Agenda

15 min  Platform overview & introductions, Lindsey Cartner & Haley Oyler

30 min  SETBP1 Simons VIP Registry Update, Dr. Wendy Chung, MD, PhD

10 min  Questions

45 min  Childhood Apraxia of Speech and Other Communication Disorders in SETBP1, Nancy R. Kaufman, MA, CCC-SLP

10 min  Questions

10 min  Working together to understand speech and language in SETBP1, Dr. Angela Morgan

5 min  Questions

End  Meeting ends, the recording ends, line opens for family-only time (as desired by families). All researchers and presenters will leave the call.
To *Provide Support* to the individuals with SETBP1 disorder and their families, 
To *Promote Discussion* and *Fund Research*, and to bring
*Awareness and Education* to the general public

www.setbp1.org
SETBP1 SOCIETY’S FOCUS

Find targeted treatments to improve the quality of life for individuals with SETBP1 disorder

www.setbp1.org
2018 GOALS

• Fund 2 Projects
  ○ Biological Model(s) of SETBP1 disorder
  OR
  Mouse Model
  IPSC Model
  ○ Patient Stories from SETBP1 Families – A Diagnostic Journey Report

How?
From 2017 funds & funds raised through the RARE Carousel of Possible Dreams fundraiser!

www.setbp1.org
2018 ACCOMPLISHMENTS

• Helped Advance 6 Projects
  ○ Biological Model(s) of SETBP1 disorder
    - Mouse Model
      Dr. Cat Lutz (JAX Laboratories)
    - IPSC Model
      Dr. Carl Ernst (McGill University)
      Dr. Simon Fisher (Max Planck)
  ○ SETBP1 Disorder Guide developed by NORD w/guidance from Dr. Bregje van Bon

www.setbp1.org
2018 ACCOMPLISHMENTS

○ 2 SETBP1 disorder Phenotype Studies

SPEECH & LANGUAGE STUDY
Dr. Angela Morgan
(Murdoch Children's Research Institute)

PHENOTYPE PAPER
Dr. Bregje van Bon
(Radboud Medical Center)

How?
From 2017 funds & funds raised through the RARE Carousel of Possible Dreams fundraiser and outside funding!

www.setbp1.org
• SUPPORT SETBP1 DISORDER RESEARCH
  • Fund Dr Simon Fisher’s Human IPSC Model grant for $25K
  • Work with Dr Cat Lutz to develop a SETBP1 mouse model
  • Support Dr Angela Morgan on her speech/language phenotype study
  • Support Dr Bregje van Bon’s work on her phenotype paper
  • Support and fund SETBP1 translational research

• FUNDRAISE
  • Raise $40K in the Million Dollar Bike Ride fundraiser sponsored by the UPenn Orphan Disease Center (ODC)
  • Raise funds in the 2019 Giving Tuesday campaign
• **SUPPORT SETBP1 COMMUNITY**
  • First in person family meetup in Philadelphia, PA - tentatively on Sunday, June 9th

• **SPREAD AWARENESS OF SETBP1 DISORDER**
  • Received a grant for $5K to develop:
    ■ **Information Sheets** for Medical Professionals and Families about SETBP1 disorder in English, French, Spanish and Dutch
    ■ An outreach campaign targeted at key genetic institutions to add SETBP1 disorder to appropriate genetic testing panels (Autism, ID, and possibly Epilepsy)
    ■ A promotional video to help explain what SETBP1 disorder is and how it affects our community
    ■ A small marketing campaign budget to help spread awareness of the disorder

www.setbp1.org
MILLION DOLLAR BIKE RIDE!

Set up your Giving Page & Start Fundraising!

Register Now for Early Registration Benefits
- Low Reg Fee - $25
- Free Cycling Jersey
- Free T-Shirt

More info on our Events page!

Goal: 5 families registered this week!

www.setbp1.org
SETBP1 Family Meeting

Wendy Chung, MD, PhD
Saturday, January 19, 2019
Our Genome

1 Genome in a human

46 Chromosomes in a Genome

20,000 Genes in your chromosomes

23 from Mom

23 from Dad
Not all Genetic Conditions Run in Families

*De novo* mutations are common children with neurodevelopmental problems
When do de novo mutations occur?

