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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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# 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

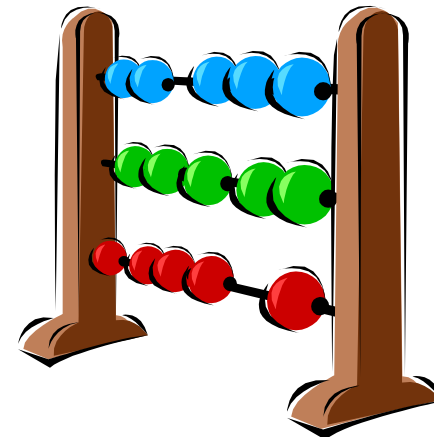
type of task or activity in which teaching episodes are delivered

*(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)

**TUESDAY**

**THURSDAY**



# Intervention intensity

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

## 5. Total intervention duration

Total period of time in which  
intervention is provided

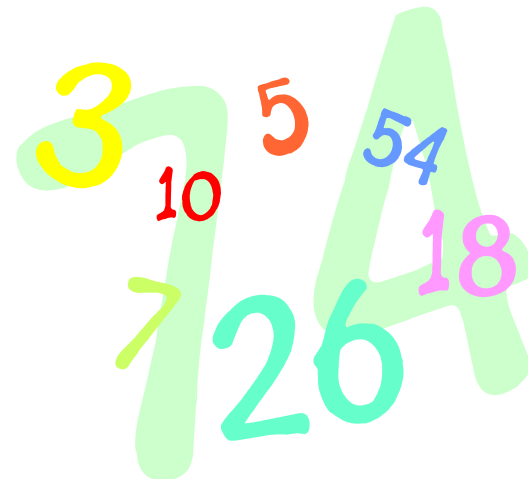
(e.g., 30 weeks)



## 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?



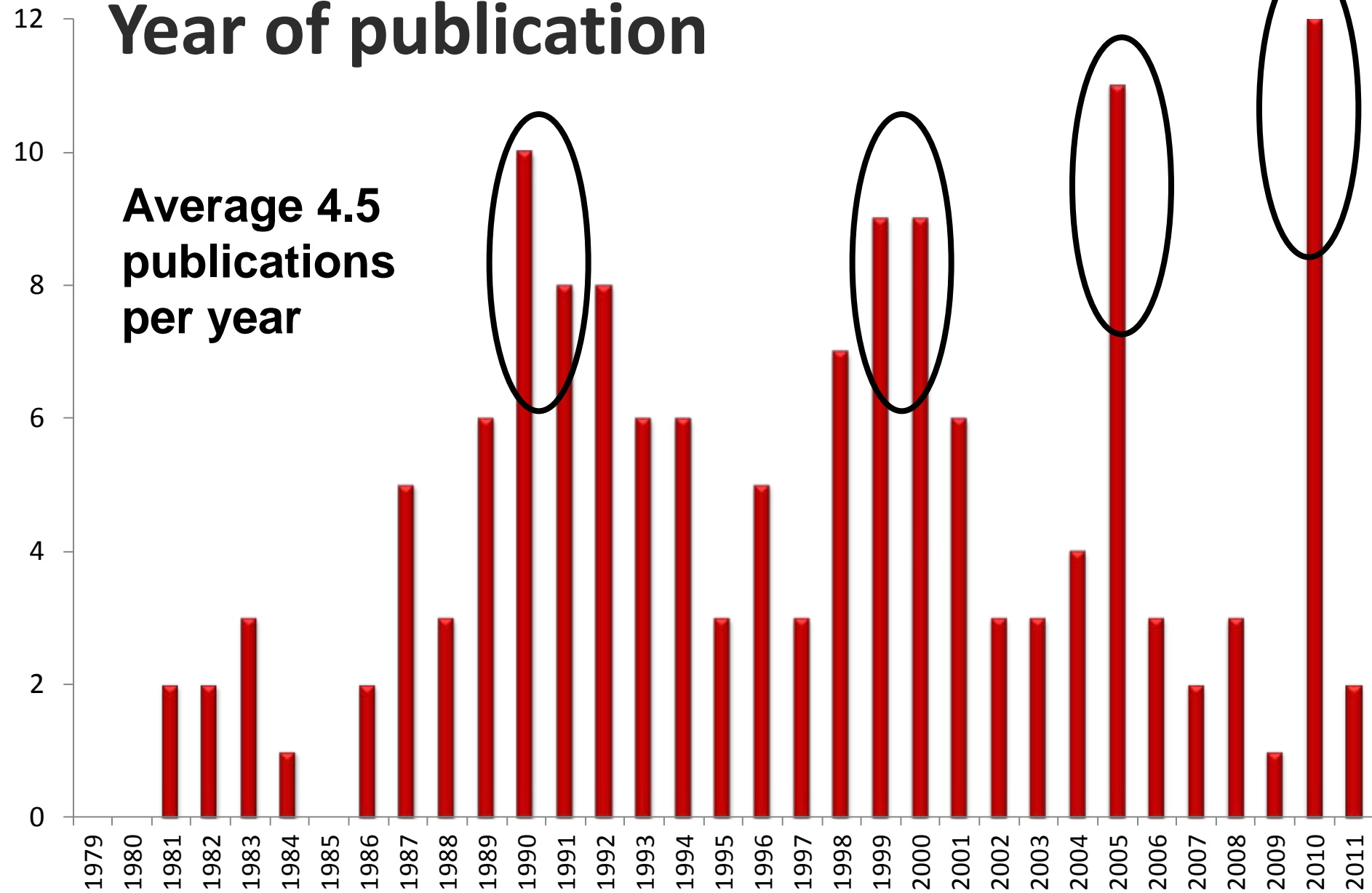
# (A) Search for peer-reviewed published evidence



