1-1-2011

Intervention Intensity for Speech Sound Disorders: How Much and for How Long?

Elise Baker
*The University of Sydney*

A. Lynn Williams
*East Tennessee State University, williamsl@etsu.edu*

Follow this and additional works at: [https://dc.etsu.edu/etsu-works](https://dc.etsu.edu/etsu-works)

Part of the [Speech and Hearing Science Commons](https://dc.etsu.edu/etsu-works), and the [Speech Pathology and Audiology Commons](https://dc.etsu.edu/etsu-works)

Citation Information

This Presentation is brought to you for free and open access by the Faculty Works at Digital Commons @ East Tennessee State University. It has been accepted for inclusion in ETSU Faculty Works by an authorized administrator of Digital Commons @ East Tennessee State University. For more information, please contact digilib@etsu.edu.
Intervention Intensity for Speech Sound Disorders: How Much and for How Long?

Copyright Statement
This document is the intellectual property of the author(s). It was originally published by the American Speech-Language-Hearing Association Convention.

This presentation is available at Digital Commons @ East Tennessee State University: https://dc.etsu.edu/etsu-works/2065
Intervention intensity for Speech Sound Disorders: How much and for how long?

Elise Baker, PhD
The University of Sydney, Australia
A. Lynn Williams, PhD
East Tennessee State University

Seminar Outline

1) What is intervention intensity?

2) What do we know about the intensity of intervention for SSD in children?

3) How might SLPs use the evidence on intervention intensity in their everyday management of SSD in children?
Learner Outcomes

1) **Define** the issues involved in the measurement of intervention intensity,

2) **Describe** what is known about the intensity of intervention, for a variety of phonological intervention approaches.

3) **Identify barriers and solutions** in your conduct of EBP, particularly with respect to the intensity of your intervention for children who have SSD.
1. What is intervention intensity?

*(Based on Warren, Fey and Yoder, 2007)*
Intervention intensity
*(Based on Warren, Fey and Yoder, 2007)*

1. **Dose form**
   
   type of task or activity in which teaching episodes are delivered

   *(e.g., drill play, play)*

2. **Dose**
   
   number of times an active ingredient or teaching episode containing a combination of active ingredients occurs per session

   *(e.g., 100 trials)*
Intervention intensity
*(Based on Warren, Fey and Yoder, 2007)*

3. **Session duration**
   - Length of a session in time
     - (e.g., 50 minutes)

4. **Dose frequency**
   - Number of sessions per unit of time
     - (e.g., 2 x week)
Intervention intensity
*(Based on Warren, Fey and Yoder, 2007)*

5. **Total intervention duration**
   Total period of time in which intervention is provided
   *(e.g., 30 weeks)*

6. **Cumulative intervention intensity**
   Dose x dose frequency x total intervention duration
   *(e.g., 100 trials 3 x week for 30 weeks = 9000 trials over)*
Case example

Cody 4yrs 9 mths (Baker & McLeod, 2004)

- Intervention approach: Minimal pairs therapy
- Intervention target: Initial consonant clusters

INTERVENTION INTENSITY

- **Dose form** = drill play
- **Dose** = 100 trials
- **Session duration** = 45 minutes
- **Session frequency** = 2 x week
- **Total intervention duration** = 12 sessions over 7 weeks
- **Cumulative intervention intensity** = 1,200
Seminar Outline

✓ What is intervention intensity?

→ **What do we know** about the intensity of intervention for SSD in children?
(A) Search for peer-reviewed published evidence

• Peer reviewed published intervention research
  ▫ Extended Baker & McLeod (2011)’s narrative review 134 studies
  ▫ 1979 to 2011

• Search - multiple databases (e.g., ERIC, Medline, CINAHL, Scopus, SpeechBITE, and ASHA’s online journals + hand searches)

• Search term examples
  ▫ phonological intervention / therapy / treatment
  ▫ intervention for phonological or speech sound impairment / delay / disorder

• Identified 148 suitable publications
Year of publication

Average 4.5 publications per year
Levels of evidence (ASHA, 2004)

- **Ia**: 1% Systematic reviews
- **Ib**: 15% Randomized controlled trials
- **IIa**: 10% Non-randomized controlled trials
- **IIb**: 44% Quasi-experimental group and single-case experimental designs
- **III**: 31% Case studies
Service delivery