- In the egg
- In the sperm
- At or shortly after conception
- No way to know
- Recurrence risk of 1% in future pregnancies
Simons VIP Individuals with SETBP1 Mutation

21 Registered

17 Consented and Labs reviewed

14 pathogenic or likely

10* Medical History before mid-Dec

8 male, 2 female
Ages 3-14 years

* 3 others completed the MHI who had other variants or completed it later
Variants in SETBP1 Mutations Observed
(14 individuals)

<table>
<thead>
<tr>
<th>Protein Change</th>
<th>Number of Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gln89*</td>
<td>1</td>
</tr>
<tr>
<td>Trp274*</td>
<td>1</td>
</tr>
<tr>
<td>Met470*</td>
<td>1</td>
</tr>
<tr>
<td>His523Leufs*32</td>
<td>1</td>
</tr>
<tr>
<td>Gly588Aspfs*42</td>
<td>1</td>
</tr>
<tr>
<td>Arg589Ter</td>
<td>1</td>
</tr>
<tr>
<td>Ser608Alafs*22</td>
<td>1</td>
</tr>
<tr>
<td>Arg625*</td>
<td>1</td>
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<tr>
<td>Arg626*</td>
<td>1</td>
</tr>
<tr>
<td>Ser854Phe</td>
<td>1</td>
</tr>
<tr>
<td>Glu858Lys</td>
<td>1</td>
</tr>
<tr>
<td>Asp874Gly</td>
<td>1</td>
</tr>
<tr>
<td>Asp900Gly</td>
<td>1</td>
</tr>
<tr>
<td>Leu957Pro</td>
<td>1</td>
</tr>
</tbody>
</table>
Fig 1. Genetic and clinical characteristics of individuals with germline SETBP1 mutations and Schinzel-Giedion syndrome.

https://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1006683
### Variants in SETBP1 Mutations Observed
(14 individuals)

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<td>Asp900Gly</td>
<td>1</td>
</tr>
<tr>
<td>Leu957Pro</td>
<td>1</td>
</tr>
</tbody>
</table>
Simons VIP
Medical History and Diagnostic History Data

10 individuals, ages 3 years – 14 years
### Common Developmental and Behavioral Diagnoses (7 individuals)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual disability/Developmental Delay</td>
<td>7</td>
</tr>
<tr>
<td>Autism spectrum disorder</td>
<td>1</td>
</tr>
<tr>
<td>Language disorder/Speech delay</td>
<td>7</td>
</tr>
<tr>
<td>ADHD</td>
<td>4</td>
</tr>
</tbody>
</table>
Language and motor milestones reported in 7 children (age 4-16)

• All 7 children attained first words between age 1 and 5 ½ years

• All 7 children attained first steps between age 1 ½ and 4 years

*1 other family with a different variant also responded
Toilet training milestones reported in 7 children (age 4-16)

- 4 of the children attained bladder control by age 6; others later or not completely.
- 3 of the children attained bowel control by age 6; others later or not completely.

*1 other family with a different variant also responded
*Age 8 reflects all those toilet trained “over age 7”
## Birth Complications

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty Regulating Temperature</td>
<td>1</td>
</tr>
<tr>
<td>Jaundice</td>
<td>3*</td>
</tr>
<tr>
<td>Respiratory distress</td>
<td>2**</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>1</td>
</tr>
<tr>
<td>Admitted to NICU</td>
<td>1</td>
</tr>
</tbody>
</table>
# Newborn Issues

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor suck</td>
<td>5</td>
</tr>
<tr>
<td>Floppy</td>
<td>5</td>
</tr>
<tr>
<td>Feeding difficulties</td>
<td>4</td>
</tr>
</tbody>
</table>
# Eye Conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strabismus (crossed eyes)</td>
<td>1</td>
</tr>
<tr>
<td>Astigmatism</td>
<td>2</td>
</tr>
<tr>
<td>Nearsighted</td>
<td>1</td>
</tr>
<tr>
<td>Farsighted</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
</tbody>
</table>
# Neurological Issues