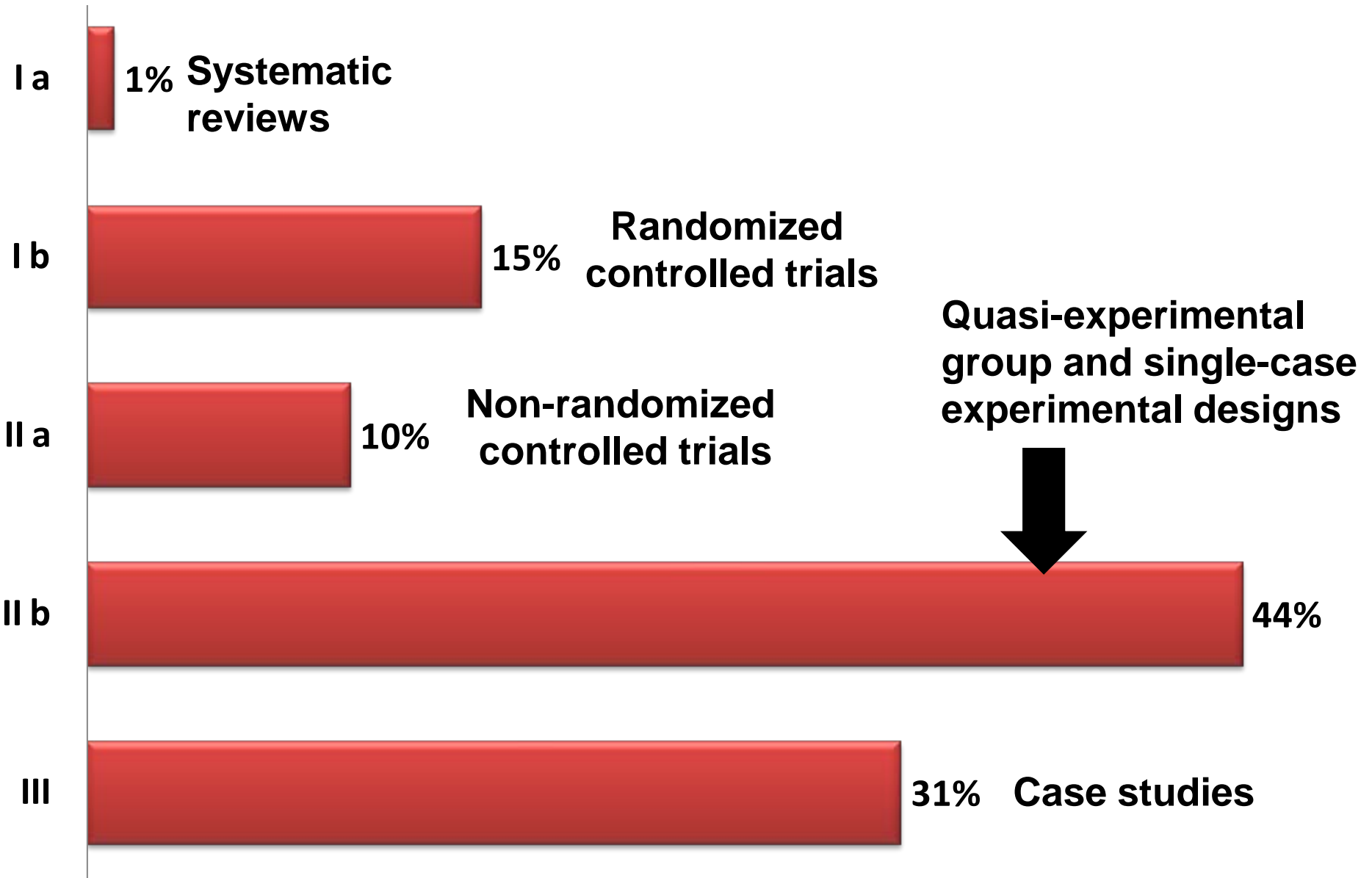
- Peer reviewed published intervention research
  - *Extended Baker & McLeod (2011)'s narrative review 134 studies*
  - *1979 to 2011*
- Search - multiple databases (*e.g., ERIC, Medline, CINAHL, Scopus, SpeechBITE, and ASHA's online journals + hand searches*)
- Search term examples
  - *phonological 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**

