**. Building trust, addressing immediate needs and optimizing nutrition security
- Overall being **sensitive** to the challenges around early childhood feeding and recognize the role the whole family can play.

PHA's "Veggies Early & Often Campaign"

- Clinical Handouts designed to support clinicians counsel on nutrition with patient's in the first 1,000 days
- Disseminated January 2023

dr.yumproject

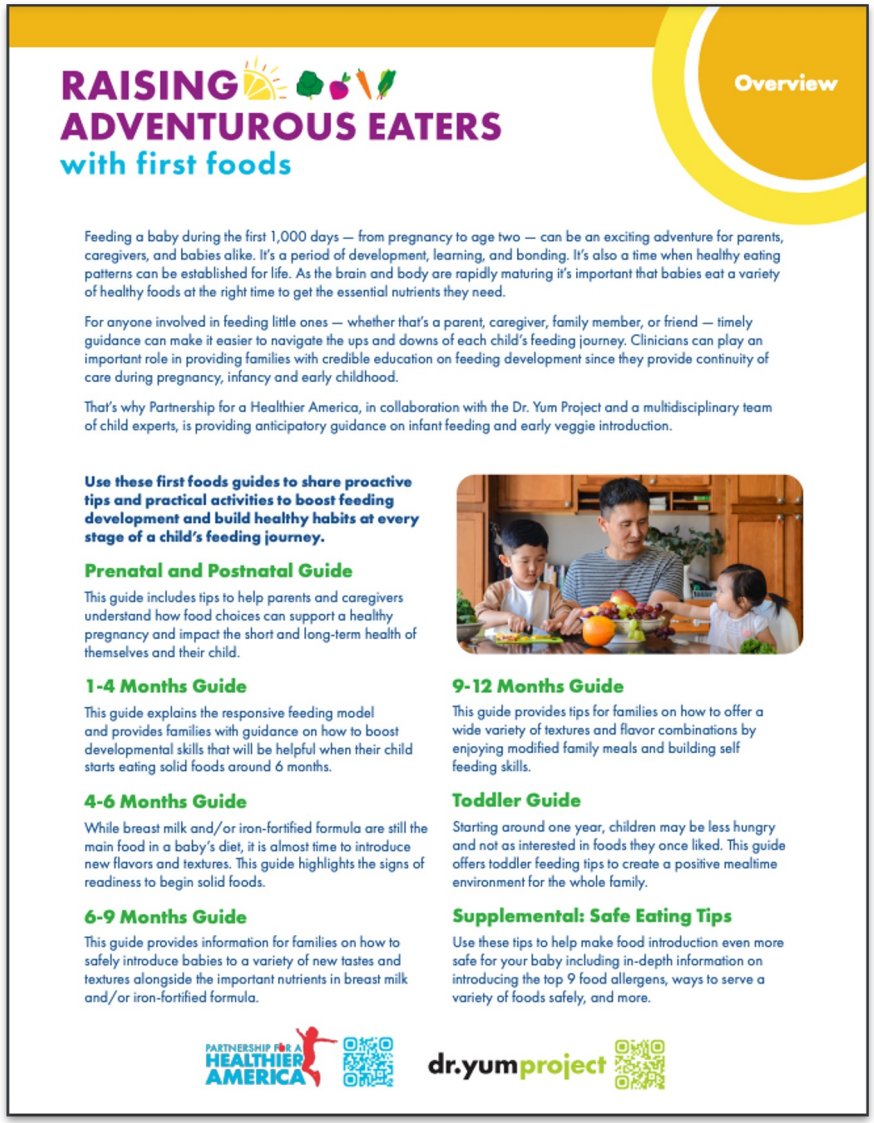
PARTNERSHIP FOR A HEALTHIER AMERICA

Overview guide

Key takeaways

- Series of 7 guides from pregnancy to 24 months of age
- Multidisciplinary team
- Sensitivity review
- Focus groups

RAISING ADVENTUROUS EATERS with first foods


RAISING ADVENTUROUS EATERS
with first foods

Overview

Feeding a baby during the first 1,000 days — from pregnancy to age two — can be an exciting adventure for parents, caregivers, and babies alike. It's a period of development, learning, and bonding. It's also a time when healthy eating patterns can be established for life. As the brain and body are rapidly maturing it's important that babies eat a variety of healthy foods at the right time to get the essential nutrients they need.

For anyone involved in feeding little ones — whether that's a parent, caregiver, family member, or friend — timely guidance can make it easier to navigate the ups and downs of each child's feeding journey. Clinicians can play an important role in providing families with credible education on feeding development since they provide continuity of care during pregnancy, infancy and early childhood.