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low muscle tone</td>
<td>7</td>
</tr>
<tr>
<td>Microcephaly (head smaller than average)</td>
<td>1</td>
</tr>
<tr>
<td>Cerebral Palsy</td>
<td>1</td>
</tr>
<tr>
<td>Movement Disorder</td>
<td>2</td>
</tr>
<tr>
<td>Clumsy</td>
<td>2</td>
</tr>
<tr>
<td>Febrile Seizures</td>
<td>1</td>
</tr>
</tbody>
</table>
# Gastrointestinal Issues

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastric reflux (heartburn)</td>
<td>4</td>
</tr>
<tr>
<td>Constipation</td>
<td>3</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>2</td>
</tr>
</tbody>
</table>
# Infections

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ear infections</td>
<td>7</td>
</tr>
<tr>
<td>required ear tubes</td>
<td>4</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>1</td>
</tr>
<tr>
<td>Medical Condition</td>
<td>Number of Children</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Reactive airway disease/asthma</td>
<td>1</td>
</tr>
</tbody>
</table>
## Kidney, Urinary, Genital Issues

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undeveloped kidney, Hydronephrosis (fluid in kidneys)</td>
<td>1</td>
</tr>
<tr>
<td>Undescended Testicles</td>
<td>3</td>
</tr>
<tr>
<td>Hypospadias (low opening on penis)</td>
<td>1</td>
</tr>
</tbody>
</table>
# Heart Issues

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aortic regurgitation (heart valve floppy)</td>
<td>1</td>
</tr>
</tbody>
</table>
## Endocrine Issues

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problems growing/gaining weight</td>
<td>2</td>
</tr>
<tr>
<td>Short stature</td>
<td>1</td>
</tr>
</tbody>
</table>
## Skin Conditions

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eczema</td>
<td>1</td>
</tr>
<tr>
<td>Rough bumpy skin</td>
<td>1</td>
</tr>
<tr>
<td>Other - Rash at birth</td>
<td>1</td>
</tr>
</tbody>
</table>
# Surgeries

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ear tubes and tonsillectomy and/or adenoidectomy</td>
<td>4</td>
</tr>
<tr>
<td>Orchiopexy (to remove undescended testicle)</td>
<td>2</td>
</tr>
<tr>
<td>Hypospadias repair</td>
<td>1</td>
</tr>
<tr>
<td>Cleft lip/palate repair</td>
<td>1</td>
</tr>
<tr>
<td>Broken Bone</td>
<td>1</td>
</tr>
<tr>
<td>Other (to correct tongue tie and strabismus)</td>
<td>1</td>
</tr>
</tbody>
</table>
### Bone abnormalities

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoliosis (sideways curvature of the spine)</td>
<td>1</td>
</tr>
</tbody>
</table>
## Current Medication Use

(7 individuals)

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Number of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>4</td>
</tr>
<tr>
<td>Stimulants</td>
<td>3</td>
</tr>
<tr>
<td>Non-stimulants</td>
<td>2</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>2</td>
</tr>
<tr>
<td>Antiepileptics (antiseizure)</td>
<td>1</td>
</tr>
</tbody>
</table>
Summary

- Developmental delay or intellectual impairment
- Autism spectrum disorder
- Language delays
- Newborn issues – feeding problems, poor suck, floppy
- Low muscle tone
- Difficulty gaining weight
- Chronic ear infections, ear tubes
- Undescended testicles
Questions & Answers 10 minutes
Childhood Apraxia of Speech and Other Communication Disorders in SETBP1

SETBP1 Virtual Family Conference – January 19, 2019

Nancy R. Kaufman
MA, CCC-SLP
Owner & Director
Kaufman Children’s Center
West Bloomfield, MI
248.737.3430 • kidspeech.com
In SETBP1 there are a spectrum of symptoms ranging from absent speech to expressive language delays, mild-to-severe intellectual disabilities, autism or autistic traits, developmental delays, and ADHD.

My focus today will be upon communication disorders.
Speech-Motor Skills

The behavior of speech involves the mechanics of talking. It entails the integrity of the nerves to innervate the speech muscles, moving the articulators of the jaw, tongue, lips, soft palate, and to coordinate respiration to produce and combine consonants and vowels to form syllables (words). This is a very complex skill.
Why do some children struggle to speak, or to maintain speech intelligibility?