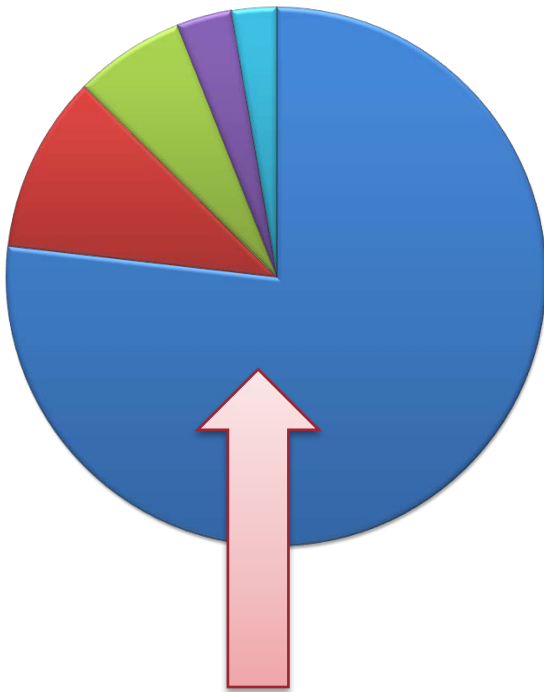


# Levels of evidence (ASHA, 2004)



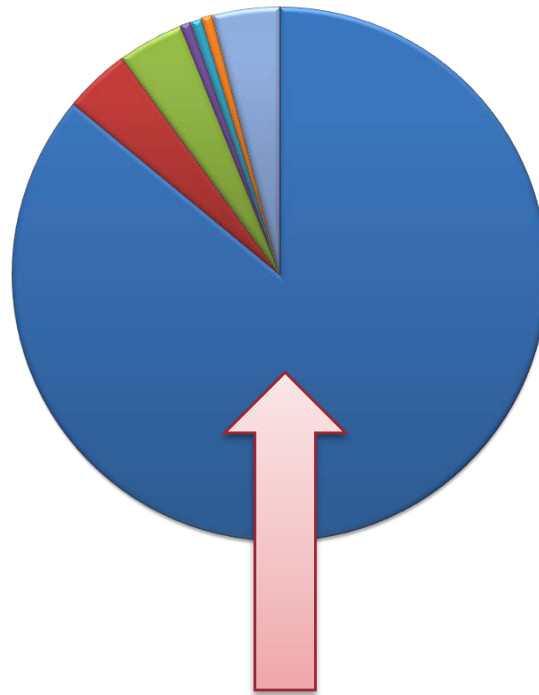
# Service delivery

**FORMAT?**



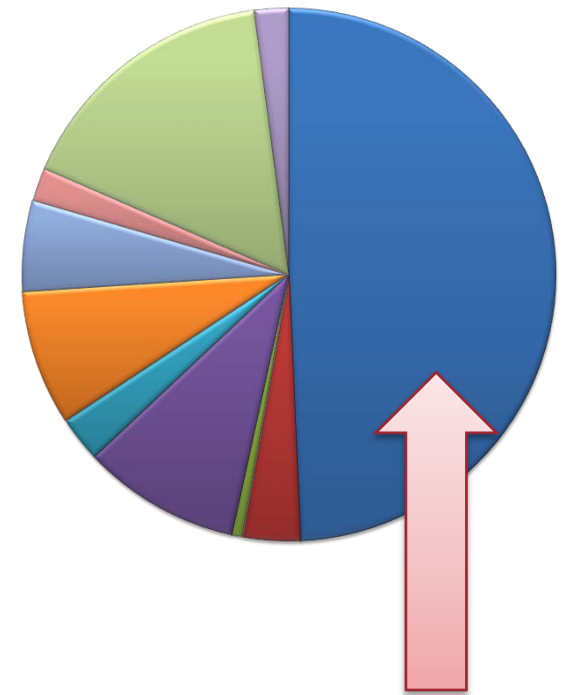
**77%**  
**individual**

**WHO?**



**86%**  
**SLP**

**WHERE?**



**49%**  
**university clinic**

# Intervention intensity across the literature

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

**Dose form**

**Dose**

**Session duration**

**Dose frequency**

**Total  
intervention  
duration**

**Cumulative  
intervention  
intensity**



# 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

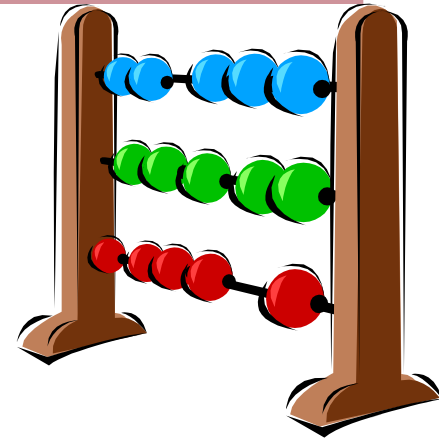
## Clinician inputs

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)*



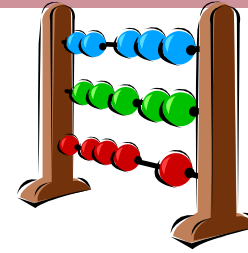
**21% (30/146)** of studies provided quantitative information about dose