That's why Partnership for a Healthier America, in collaboration with the Dr. Yum Project and a multidisciplinary team of child experts, is providing anticipatory guidance on infant feeding and early veggie introduction.

Use these first foods guides to share proactive tips and practical activities to boost feeding development and build healthy habits at every stage of a child's feeding journey.

Prenatal and Postnatal Guide

This guide includes tips to help parents and caregivers understand how food choices can support a healthy pregnancy and impact the short and long-term health of themselves and their child.

1-4 Months Guide

This guide explains the responsive feeding model and provides families with guidance on how to boost developmental skills that will be helpful when their child starts eating solid foods around 6 months.

4-6 Months Guide

While breast milk and/or iron-fortified formula are still the main food in a baby's diet, it is almost time to introduce new flavors and textures. This guide highlights the signs of readiness to begin solid foods.

6-9 Months Guide

This guide provides information for families on how to safely introduce babies to a variety of new tastes and textures alongside the important nutrients in breast milk and/or iron-fortified formula.

9-12 Months Guide

This guide provides tips for families on how to offer a wide variety of textures and flavor combinations by enjoying modified family meals and building self feeding skills.

Toddler Guide

Starting around one year, children may be less hungry and not as interested in foods they once liked. This guide offers toddler feeding tips to create a positive mealtime environment for the whole family.

Supplemental: Safe Eating Tips

Use these tips to help make food introduction even more safe for your baby including in-depth information on introducing the top 9 food allergens, ways to serve a variety of foods safely, and more.

PARTNERSHIP FOR A HEALTHIER AMERICA dr.yumproject


Overview

RAISING ADVENTUROUS EATERS
with first foods

Raising Adventurous Eaters with First Foods is an initiative of Partnership for a Healthier America's Veggies Early & Often campaign, in collaboration with the Dr. Yum Project, which aims to raise a generation of adventurous eaters in partnership with health professionals, food manufacturers, and early childhood educators.

For more information, visit www.ahealthieramerica.org/firstfoods

THIS TOOLKIT WAS AUTHORED BY:

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PARTNERSHIP FOR A HEALTHIER AMERICA

About Partnership for a Healthier America

Partnership for a Healthier America is the premier national nonprofit organization working to create lasting, systemic changes that transform the food landscape in pursuit of health equity. PHA develops evidence-based approaches that are implemented in partnership with the private sector, nonprofits, and government, leveraging PHA's assets and the partner's knowledge to accelerate the pace of transformation.

dr.yumproject

About the Dr. Yum Project

The Dr. Yum Project is a pediatrician-led non-profit that empowers families and communities to overcome barriers to eating well through a collection of free tips, activities and recipes, along with curricula for preschools and families.

dr.yum project

PARTNERSHIP FOR A HEALTHIER AMERICA

RAISING ADVENTUROUS EATERS with first foods

1-4 Months Guide

RAISING ADVENTUROUS EATERS with first foods

Feeding a baby during the first

Use these first foods guide tips and practical activities development and build stage of a child's feeding

Prenatal and Postn

This guide includes tips to help understand how food choices pregnancy and impact the sh themselves and their child.

1-4 Months Guide

This guide explains the respon and provides families with gu developmental skills that will starts eating solid foods arou

4-6 Months Guide

While breast milk and/or iron main food in a baby's diet, it new flavors and textures. This readiness to begin solid food

6-9 Months Guide

This guide provides informatio safely introduce babies to a v textures alongside the import and/or iron-fortified formula.

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Understanding your body's needs — for foo empowered personal decisions about your people around you for support to care for y to support a healthy pregnancy and positive

Choose Density

Pregnancy is a crucial time when protein ne for vegetarians/vegans). Consume a wide v for higher energy levels, less nausea, impro preeclampsia (dangerous high blood pressu

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4-6 Months Guide

From four to six months, breast milk and/or iron-fortified formula is still the main food in your baby's diet. Experts recommend starting solid foods at 6 months, but if your baby is showing signs of readiness for "tasting flavors," you can start offering small tastes of pureed foods shortly before 6 months. If your baby does not show these signs, do not start. Wait until your baby is ready.

What are the signs of readiness?

Your baby is ready for small tastes of pureed or smooth foods when they can hold their head up steadily, open their mouth when they see food, sit upright with support in an infant seat or high chair, keep food in their mouth and swallow it, and bring toys or their fist to their mouth to explore.

What is the "flavor window"?

The flavors your baby is exposed to early on can shape their taste preferences for life. As they approach 6 months, babies are highly receptive to a variety of flavors. If you choose to offer some tiny tastes before 6 months, focus on a variety of single ingredient foods, to not hide the flavor with other tastes. Prioritize tastes of veggies, which are often more bitter or savory, to expand your baby's taste palate.