There are two populations who exhibit speech motor challenges that are frequently observed in SETBP1:

- **Children with autism spectrum disorders (ASD)** or traits thereof who are minimally vocal communicators
- **Children with childhood apraxia of speech (CAS)**
Why do some children struggle to speak, or to maintain speech intelligibility?

**Autism spectrum disorders (ASD):** an estimated 30% of children with ASD are nonverbal (Boston University study, October 2018).

- Some of those with ASD have childhood apraxia of speech (CAS)
- Others with ASD may have unintelligible jargon due to difficulty processing and comprehending spoken language
Why do some children struggle to speak, or to maintain speech intelligibility?

- Others with ASD may also exhibit immediate or delayed echolalia (the immediate repetition of the words spoken to them or the use of a script they have heard in the recent past).

In addition to teaching children with ASD the behavior of speech, expressive and social language, they will also need intensive programs for language comprehension and behavioral supports. Applied verbal behavior or applied behavior analysis (ABA) in combination with speech-language therapy would be highly effective for this population.
Childhood apraxia of speech (CAS)

Difficulty executing and/or sequencing the oral-motor movements necessary to produce and combine consonants and vowels and to maintain the motor plans of words on volitional muscle control, resulting in errors in speech sound production and prosody.

A more detailed definition can be found at asha.org (American Speech-Language-Hearing Association, 2007)
Childhood apraxia of speech (CAS)

• Limited repertoire of vowels; less differentiation between vowel productions; and vowel errors, especially distortions
• Variability of errors
• Unusual, idiosyncratic error patterns (sometimes defying transcription!)
• Errors increase with length or complexity of utterances, such as in multi-syllabic or phonetically challenging words.

Source: apraxia-kids.org
Childhood apraxia of speech (CAS)  

- Depending on level of severity, child may be able to produce accurately the target utterance in one context but is unable to produce the same target accurately in a different context.

- More difficulty with volitional, self-initiated utterances as compared to over-learned, automatic, or modeled utterances

- Impaired rate/accuracy on diadochokinetic tasks (Alternating movement accuracy or maximum repetition rate of same sequences such as *puh puh puh* and multiple phoneme sequences such as *puh tuh kuh*)
Childhood apraxia of speech (CAS)  

• Disturbances of prosody including overall slow rate; timing deficits in duration of sounds and pauses between and within syllables contributing to the perception of excess and/or equal stress, “choppy” and monotone speech.

• At some point in time, groping or observable physical struggle for articulatory position may be observed (possibly not present on evaluation, but observable at some point in treatment).

• May also demonstrate impaired volitional nonspeech movements (oral apraxia)
Treatment for those who are minimally vocal/verbal:

Here are techniques specific to what we do at Kaufman Children’s Center as a team of speech-language pathologists, board-certified behavior analysts, and supervised ABA technicians to help those who are minimally vocal/verbal:

• Rapid Motor Imitation Antecedent (RMIA)  
  (Tsiouri, Paul, Simmons, Lewis – 2012)

• Sign to Talk: a method to bridge sign language to vocal/verbal communication, especially for autism spectrum disorders (ASD)  
  (Kasper & Kaufman – 2009 & 2012)
Treatment for those who are minimally vocal/verbal:

• Elements of Oral Placement Therapy (TalkTools®): specifically using tools inside the mouth to gain vowels and consonants into their repertoire. These tools also include Renee Roy Hill’s apraxia shapes.

• K-SLP: Shaping successive approximations toward target words by simplifying the motor plans of words
Teaching sign language as a bridge to vocal communication (Sign to Talk, Kasper & Kaufman – 2009, 2012)

1. Follow the child’s lead and discover their highly preferred items and activities.

2. While the child is showing motivation for the item or activity, playfully block them from obtaining it, and help to shape their hands to make the sign for it.

3. Say the word for the object or activity three times (in a natural voice).

4. Deliver a small quantity of the item (if possible), or allow for short access to the activity.
5. This may have to be done many times until your hands are coming toward the child to help them sign and they produce the sign without help.