**40% (12/30)** were associated with minimal pairs intervention

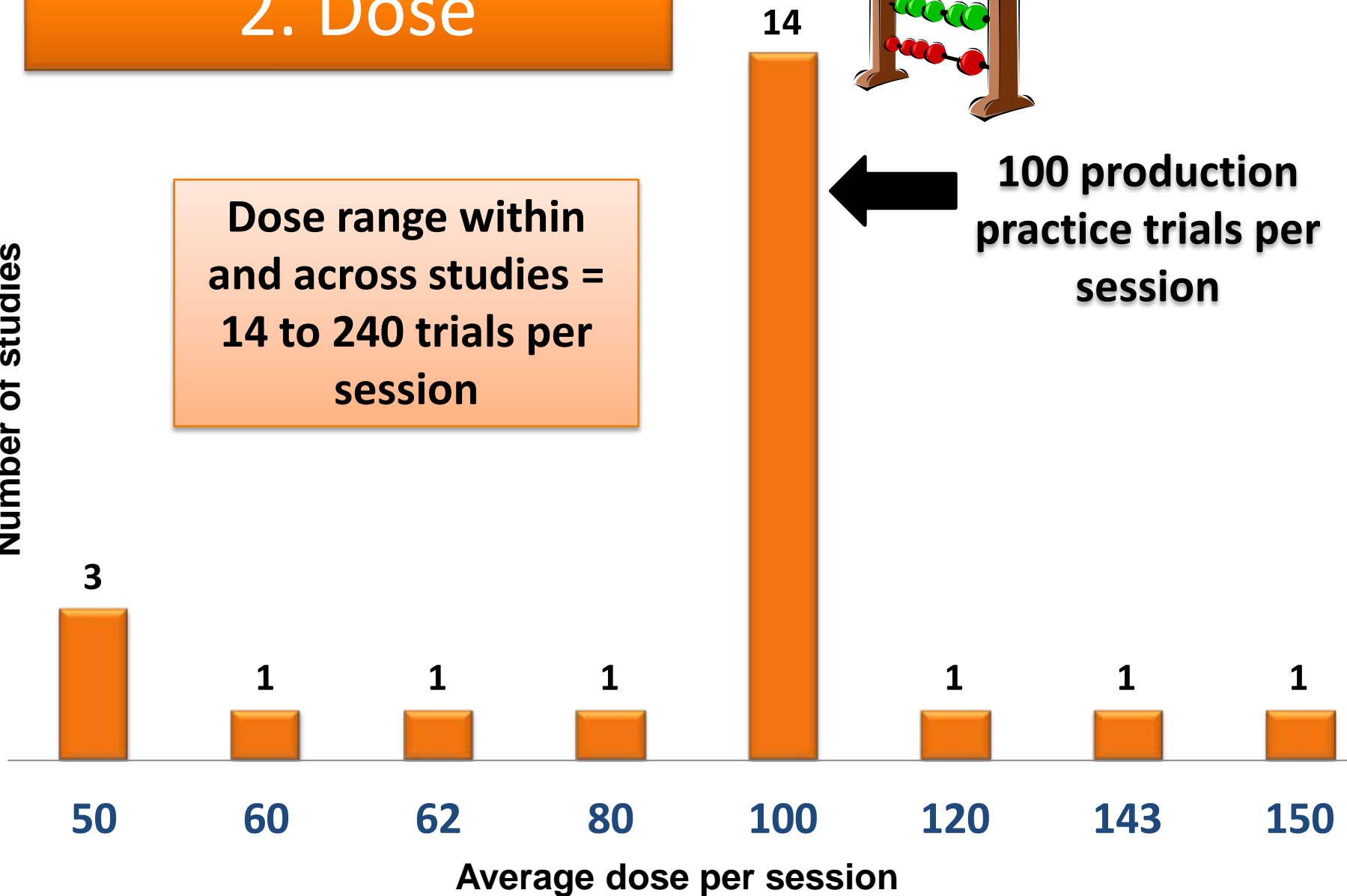
## 2. Dose

Number of studies

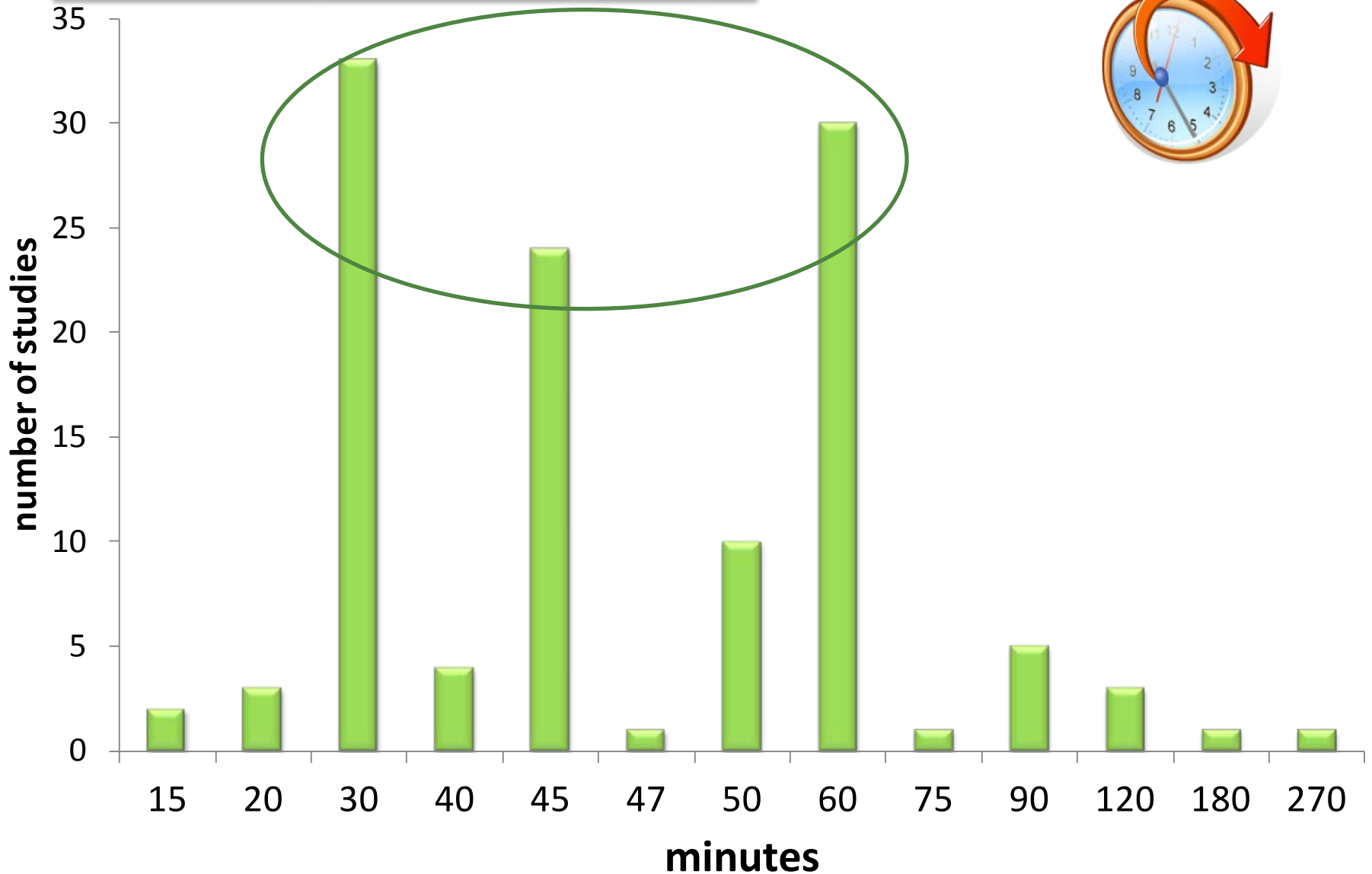
Dose range within  
and across studies =  
14 to 240 trials per  
session



