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

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

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Intervention intensity for Speech Sound Disorders: How much and for how long?

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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)*

- Dose form
- Dose
- Session duration
- Dose frequency
- Total intervention duration
- Cumulative intervention intensity
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
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

Number of studies

Average dose per session

100 production practice trials per session
3. Session duration
4. Dose frequency

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

Number of studies vs. Times per week
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 \textit{(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
(B) Search of (non-peer reviewed) published evidence (e.g., textbooks)

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</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>
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<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>
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<tr>
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<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>
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<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 many trials do I aim for in a session?

What dose forms do I use?

How long does it take in time to treat SSD?

How does the literature on intervention intensity compare to what I do in clinical practice?

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

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

- Session duration
- Total intervention duration
- Trials per session

Limits on...
Barriers and Solutions

Possible solutions

- Re-consider intervention approach
- Enlist the help of child’s significant others
- Modify dose form to increase dose per session
- Re-consider approach to target selection
(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
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QUESTIONS AND DISCUSSION

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