6. We would then provide more of the item or activity (such as a bigger chunk of cookie or more time to jump on the trampoline).

7. Eventually, if the child never attempts the word they have heard paired with the sign, stop reinforcing the sign only – the child must vocalize with the sign.
8. Shape the vocalization toward the word through successive approximations.

9. If the child does not vocalize, attempt Rapid Motor Imitation Antecedent (RMIA) training.

Two children who have SETBP1 of whom we are aware have made significant speech motor and expressive language improvement with the Kaufman Speech to Language Protocol (K-SLP).

...or for those who can produce vowels and consonants in isolation, though struggle to maintain production within a context.
The Kaufman Speech to Language Protocol (K-SLP)

The Kaufman Speech to Language Protocol is one treatment method for those with childhood apraxia of speech (CAS) or other speech sound disorders. There are other evidence-based methods for CAS. The K-SLP is one method which has been successful for at least two children known to have SETBP1 and CAS.

The K-SLP is rooted in behavioral shaping techniques and the principles of motor learning. The motor plans of words are initially simplified and shaped toward perfection through reinforcing successive approximations.
The Kaufman Speech to Language Protocol (K-SLP)

For example: *cookie* (if there is no /k/ in the child’s repertoire)

- *tootie*
- *dootie* (if the child cannot sustain devoicing prior to a vowel)
- *cook-ie* (if the child cannot coarticulate /k/ with /i/)
- or many other approximations with the lowest being just the main vowels of the words
- Continuously work on gaining each word perfectly

NANCY R. KAUFMAN, MA, CCC-SLP
The Kaufman Speech to Language Protocol (K-SLP)

Applied verbal behavior teaching strategies implemented within the K-SLP methods

Things to look for in an SLP session:

1. Pairing & establishing motivation
2. Defining the speech and language goals
3. Implementing shaping techniques (successive approximations)
4. Errorless teaching (cuing before failure)
The Kaufman Speech to Language Protocol (K-SLP)

5. Implementing and fading cues (hand cues, gestures, first consonants/syllables, oral postures)

6. Differential reinforcement and error correction

7. Practice schedules for acquisition to retention of new skills (gaining many responses on each goal and ensuring the last responses are independent)

8. Practicing new skills in the natural environment (coaching parents)
Which single words should be taught?

List 1: Syllable shape practice words

Syllable shapes for speech-motor coordination/planning (Kit 1)
CVCV, CV, VCV, CV1CV2, C1V1C2V2, etc.

For those with a limited vowel and consonant repertoire. Make a list of the vowels and consonants at the top of your page. Pull them down into simple words. Have visual references of the words.

If they only have ah, uh, eh, m, b, t, n, we can establish words such as: mama, knot, ton, baba, knob, net, nana (banana), ten, on
Which single words should be taught?

List 2: Simple common nouns

Common nouns of different categories that lend themselves to the ability to then name their function, or add an attribute (round, red, cold, etc.)

- bubbles (blow, round)
- apple (eat, red)
- water (drink, cold, hot)
- ball (throw, kick, bounce)
- shoes (put on, wear)
- bike (ride)
Which single words should be taught?

List 3: Functional manding words

These are functional words which serve to manipulate the environment. They can be paired with a gesture. They are often referred to as *power words*.

- open
- on
- off
- in
- out
- eat
- up
- down
- yes
- no
- don’t
- catch
- here
- there/deh
- this/dis
- that/dat
- go
- draw
- come
- that/dat
- watch
- look
- read
- dada
- mama

NANCY R. KAUFMAN, MA, CCC-SLP
Which single words should be taught?

List 4: Favorites for manding words

- List of favorite foods, drinks, toys, activities, places, people and pets names, and favorite characters.
- If colors, letters, or numbers are of high interest, add them to the favorites list.
- This is where simplification of words is most necessary
Which single words should be taught?

List 5: High-frequency words

• These are words that are often said but don’t fit other categories:
  
  *please*  *get*  *bye*  *thank you*  
  *have*  *awesome*  *see*  *hi*  *wow*  

• Descriptive words such as colors, numbers, size and shape

• Small linking words: articles or auxiliary verbs such as *a, an, the, is, to, are, was*
Which single words should be taught?