← 100 production  
practice trials per  
session



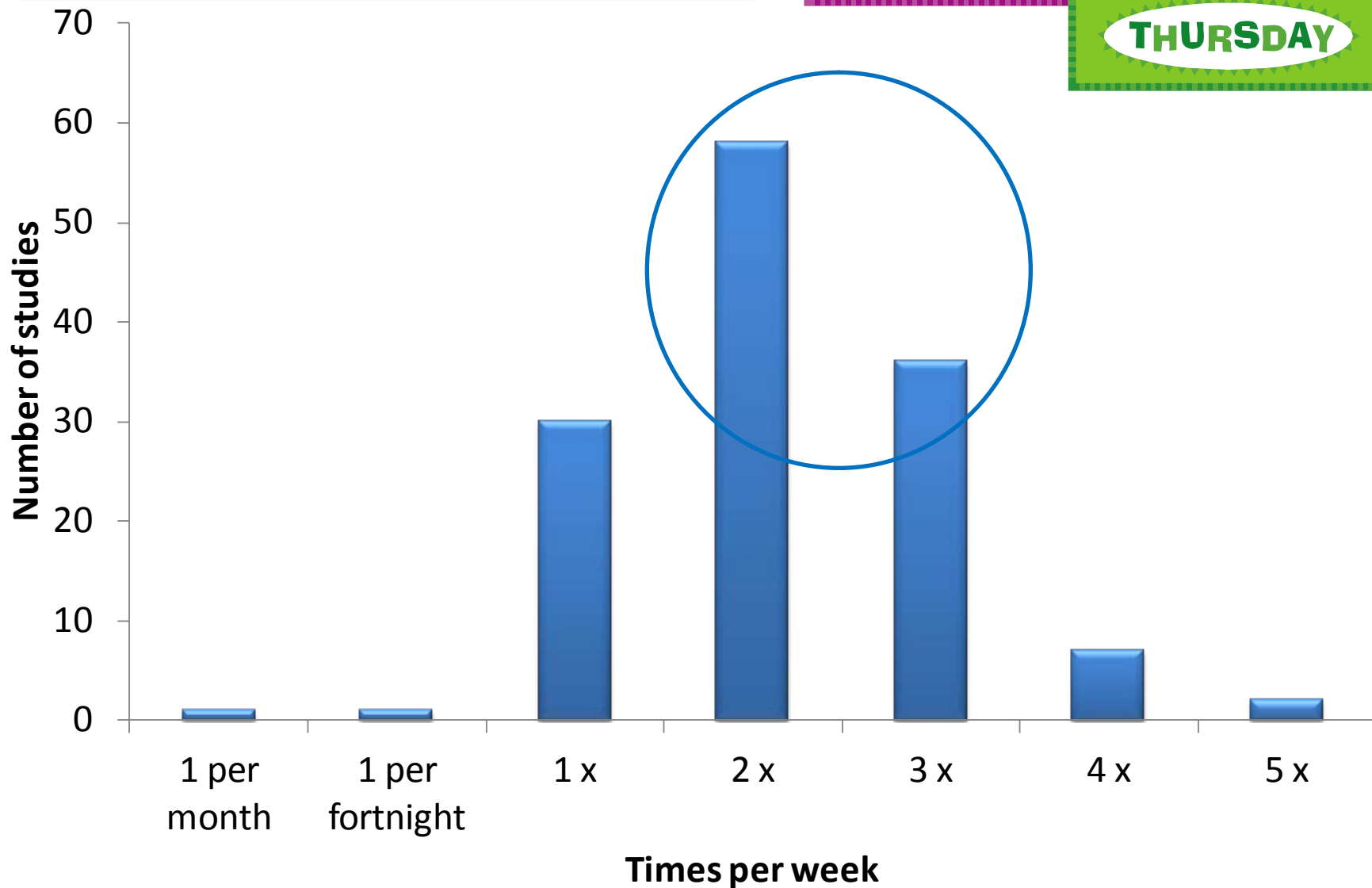
### 3. Session duration



# 4. Dose frequency

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

