

Oral Food Challenges in an Office Setting

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Faculty Disclosure for S. Allan Bock, MD

For the 12 months preceding this CME activity, I disclose the following types of financial relationships:

Honoraria received from: None

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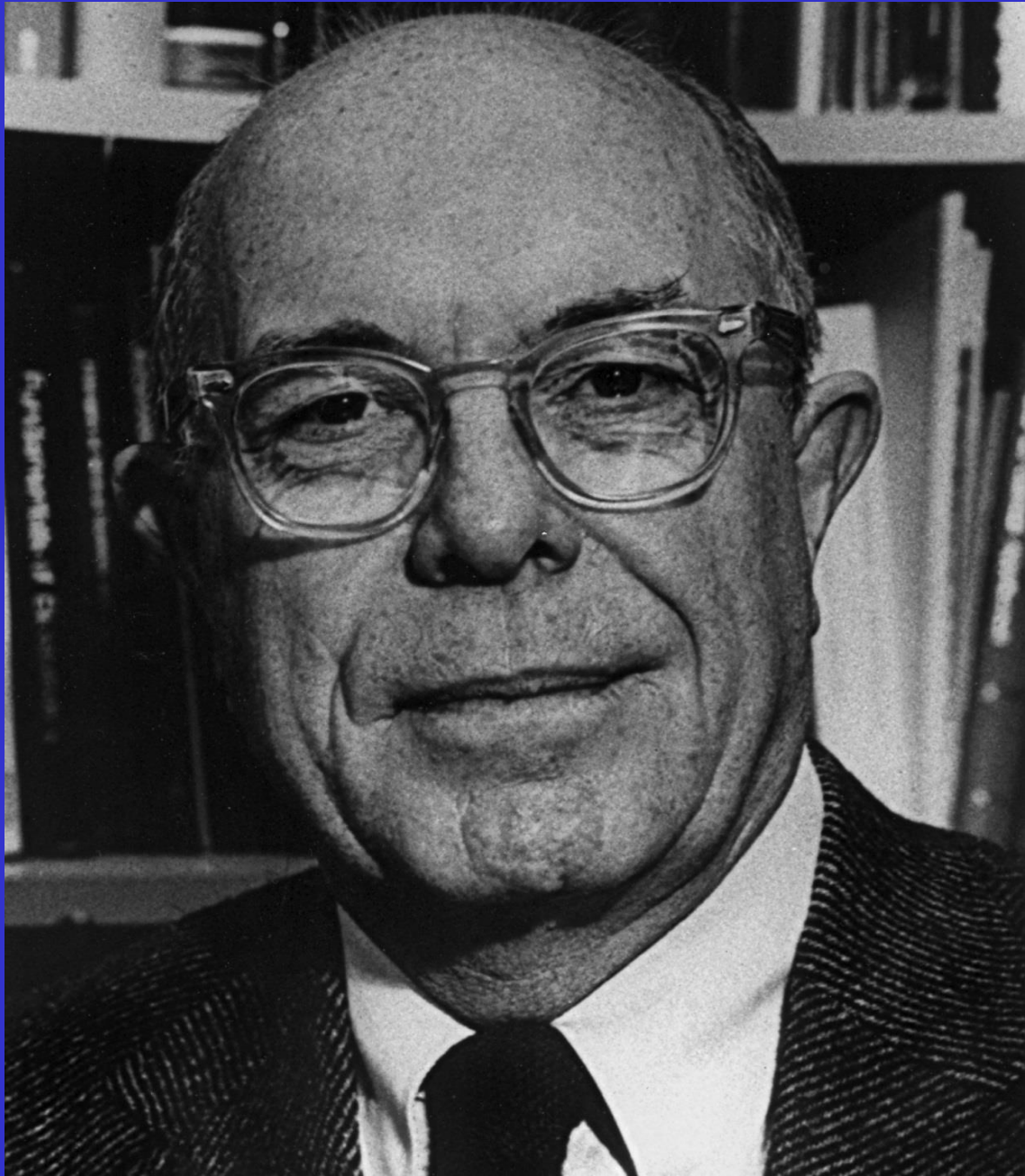
Research, clinical trial, or drug study funds received from:
None

I will not be discussing products that are investigational or not labeled for the use under discussion.



Disclosures

- **Employer: Boulder Valley Asthma and Allergy Clinic**
- **Academic Affiliations:**
- **Consulting Staff in Pediatric Allergy, National Jewish Health, Denver**
- **Clinical Professor, Dept. of Pediatrics University of Colorado, Denver, School of Medicine.**
- **Member: Medical Advisory Board – Food Allergy Research and Education (FARE)**
- **I have no current financial or industry conflicts or relationships to disclose**



No doubt a drop of truth may rarely be tossed up from the depths of a sea of folly, but a dependable means is needed to pick out a drop of sense in a spray on nonsense. For this purpose, the success of the scientific method places it well above empiricism.