Very often, the first words or signs SLPs and parents tend to teach are:

- more
- want
- please
- help
- (all) done
- again

Although initially effective, they begin to lose their power.
Which single words should be taught?

- more
- want
- please
- help
- all done
- again

Unless they are a pivot word in a two-word phrase.

Why?

- Once these words are taught, there may be less motivation to learn additional vocabulary
- The child may only learn that when using these single words, good things will probably happen
Which word combinations should be taught?

Once the child has some consistent word approximations, add words for a two-word phrase, such as *pivot words* (words which remain constant):

<table>
<thead>
<tr>
<th>my</th>
<th>move</th>
<th>draw/paint</th>
</tr>
</thead>
<tbody>
<tr>
<td>open</td>
<td>more</td>
<td>tickle</td>
</tr>
<tr>
<td>help</td>
<td>hi</td>
<td>push</td>
</tr>
<tr>
<td>want</td>
<td>bye</td>
<td>take</td>
</tr>
<tr>
<td>no</td>
<td>red</td>
<td>wash</td>
</tr>
<tr>
<td>on</td>
<td>big</td>
<td>don’t</td>
</tr>
<tr>
<td>tie</td>
<td>hold</td>
<td>eat</td>
</tr>
</tbody>
</table>

Add a person’s name before or after the phrase to engage them: *Mommy open.*
Which word combinations should be taught?

Script functional language with three-word (or more) pivot phrases:

I want __________.
I need __________.
I want to __________.
Can (may) I have __________?
Let me __________.
Put away __________.
Put on __________.
Take off __________.

Pick up __________.
Watch me __________.
Draw a __________.
Tickle my __________.
Come __________ with me.
Can I have a __________?
Where is the __________?
Which word combinations should be taught?

Naming function of objects (S-V-O)

Start with telegraphic language: *I eat apple*

Progress to adding in an article: *I eat an/the apple*
Which word combinations should be taught?

Naming action (S-V-O)

Present an action verb picture and ask the child, *what is the boy doing?*

Starting with telegraphic language, pattern the response: *boy eat apple.*

Move into the appropriate syntax and morphology as the child progresses in maintaining motor plans of words/speech clarity.
Which word combinations should be taught?

Scripting functional language

*Example:* The child turns the doorknob and is unable to open the door.

Say: *Do you want me to open the door?*

(Use the answer words within your question)

Get best approximation for *yes*

Say: *Tell me you want me to open the door.*

Help the child to say *open, open door* (with their best approximations toward perfection)
Which word combinations should be taught?

Teaching syntax, morphology, and general formulation skills to include question and negatives formulation, as well as story telling, and answering questions becomes a focus of treatment.

Using expressive language for conversing and social communication is our ultimate goal.
Here are the two children (both named, John) with whom I have consulted or treated. They both had characteristics of childhood apraxia of speech (CAS) and they both highly benefitted from the Kaufman Speech to Language Protocol (K-SLP)!
John O.

John, who has been diagnosed with SETBP1, is working with Nicole Devens, MS, CCC-SLP, from the Carruth Center in Houston, TX, where I am the consultant for the K-SLP methods.

- Started at age 3.5 working on CVCV reduplicated syllables
- Then at age 5.5 working on simple bisyllabic phrases, final /k/, initial /f/, and requesting to play with a specific toy with a pivot phrase
John O. has hypernasality (air escaping through the nasal passages) which may be due to insufficient velopharyngeal incompetence (VPI).

If there are any questions regarding hyper or hyponasality, it would be beneficial to seek the advice of an ear, nose and throat physician.
John S. was diagnosed with SETBP1

He presented with:

• Characteristics of childhood apraxia of speech (CAS)
• Mixed receptive/expressive language disorder
• Some learning challenges found as he matured
John S.

• He was evaluated by me at the Kaufman Children’s Center at the age of 3 years, 4 months
• He participated in the intensive summer program known as SPEAK for three weeks at the age of 3 years, 9 months
• He returned periodically for four additional 4-day intensive sessions which also included occupational therapy
John S.