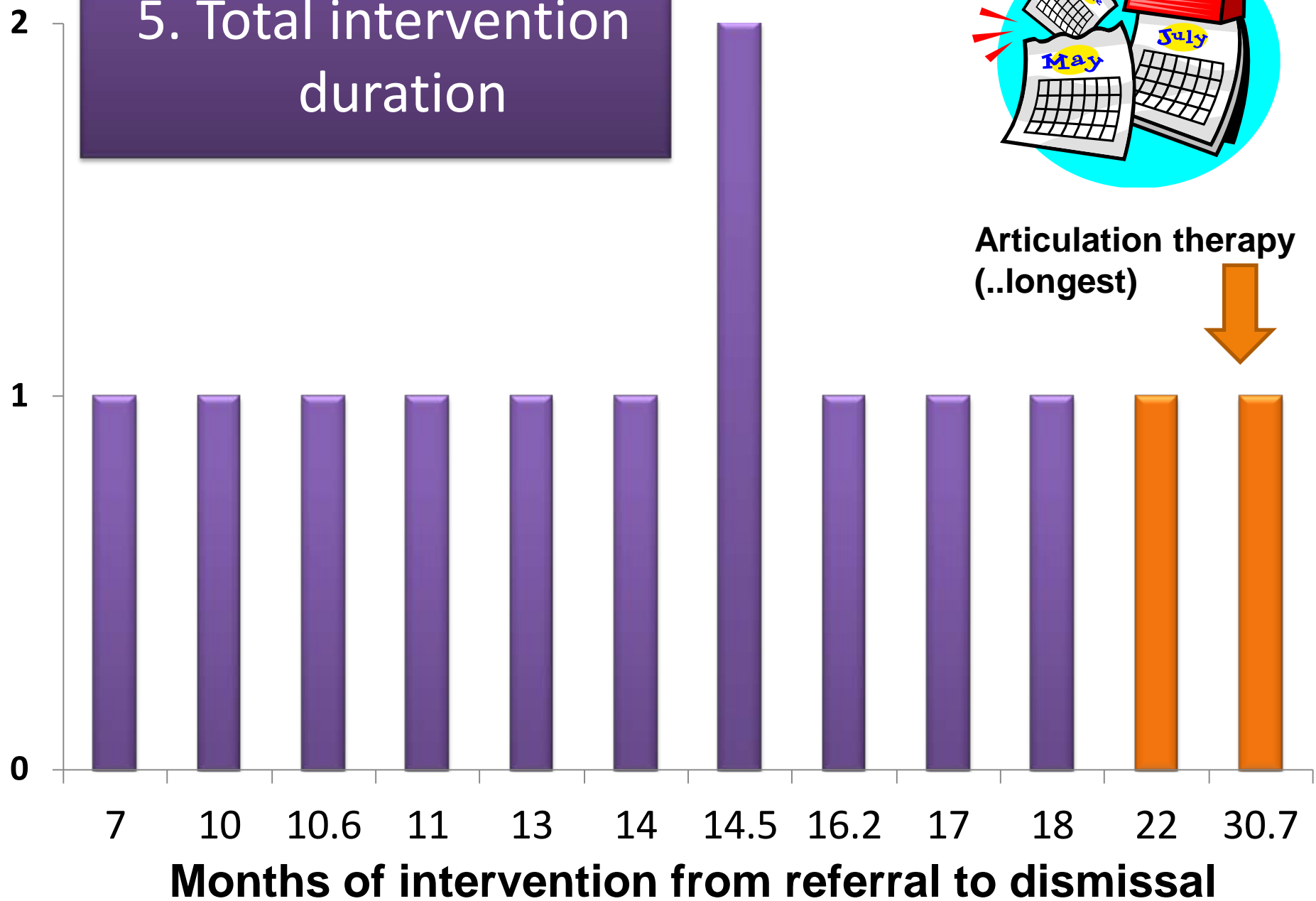
- Mean duration 17.5 weeks (*includes 'restricted' and open durations*)
- Range 1 – 184 weeks.