What kind of foods should I offer my baby as they approach 6 months?

Your baby's diet is still mainly breast milk or formula. To begin experiencing flavors of foods, offer your baby a small taste of smooth pureed veggies (such as broccoli, sweet potatoes, beets) and smooth pureed fruits (such as peaches, apples, berries).

Previous recommendations on waiting 3-5 days in between introducing new foods is no longer necessary when offering low allergenic foods such as veggies or fruits. If your baby or family has a history of allergies, talk to your baby's doctor before beginning.. See the 6-9 Months Guide and "Safe Eating Tips" section for answers to common questions about safely starting solids for your baby at 6 months.

How much should my baby be tasting?

When offering foods, think variety not volume. **As your baby approaches 6 months**, food is more for taste exposure, not for calories or nutrients, which your baby is getting from breast milk and/or formula. Offer just one to two teaspoons of a one-ingredient food, to not hide the flavor. Prioritize a variety of veggies. You can offer smooth pureed food on a soft baby spoon or from your clean fingertip.

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ungry. However, after ag oddler, is less hungry and nt as toddlers may need ids.

Fill half your plat with ve

FOR EACH MEAL

CHOOSE 1 - 3:

- VEGGIES: O for maximum e Set a family go
- FRUITS: Fresh, all count! Aim f maximum fiber
- WHOLE GRA to be whole gra bread, brown r whole wheat to

CHOOSE 1 - 2:

- PROTEIN: Egg (turkey, beef, ch tofu, beans & le
- DAIRY*: milk, cottage cheese, yogurt, cheese

RAISING ADVENTUROUS EATERS with first foods

6-9 Months Guide

Now your baby is ready to be a true food explorer! This is the time to introduce many new flavors and textures. With practice, babies will accept these new foods and will ask for more. Simple modifications to family meals is a great way for your baby to build new skills and become an adventurous eater.

What Foods Do I Offer?

- Introduce small amounts of a wide variety of fruits, veggies, proteins, and grains in a rainbow of colors. Fruits and veggies have a low risk of allergic reactions and don't have to be introduced one at a time.
- For detailed information on introducing common high-allergen foods (dairy, egg, peanut, tree nut, soy, wheat, fish, shellfish, sesame), talk to your pediatrician and see the section on "Safe Eating Tips"
- Offer plenty of iron-rich foods like meats, legumes, green veggies, and iron fortified cereals.
- Spices like cinnamon, pepper, curry, garlic powder, and fresh or dried herbs like basil and parsley are a great way to introduce more flavors.
- Continue offering foods many times in rotation. It may take babies 8-10 tries over multiple days or weeks to embrace the flavors of some foods like veggies.
- When using store-bought baby foods, select products with over 50% veggies or single-vegetable purees to help train babies' taste buds. Fruit and veggie blends may hide the flavor of veggies.

LOOK FOR THIS ICON
Products approved to use PHA's icon contain over 50% veggies and no additives.

PHA Veggies Early & Often APPROVED

How Much Do I Offer?

- From 6-9 months, offer 3 meals per day at family mealtimes starting at 2-3 tablespoons of pureed (smoothly blended) or soft foods and gradually reaching about ½ a cup. Remember you are feeding responsively, so it's ok if your baby doesn't eat the full amount. Babies decide how much they'd like to eat and when they are full.
- At this age, it is important that babies have enough hunger for the important calories, fat, protein, and other nutrients from breast milk and/or formula. Consider offering solid foods after or between breast milk or formula feedings.
- Respect your baby's hunger cues. When they turn their face, close their mouth when food approaches, and/or lose interest, they are likely done eating.

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S EATERS

Safe Eating Tips

top priority. Here are safe eating tips to address some of the most s might encounter from the start of introducing solid foods through

fely

by to eat, ask yourself: Can baby break it down easily with just their gums? and thumb? In addition to offering pureed or blended foods, here are 6 ways

HANDHELDS: Larger but very soft pieces held in baby's entire hand to explore and bite (example: chunks of roasted butternut squash)

SHREDDED: Offer moist, tender foods that pull apart easily into tiny shreds. (example: soft cooked ground beef or salmon)

PINKY STRIPS: Soft, moist foods that baby can gnaw and still manage small pieces that break off. Tip! Roll in breadcrumbs to make the food less slippery for baby's grasp. (example: strips of roasted zucchini or avocado)

PEA-SIZED CUBES: Baby will rake up a few soft cubes at this age. Offer soft fresh foods or cooked foods, never offer hard cubes (e.g., hard cheeses) that could lodge in baby's airway if accidentally swallowed whole. (example: kiwi or soft melon)

Year

for food poisoning and severe illness in young children with developing clude honey, deli meats (hot dogs, salami, bologna, deli turkey, etc.), raw or eurized or raw dairy products or cheeses. Items with milk products should say n the label.

of nutrition and hydration in the first year is breast milk and/or infant formula. mounts starting at 6 months. Other types of beverages such as milk, juice, and fered to babies under the age of 12 months.