**FORMAT?**
- 77% individual

**WHO?**
- 86% SLP

**WHERE?**
- 49% university clinic
Intervention intensity across the literature

*(Based on Warren, Fey and Yoder, 2007)*
1. Dose form

type of task or activity in which teaching episodes are delivered

(e.g., drill play)

➢ Difficult to quantify across studies

➢ Clear themes included:

  ▪ Clinician-directed drill play, such as picture naming while playing an activity (e.g., Cummings & Barlow, 2011)

  ▪ Child-directed naturalistic play (e.g., Camarata, 1993)

  ▪ Combination of clinician- and child-directed play (e.g., Tyler et al., 2011)
1. Dose form

Client acts
Examples:
- Speech production trials
- Speech perception trials

Clinician inputs
Examples:
- Conversational recast
- Auditory stimulation
2. Dose

number of times an active ingredient or teaching episode containing a combination of active ingredients occurs per session (e.g., 100 trials)

21% (30/146) of studies provided quantitative information about dose

40% (12/30) were associated with minimal pairs intervention
2. Dose

Dose range within and across studies = 14 to 240 trials per session

100 production practice trials per session
3. Session duration

The bar chart shows the number of studies across different session durations in minutes. A significant number of studies are within the 30-45 minute range, with a notable peak at 30 minutes.
4. Dose frequency

Number of studies

Times per week

- 1 per month
- 1 per fortnight
- 1 x
- 2 x
- 3 x
- 4 x
- 5 x

TUESDAY

THURSDAY
5. Total intervention duration

Total period of time in which intervention is provided (e.g., 30 weeks)

Calculation of total intervention duration was complicated by:

- Continuous vs block schedules across research
- Restricted number of sessions vs open duration (e.g., until criterion, or until speech intelligible)
5. Total intervention duration

Overall

• Mean duration 17.5 weeks *(includes ‘restricted’ and open durations)*

• Range 1 – 184 weeks.
5. Total intervention duration

Articulation therapy (..longest)

Months of intervention from referral to dismissal
5. Cumulative intervention intensity

(e.g., 100 trials 3 x week for 30 weeks = 9000 trials over)

Only 7.5% \((11/146)\) of studies provided sufficient data for cumulative intervention intensity to be calculated

Across those studies:

- average minimum = 1,596.72
- average maximum = 2,135.81

No study reporting outcomes from referral to dismissal provided sufficient information to compute overall total cumulative intervention intensity
So, what do we know about intervention intensity across published peer-reviewed literature?

Dose form: varies ??
Dose: 100 trials
Session duration: 30 - 60 minutes
Dose frequency: 2 - 3 x week
Total intervention duration: 7 - 18 mths
Cumulative intervention intensity ??
Limitations of current ‘peer reviewed’ knowledge base

- Gaps in reporting aspects of intervention intensity, particularly:
  - Dose
  - Dose form
  - Total intervention duration
  - Cumulative intervention intensity unknown

- We need to look to other sources of information
Authors’ recommended intervention intensity for specific approaches came from this textbook:

Interventions for phonologically-based SSD that report data on/or recommend- “How long?”

- Limited phonetic inventory & large collapses of contrast
  - Multiple oppositions (Williams, 2010)
- Limited phonetic inventory & structural phonological difficulties
  - Cycles (Hodson, 2007); PACT therapy (Bowen, 2009)
- Inconsistent speech sound disorder
  - Core vocabulary therapy (Dodd et al., 2010)
- Toddler, with limited inventory and limited stimulability
  - Stimulability approach (Miccio & Williams, 2010)
### Multiple oppositions (Williams, 2010)

<table>
<thead>
<tr>
<th>Dose Form</th>
<th>Dose Form</th>
<th>Session Duration</th>
<th>Dose Frequency</th>
<th>Total Intervention Duration</th>
<th>Cumulative Intervention Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focused stimulation (drill play)</td>
<td>100 trials</td>
<td>30-45 min individual</td>
<td>2x/week</td>
<td>21 sessions (3 months)</td>
<td>2400</td>
</tr>
</tbody>
</table>

**HOW LONG?**

Williams (2000) 10 case studies from referral to dismissal: 25 to 105 sessions (mean = 60 sessions) over 14 months
**Cycles** (Prezas & Hodson, 2010; Hodson, 2007)