Charles D. May, M.D. 1975

[Allergy: Principles and Practice (First edition)]

CHALLENGE GOALS

- To determine if symptoms can actually be produced.
- To reproduce the symptoms as described in the history.
- To determine the dose causing symptoms.

Office Food Challenge Materials

1. A scale (triple beam balance works well)
2. Mortar and pestle; Coffee grinder, food processor

Office Food Challenge Materials

3. Foods (nuts, seeds, spices, dry milk, dried egg white, others)
4. Score sheets
5. Have families bring most of the challenge material and vehicle

Office Food Challenge Supervision

Have a dedicated nurse perform the challenges including:

Weighing and measuring.

Handing out each challenge portion.

Asking about symptoms before each portion is given to subject.

Recording score before each portion.

Notify physician of any symptoms occur.

VEHICLES {Must be *specific* allergen free!}

CAPSULES (rarely)

INFANT FORMULA

APPLESAUCE

NEOCATE ®

MILK SHAKES

CHOCOLATE PUDDING

TAPIOCA FRUIT MIXTURE

GRAPE JUICE

BAKED RECIPES

HAMBURGER

TUNA FISH

ICE CREAM (grape)

POPSICLES

LENTIL SOUP

MASHED POTATO

CEREAL

ELECARE ®

HISTORY TO BE OBTAINED FROM A SUBJECT REPORTING AN ADVERSE REACTION TO A FOOD

- **Description of symptoms and signs**
- **Timing from ingestion to onset of symptoms**
- **Frequency with which reactions have occurred**
- **Time of most recent occurrence**
- **Quantity of food required to evoke a reaction**
- **Associated factors (activity, meds)**

HISTORY TO BE OBTAINED FROM A SUBJECT REPORTING AN ADVERSE REACTION TO A FOOD

- **Be sure to maintain details for each food.**
- **Often patients/parents want to gloss over details saying that each reaction is the same.**
- **When the history is very complex it may be necessary to have the patient/parents work on the details at home. (Pt with multiple problems).**

PHYSICAL EXAMINATION

Look for stigmata of allergic disease:

- **SKIN:** atopic dermatitis, urticaria, angioedema
- **RESPIRATORY SYSTEM:** nose, chest, [eyes]
- **GASTROINTESTINAL SYSTEM**

PLACEBOS {Must be *specific allergen free!*}

Dextrose

Oat Flour

Wheat Flour

Corn Starch

Rice Flour

Formulas

Nut Flours

Safe Fish

Canned Tuna

Safe Meat

PERFORMING CHALLENGES

1. Identify the likely foods.
2. Determine the smallest amount likely to cause symptoms.
3. Use one quarter or less of the suspected amount for the initial dose. [We usually start at .5 gm]

PERFORMING CHALLENGES (CON'T)

- 4. Allow an adequate interval between challenges** (usually 20-30 min for a total of 5 portions)
- 5. Use an adequate placebo** (or not now most docs use open challenge protocols).
- 6. Observe the subject very closely at frequent intervals.**
- 7. Have baseline measurements of vital signs, wt, and spirometry.**

PERFORMING CHALLENGES (CON'T)

- 8. An indwelling intravenous line is rarely necessary.**
- 9. Determine whether exercise / other additional stimulus is a cofactor (alcohol, anti GER meds)**
- 10. Challenge with entire meal (plus stimulus?).**

PERFORMING CHALLENGES (CON'T)

- 11. If single doses over several days are required, give the dose under observation each morning and have the patient return when symptoms occur.**
- 12. If multiple doses over several days are required, give the amount necessary as described by the patient, 2 or 3 times per day.**

OFFICE CHALLENGES

Scoring systems for immediate and delayed symptoms will be different, behavior rating scores may be used.

CHALLENGE INTERPRETATION

Positive: unequivocal symptoms

Negative: food back in the diet

Equivocal: subjective reaction or complaints; reaction too likely to reintroduce food to diet immediately (DBPCFC required)

When the challenge is complete

- Review the results.
- Encourage pt to be with parents or another adult.
- Suggest they go home after challenge.
- If going to school be sure that teacher knows that there was a challenge.
- Epi available (should be brought to challenge visit)
- No further challenge food that day, then into the diet starting the next day.