What to observe in video clips of John S. with K-SLP treatment:

• Focus on specific single words, such as those that begin with /t/ or /d/ vs. those that begin with /k/ or /g/

• Rescripting his spontaneous communicative attempts

• Coaching his parents through play
The Kaufman Speech to Language Protocol (K-SLP)

For more information on the K-SLP, there is an e-courses through Northern Speech Services (northernspeech.com) and two webinars through Apraxia Kids (apraxia-kids.org).
As speech-language pathologists, we are some of the first professionals to notice dysmorphic features in the children we serve. Although medical referrals are typically the role of the pediatricians, we should not shy away from making the recommendation for genetic testing or bringing our concerns to the pediatricians.

It is our hope to identify more children with SETBP1 early and to understand best practices to treat their communication challenges!
Resources

APRAXIA KIDS: a nonprofit whose mission is to strengthen the support systems in the lives of children with childhood apraxia of speech (apraxia-kids.org)

KAUFMAN CHILDREN’S CENTER: Nancy Kaufman’s clinic for speech, language, sensory-motor, and social connections for information on the K-SLP and video explanations for use of material (kidspeech.com).

NATIONAL AUTISM CENTER: nationalautismcenter.org

NORTHERN SPEECH SERVICES: for K-SLP materials and e-courses to include Nancy Kaufman and Tamara Kasper’s presentations (northernspeech.com)
Resources

TALKTOOLS®: Elements of oral placement therapy and Renee Roy Hill’s apraxia shapes (talktools.com).

THE VERBAL BEHAVIOR APPROACH: How to teach children with autism and related disorders (Barbera and Rasmussen, 2007)
Questions & Answers 10 minutes
Speech and language abilities in individuals with \textit{SETBP1} loss of function variants

Prof. Angela Morgan PhD  
NHMRC Practitioner Fellow  
Lead, Speech & Language Group  
Murdoch Children’s Research Institute (MCRI)  
University of Melbourne  
angela.morgan@mcri.edu.au
Who are the Speech & Language group at MCRI?

- Group in Melbourne Australia who focus on speech & language in children with genetic conditions
- Study speech & language profiles to improve diagnosis, prognosis & develop more targeted therapies
- Focus on clinically based speech pathology examinations to lead to direct clinical recommendations & treatments
- Also work with basic scientists on gene discovery, animal models of speech outcome & pharmacological trials
Speech & language in individuals with \textit{SETBP1} loss of function variants

- Speech or language impairments reported
- Speech production: childhood apraxia of speech, dysarthria
- Language: limited vocabulary & sentence production
- More difficulty with expression than understanding of language (Filges et al., 2011; Marseglia et al., 2012; Coe et al., 2014; Kornilov et al., 2016; Eising et al., 2018)
SETBP1 influences language & reading in the general or LD population

- Links between SETBP1 & language in child language disorder (LD) (Kornilov et al., 2016)
- Links between SETBP1 & reading difficulties trait (Purdue et al., 2018)

No detailed examination of speech & language in individuals with SETBP1 loss of function variants
New study! Aim to understand speech & language abilities in individuals with SETBP1 loss of function variants

Understand specific speech & language profiles

Earlier identification & therapy
Guide management, prognosis
More targeted therapies

Study IRB approved by the Royal Children’s Hospital HREC #37353
What is involved in the speech & language study? When will it start?

Who can take part? All children with SETBP1 LoF variants aged 6 months +

Email contact with Angela (angela.morgan@mcri.edu.au) from today (19th Jan 2019)!

Online survey of health information (20 mins, many languages) from 11th Feb 2019

Online survey of speech & language tailored to age, ability (1 hour, many languages)

Videoconference call (1 hour, English)–parent/guardian/child with Angela

Individual summary reports & overall study results reported back to families
Thankyou & acknowledgements

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Michael Hildebrand, Molecular Geneticist, University of Melbourne (UoM)
Ingrid Scheffer, Neurologist, UoM
Melanie Bahlo, Bioinformatician, Walter & Eliza Hall Institutes (WEHI)
Simon Fisher, Max Planck Institute for Psycholinguistics
David Amor, Clinical Geneticist, University of Melbourne, VCGS, MCRI