<table>
<thead>
<tr>
<th>Dose Form</th>
<th>Dose</th>
<th>Session Duration</th>
<th>Dose Freq</th>
<th>Total Intervention Duration</th>
<th>Cumulative Intervention Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiential -play (drill play)</td>
<td>Time-based (60 min for each target phoneme or cluster within a pattern of a cycle)</td>
<td>60 min individual</td>
<td>1x/week</td>
<td>2-6 hours/cycle (varies according to number of patterns to be addressed)</td>
<td>Cycles are time-based, therefore, each phoneme receives 1-6 hours of intervention/cycle</td>
</tr>
</tbody>
</table>

**HOW LONG?** Hodson and Paden (1991) case studies in text:
(1) Annie – 3 cycles, equivalent to 35 sessions (44 hours) over 15 months
(2) Brad – 2 cycles, equivalent to 30 hours over a 9-month period
### PACT (Parents and Children Together)
(Bowen, 2009; 2010)

<table>
<thead>
<tr>
<th>Dose Form</th>
<th>Dose</th>
<th>Session Duration</th>
<th>Dose Frequency</th>
<th>Total Intervention Duration</th>
<th>Cumulative Intervention Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focused stimulation (drill play)</td>
<td>NR</td>
<td>50 minute individual</td>
<td>Blocks and breaks (10 weeks each)</td>
<td>2-3 blocks of intervention (30-40 weeks) 21 sessions</td>
<td>unknown</td>
</tr>
</tbody>
</table>

**HOW LONG?** Bowen & Cupples (1999) 22 cases involved in non-RCT from referral to dismissal: 21 sessions (equivalent to approximately 17.5 hours) over 10.6 months (range 3 – 19 months)
Core Vocabulary (Dodd, Holm, Crosbie, & McIntosh, 2010)

<table>
<thead>
<tr>
<th>Dose Form</th>
<th>Dose</th>
<th>Session Duration</th>
<th>Dose Frequency</th>
<th>Total Intervention Duration</th>
<th>Cumulative Intervention Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>drill</td>
<td>100-170</td>
<td>30 individual</td>
<td>2x/week</td>
<td>16 sessions (8 weeks)</td>
<td>1600-2720</td>
</tr>
</tbody>
</table>

**HOW LONG?** Only used to address speech inconsistency – up to 8 weeks (16 sessions).
### Stimulability Approach *(Miccio & Williams, 2010)*

<table>
<thead>
<tr>
<th>Dose Form</th>
<th>Dose</th>
<th>Session Duration</th>
<th>Dose Frequency</th>
<th>Total Intervention Duration</th>
<th>Cumulative Intervention Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play-based (drill-play)</td>
<td>50-60 responses</td>
<td>45-50 minutes individual</td>
<td>2x/week</td>
<td>12 sessions</td>
<td>1200-1440</td>
</tr>
</tbody>
</table>

**HOW LONG?** Only used to address limited speech sound stimulability—up to 6 weeks (12 sessions).
Seminar Outline

✓ What is intervention intensity?

✓ What do we know about the intensity of intervention for SSD in children?

→ How might SLPs use the evidence on intervention intensity in their everyday management of SSD in children?
How long does it take in time to treat SSD?

What is my typical session duration and frequency?

Why?

How many trials do I aim for in a session?

What dose forms do I use?

How many sessions does it take to target a particular goal?

What is my typical session duration and frequency? Why?
Barriers and Solutions

- Session frequency
- Total intervention duration
- Session duration
- Trials per session

Limits on...
Barriers and Solutions

Possible solutions

- Re-consider intervention approach
- Enlist the help of child’s significant others
- Re-consider approach to target selection
- Modify dose form to increase dose per session
Future research needs

(1) We need to better understand the **active ingredients** of intervention, that occur during **teaching episodes**, that are provided within **dose forms**.
Future research needs

(2) **Published intervention research** needs to more routinely **report intensity variables** - particularly dose, and describe how it was achieved in a session.

(3) **Experimental research manipulating different components of intervention intensity**, to answer question such as:

- *Is it better to provide 3 x week over 6 weeks OR 1 x week over 24 weeks?*
- *What is an optimal dose per session for a specific intervention approach?*
Too little intervention

Too much intervention
Seminar Outline

✓ What is intervention intensity?

✓ What do we know about the intensity of intervention for SSD in children?

✓ How SLPs might use the evidence on intervention intensity in their everyday management of SSD in children
Intervention intensity for Speech Sound Disorders: How much and for how long?

QUESTIONS AND DISCUSSION

Elise Baker, PhD
The University of Sydney, Australia

A. Lynn Williams, PhD
East Tennessee State University