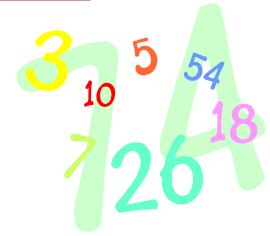
# 5. Total intervention duration



Articulation therapy  
(..longest)



## 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**

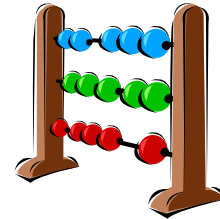
**Total intervention duration:**  
**7 - 18 mths**

**Cumulative intervention intensity ??**

# Limitations of current 'peer reviewed' knowledge base

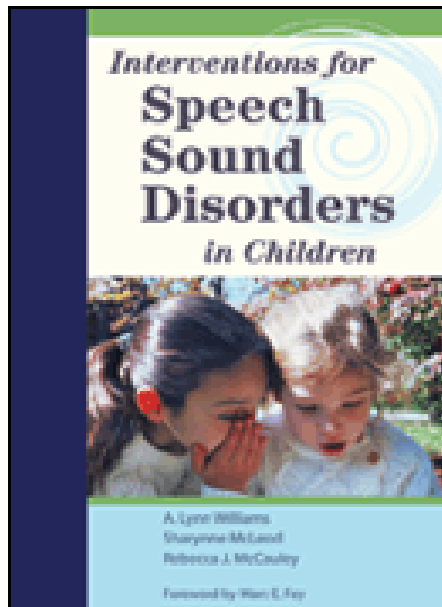
- Gaps in reporting aspects of intervention intensity, particularly:

- 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:

Williams, A. L., McLeod, S. & McCauley, R. J. (Eds.) (2010). *Interventions for speech sound disorders in children*. Baltimore, MD: Paul H. Brookes.

# 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)

Dose Form	Dose	Session Duration	Dose Frequency	Total Intervention Duration	Cumulative Intervention Intensity
Focused stimulation (drill play)	100 trials	30-45 min individual	2x/week	21 sessions (3 months)	2400

## 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)

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

**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)

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

**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)

Dose Form	Dose	Session Duration	Dose Frequency	Total Intervention Duration	Cumulative Intervention Intensity
drill	100-170	30 individual	2x/week	16 sessions (8 weeks)	1600-2720

**HOW LONG?** Only used to address speech inconsistency – up to 8 weeks (16 sessions).

# Stimulability Approach *(Miccio & Williams, 2010)*

Dose Form	Dose	Session Duration	Dose Frequency	Total Intervention Duration	Cumulative Intervention Intensity
Play-based (drill-play)	50-60 responses	45-50 minutes individual	2x/week	12 sessions	1200-1440

**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?**

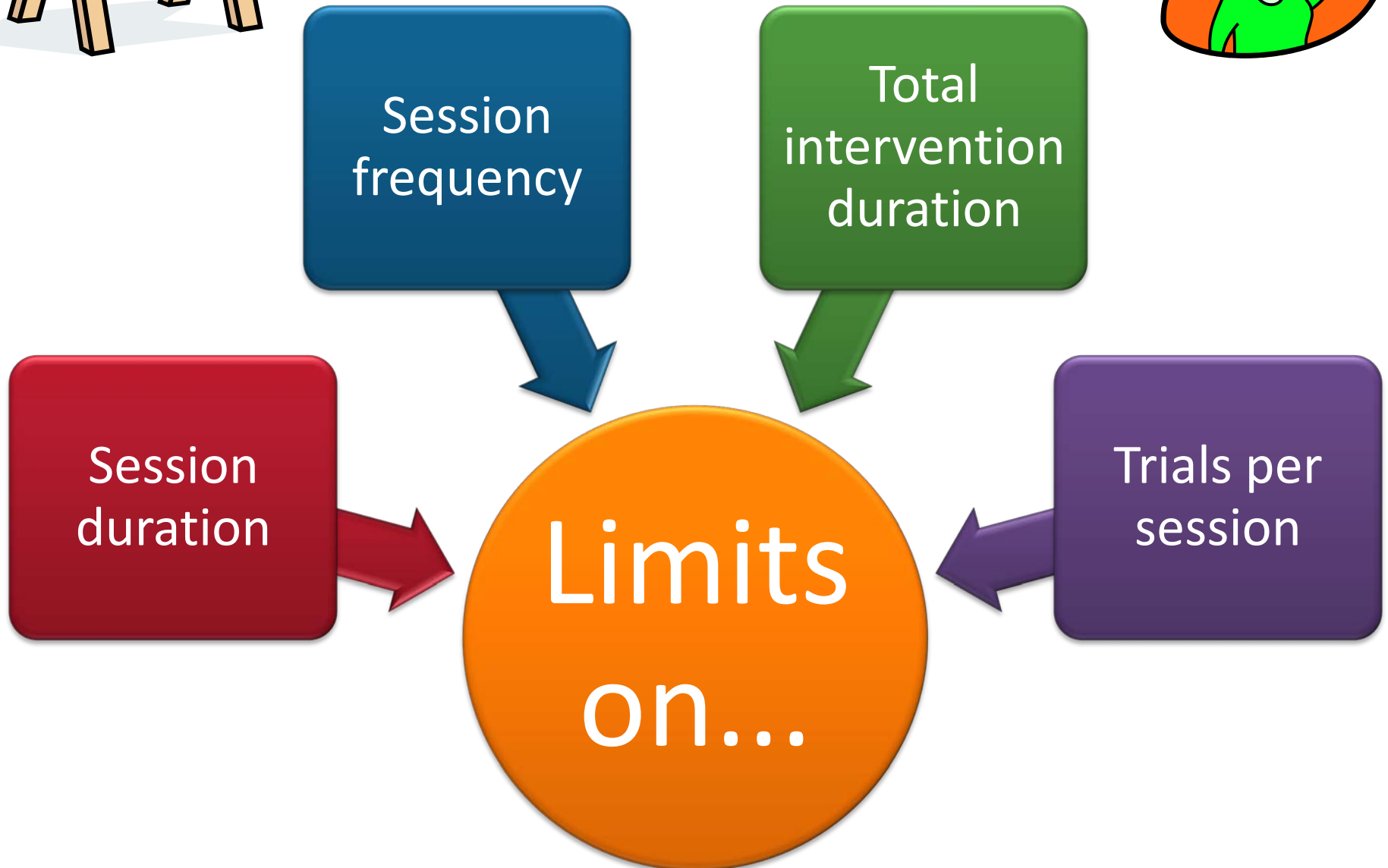
**How long does it take in time to treat SSD?**