Foods & Vehicles for Challenges

Food Challenge material Vehicle

Egg	Dried Egg white, Chopped hard boiled egg	Mashed potato, oatmeal, applesauce yogurt, pudding
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Foods & Vehicles for Challenges

Food Challenge material Vehicle

Cow's milk	Non-fat dried milk, Skin milk	Rice, soy milks Infant formula Applesauce Milk-free pudding
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Foods & Vehicles for Challenges

Food Challenge material Vehicle

Wheat	Whole wheat flour, crushed up saltine crackers	Applesauce, oatmeal, rice cereal, mashed potato, chocolate pudding
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Foods & Vehicles for Challenges

Food Challenge material vehicle

Soy	Soy flour, Soy formula	Rice milk, safe formula, elemental formula, cow milk, pudding
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Foods & Vehicles for Challenges

Food Challenge material vehicle

Peanut	Peanut flour (ground or crushed)	Oatmeal, chocolate pudding, Hamburger
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Foods & Vehicles for Challenges

Food Challenge material vehicle

Tree nuts	Crushed suspected nut (preferably from the shell) [not always available]	Peanut butter Chocolate pudding, Hamburger
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Foods & Vehicles for Challenges

Food Challenge material vehicle

Fish/Shell fish	Suspected fish or shellfish	Safe fish “patties” Canned tuna Grape flavored Ice cream
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Challenging Challenges

Food Challenge material Vehicle

Dyes	Food coloring: single/multiple	Capsules Grape juice
Aspartame	Aspartame Equal ®	Capsules
Preservatives	Na Benzoate, BHA, BHT	Capsules

Challenging Challenges

Food Challenge material Vehicle

MSG	MSG powder	Capsules Mixed spices
ETOH (occasional adult subject)	Wine, Beer, straight grain alcohol	Elemental liquid diet

HISTORY = FOOD ASSOCIATED SYMPTOM - NO FOOD SUSPECTED
ELIMINATION DIET

Symptoms Resolve



Regular Diet



No Symptoms Recur



Problems Resolved

Long List of Foods Tolerated



Symptoms Recur



Elimination Diet Repeated



Symptoms Resolve



Add Foods Openly by Food Group



Short List of Food Associated With Symptoms



**DBPCFC for Each Food
(May Use Skin Test First)**

Symptoms Persist



Diet Not the Problem



Food challenges in an office over time

From June 1999 through Nov 2013 we performed food 1254 challenges almost all in children.

These have been done in an office setting and almost all have been open challenges.

Results of 100 office challenges

- Patients 3 to 18 years of age (60% M)
- Positive challenges = 17
- Sensitized patients positive = 15 (88%)
- Non-sensitized pts positive = 2
- Of 83 negative challenges:
 - 52 (63%) sensitized to the food
 - 31 (37%) not sensitized (challenges in off due to risk)

Results of 100 office challenges (con't)

Symptoms: GI, skin, respiratory

Severe symptoms: epinephrine required – 2 pts

1 marked upper respiratory tract symptoms and urticaria during a baked milk challenge.

1 vomiting, urticaria, cough, wheeze, pharyngeal pruritus.

Foods challenged: peanut, tree nuts (not Brazil nut) egg, baked egg, milk, baked milk, shrimp, scallops, lobster, soy, sesame, wheat.

Results of baked egg/baked milk challenges

- 26 baked egg challenges 8 positive (31%)
- Skin test range for positive challenges 3 mm to 15 mm
- sIgE to egg range for positive challenges 0.42 kU/l to 23 kU/l
- 34 baked milk challenges, 14 positive (41%)
- Skin test range for positive challenges 3mm to 15 mm
- sIgE to milk range for positive challenges .35 kU/l to 24 kU/l.
- All pos challenges had pos skin test, all but one positive challenge had detectable sIgE.

Suggested Procedure for home introduction of foods

(deemed safe by both parents and doctor)

- Both parents must be present (or 2 adults)
- Injectable epinephrine on the table (if prescribed)
- Begin with one small bite.
- Increase by a bite (or 2) every 20 to 30 minutes until a reasonable total portion has been consumed (or a reaction has occurred).

Suggested Procedure for home introduction of foods (con't)

- **If no reaction during the introduction phase watch closely for 24 hours and if no problem then begin introduction of the food into the diet regularly and in any acceptable form.**
- **If a reaction occurs treat appropriately (no Benadryl, if antihistamine is needed use Zyrtec [Cetirizine] in the recommended dose). If epinephrine used 911 must be called.**

Suggested Procedure for home introduction of foods (con't)

If there is doubt that a possible reaction is occurring, and it is felt that a trip to ED or urgent care is necessary then both parents (or 2 adults) must go! If the ED is not within a few minutes they should call 911. (If 911 is called from a cell phone, the location must be reported to the EMS.)

**Never underestimate
the power of the
human mind of
aggravate or alleviate
the ills we suffer.**

A few selected references

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- 2. Sampson HA, Gerth VW, Bindslev-Jensen C, Sicherer S, Teuber SS, Burks AW et al. Standardizing double-blind, placebo-controlled oral food challenges: American Academy of Allergy, Asthma & Immunology-European Academy of Allergy and Clinical Immunology PRACTALL consensus report. J Allergy Clin Immunol 2012; 130:1260-74.**
- 3. Fleischer D, Bock SA, Spears GC, Wilson DG, Miyazawa, NK, Gleason MC, Gyorkos EA, Murphy JR, Atkins D, Leung DYM. Oral food challenges in children with a diagnosis of food allergy. J Pediatr 2011;158:578-83.**