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9-12 Months Guide

begin exploring a wide variety y meals. Engage your baby in ow to self feed at this age.

Much Do I Offer?

nd 9 months, most babies eat 3-5 small meals acks, spread throughout the day. Offer about ½ p of a variety of foods per meal.

es still need breastmilk or formula for calories nutrition but may be slowly replacing bottles solid food. Consider offering meals or snacks re formula and/or breast milk as your child's est shifts to solid foods.

ember to look for hunger and fullness cues. Trust baby to regulate their own food intake and do pressure them to take more bites.

1-4 Months Guide

ou offer tart eating solid foods

uld my baby eat?

nywhere from 3 to 5 ounces of ula about every 2-4 hours. By to 6 ounces per feeding. After s may start to sleep longer at day. The amount and timing of follow the responsive feeding

v if my baby is

y may be fussiness, opening x that helps the baby turn chest, or bottle nipple), and lip 's cues and learning how your er and fullness is an important g.

No. Babies do not and should not drink water or any other beverages at this time because their kidneys can't easily handle plain water. If they need fluids, they should only be given breastmilk and/or infant formula.

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Thank You!

The First 1000 Days—A Missed Opportunity for Pediatricians

Kofi Essel, MD, MPH

ABOUT THE AUTHOR

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I remember sitting in front of my four-month-old patient and their family during my pediatric residency and being asked an important question: "Doctor, we want to make sure our child grows up healthy. How do we incorporate solid foods for our baby?" I did not know the answer. I asked for advice from my supervisors and was met with an uncomfortable silence. I realized at that moment that I had failed my patient, and, more importantly, the medical education system had failed to prepare pediatricians like me with the skills necessary to initiate meaningful infant feeding and nutrition guidance for young families during those first 1000 days (i.e., conception to two years). It is a missed opportunity when pediatricians do not receive the necessary education to inform and support families as they set the stage during the first 1000 days for improved nutritional status and healthy eating behaviors over the entire lifespan.[1] It is time for pediatricians to become a stronger voice in advocating changes to policy, curriculum, and cross-collaborative approaches that will advance healthy taste preferences and the dietary intake of infants and toddlers, no matter their culture or income.

MEDICAL SCHOOLS' NUTRITION EDUCATION

The lack of focus on nutrition-related medical education in the United States does a disservice to our children's health. I discovered that the gap in knowledge of child nutrition and infant feeding was common among my colleagues in medical schools and residencies across the country. Graduating medical students report having insufficient nutrition knowledge to support the nutritional needs of patients.[2] In the 1980s, a groundbreaking seminal report recommended a minimum of 25 hours of nutrition education in medical student preclinical years.[3] In 1997, the National Institutes of Health established the Nutrition Academic Award program, ultimately creating a set of comprehensive objectives that continue to guide many curricula around the country.[4,5]

By 2015, 71% of medical schools provided less than the recommended 25 hours, and 36% provided less than half of those hours.[6] As physicians, we recognize that nutrition-related chronic diseases play a key role in affecting the psychological, economic, and physical health of our families and, ultimately, our nation. Poor diets are a leading contributor to worsening morbidity and mortality and are linked to $50 billion in US health care costs.[7] We also recognize that most of our evidence-based national and professional recommendations addressing nutrition-related chronic diseases focus on changes in lifestyle and, more importantly, food and nutrition as fundamental first-line interventions. However, it remains true to this day that medical students across the United States learn the intricacies of biochemistry, metabolism, and macronutrients but lack pragmatic translational science training to counsel patients about food and the impact it has on their health.[6]

Advocating policy changes to enhance nutrition education is necessary for motivating institutions and accreditation bodies to assess and improve training for medical students, residents, and fellows. Most recently, a bipartisan resolution authored by Congressman James McGovern and Congressman Michael Burgess was passed by the House on May 17, 2022. The resolution calls for "substantive training in nutrition and diet sufficient for physicians and health professionals to meaningfully incorporate nutrition interventions and dietary referrals into medical practice" (https://bit.ly/3IVyVsZ). Policy changes, such as the McGovern resolution, are a welcome step toward driving systemic and institutional changes that will ultimately influence the most marginalized patients and families.

EQUIPPING 21ST CENTURY PHYSICIANS

Modern teaching strategies often use experiential learning models. This activity-oriented technique may include small group, case-based, and problem-based learning modules. Institutions may

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