**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



# Barriers and Solutions



Re-consider  
intervention  
approach

Enlist the  
help of child's  
significant  
others

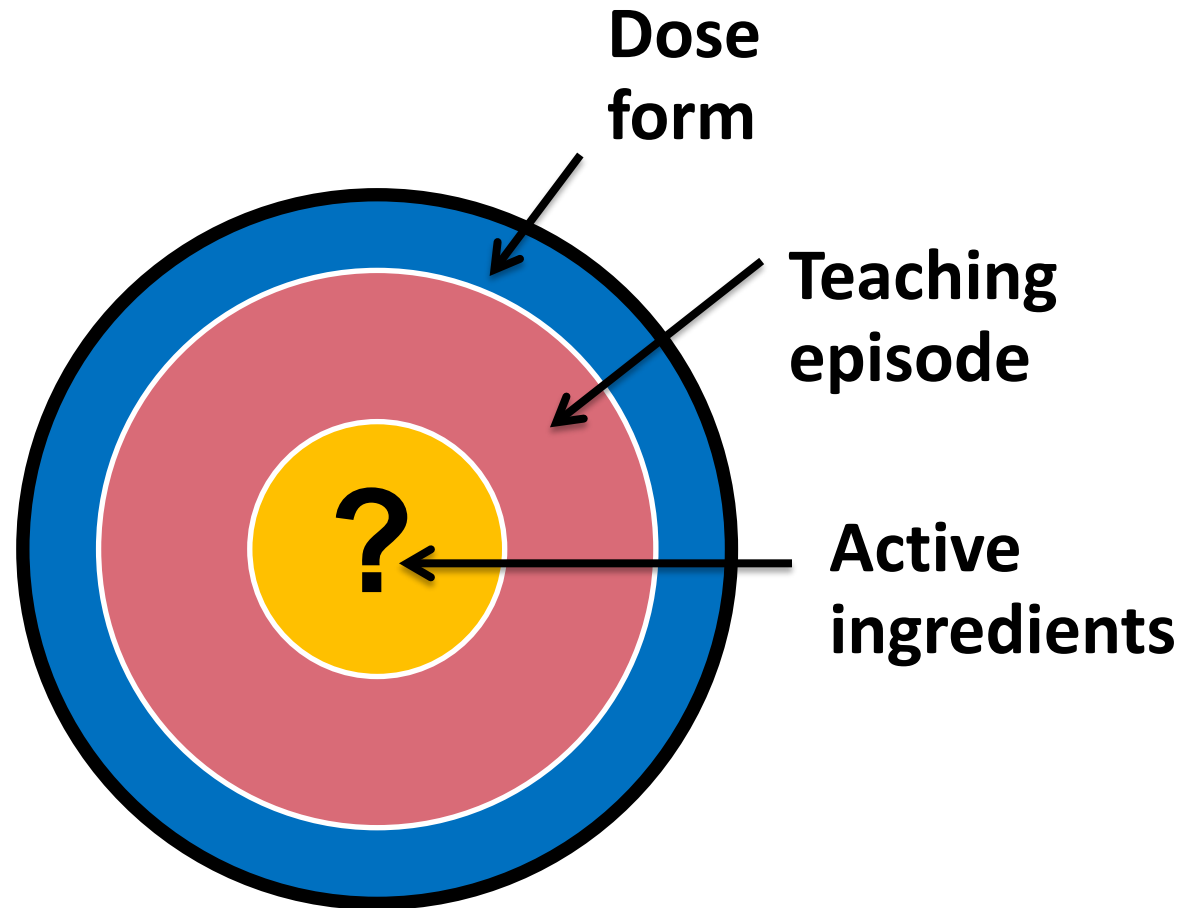
Re-consider  
approach to  
target  
selection

Modify dose  
form to  
increase dose  
per session

*Possible*  
solutions

# 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

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