Interventions for Autism: Translating Research into Practice

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Objectives

• To discuss the importance of good scientific research in the management of children with special needs

• To discuss the autism interventions that have the best scientific evidence

• To discuss challenges in autism research

• To discuss practical tips for parents, therapists, teachers and doctors when using scientific research
Disclosure

I have no conflicts of interest related to the contents of this lecture.
The Scientific Method

1. Ask a Question
2. Research
3. Hypothesis
4. Test with an Experiment
5. Analyze Your Results
6. Hypothesis is True
7. Hypothesis is False
8. Report Your Results

Think about it & Try Again
Varying theories in Autism lead to hypotheses.

Interventions need to be tested systematically.
Why good scientific research is important

• To advance knowledge
• To improve on current conditions
• To avoid harm
• To evaluate effectiveness of what is being done
• To provide basis for recommendations for public funding
Hierarchy of evidence

1. Anecdotes and opinions
2. Animal & cell studies
3. Observational research
4. Randomized controlled trials
5. Meta-analyses
Why testimonials are not enough

Testimonials/case reports

Placebo-controlled trial

INTERVENTION “A”

Testimonials/case reports

WITHOUT INTERVENTION “A”

“placebo effects”

-other factors are causing the improvement
Randomized controlled trials (RCT)

Population is split into 2 groups by random lot

Outcomes for both groups are measured
Meta-analysis

- Systematic review that combines the results of 2 or more RCTs
- Resolves uncertainty when results of single studies are conflicting
The story of Secretin

In 1998: 3 autistic children given Secretin → dramatic improvement in eye contact and language

Randomized, placebo-controlled trials
- 1999 Sandler et al
- 2000 Chez et al
- 2000 Dunn-Geier et al
- 2001 Roberts et al
- 2001 Owley et al

NO EFFECT!

RCT maneuvers that increase validity

Population is split into 2 groups by random lot

Outcomes for both groups are measured

CONTROL

INTERVENTION
Randomization

Ensures that the groups being compared are EQUAL in most aspects
- Severity
- Age
- Family support, etc.
Placebo control

Participants & their families in both groups should believe they are receiving an intervention.
Blinding

Outcome assessors should NOT know which intervention the participant has received.
Balance of benefits and harms

- Benefits should outweigh the harms
- Requirements for establishing benefits are stricter compared to establishing harms
Strength of evidence classification

- **Established**
  - EFFECTIVE
  - INEFFECTIVE
  - high-quality studies show benefits
  - high-quality studies show no benefit

- **Emerging**
  - need for high-quality studies to confirm

- **Unestablished**
  - conflicting results; no RCTs
ESTABLISHED Interventions

High-quality studies have provided evidence
- **EFFECTIVE**: Meta-analysis of RCTs with blinding, RCT + high-quality cohort studies
- **INEFFECTIVE/HARMFUL**: at least one RCT
Early intensive behavioral intervention

increases social communication, decreases problem behaviors, improves academic skills and motor skills

- Intensive at 25-40 hours per week for 2-3 years
- Targets the defining symptoms of ASD
- Based on Applied Behavior Analysis (ABA) principles
- Individualized instruction in various settings (home, school, community) and small group instruction
- Functional behavior assessments are often needed even in older children to target specific problems
Parent-mediated social-communication intervention

improves social interaction, communication acts, joint attention and joint engagement

- Play-based
- Adjusted to the child’s developmental level
- Speech therapists teach parents/caregivers techniques such as joint action routines, following the child’s lead, using play to elicit and reward communication
- Therapist modelling and video-interaction feedback
Naturalistic teaching strategies improve joint attention and social communication

- A.k.a. incidental teaching, milieu teaching, embedded teaching, responsive education, focused stimulation
- Observing the child’s interests and structuring teaching sessions around them
- Use of materials that the child encounters daily
- Includes strategies such as modelling and physical prompting
Peer-mediated social-communication intervention

improves child-initiated social interactions and peer-child joint engagement

• For school-age children (average age: 8-9 years old)
• Typically-developing peers are taught techniques such as social modelling and reinforcement, how to deal with aggressive behavior and how to engage a child with autism
• Orientation, role-playing, free-play sessions
Social skills group intervention

improves social behaviors

• Use of instruction, modelling, rehearsal and performance feedback in a group
• Target skills included playing cooperatively, taking turns, listening, reciprocal conversation, team-working
• Parents also trained to organize play dates to increase generalization
Anti-psychotic medication (Risperidone, Aripiprazole)

*lessens aggressive and self-injurious behaviors*

- Not effective for addressing core Autism features
- Considered only when psychosocial interventions are insufficient
- Functional assessment of behavior should be done
- Interventions also given for co-existing contributory factors (communication impairments, pain, environmental conditions)
- Use lowest effective dose, re-evaluate effects after 3-4 weeks, stop after 6 weeks if no response
Parent training improves social skills in children with Asperger

• Education of parents regarding the disorder, expected behavior problems and reason for these behaviors
• Use of social stories and comic strip conversations to teach social skills
Cognitive-behavioral techniques

reduce anxiety, hyperactivity and conduct problems; improve anger management

• Used for older children (mean age 10 years)
• Techniques included recognizing anxiety symptoms, using coping skills and relaxation techniques
• Usual CBT adapted for ASD by using more visual aids, providing lists of alternative responses and devoting more time to concrete exercises
INEFFECTIVE Interventions (placebo effects)

• Anti-depressants (Fluoxetine, Citalopram) - stereotypy, hyperactivity, decreased attention
• Anti-convulsants (Divalproex sodium)
• Secretin - diarrhea, vomiting, irritability
• Chelation - hypocalcemia, renal impairment
• Neurofeedback - worsening semantics
• Auditory integration training

Hyperbaric oxygen therapy - ear barotrauma
EMERGING Interventions

At least one study shows favorable outcomes but more high-quality studies are needed.
EMERGING (Promising) Interventions

• Combined teacher and parent interventions (e.g., LEAP) for overall autistic behaviors, language skills, academic skills and motor skills

• PECS for social communication and language

• Computer-based emotional recognition therapy for emotional and facial recognition (proximal measures of social communication)
EMERGING (Promising) Interventions

• Multi-vitamins for overall autistic behaviors and receptive language
• Music therapy for expressive language
• Sensory integration therapy for sensory problems
• Melatonin + CBT for sleep problems
UESTABLISHED Interventions

Studies show no significant benefit or show conflicting results; future studies may prove it to be effective or ineffective.
UNESTABLISHED Interventions with RCTs

• DIR/ Floortime
• Theory of Mind
• Gluten-free, casein-free diet
• Acupuncture/ acupressure
• Qigong massage
UNESTABLISHED Interventions with RCTs

- Horseback riding
- Kata (Shotokan) techniques
- Omega-3/DHA supplement
- L-carnosine supplement
- Atomoxetine for ADHD symptoms in ASD
Challenges in Autism Research

- Heterogeneity of children with ASD and confounding factors
  - Importance of randomization
- Blinding
  - Importance of choosing outcome measures (not self-rated or parent-rated)
- Heterogeneity in interventions and outcomes
  - Importance of structuring and defining the intervention and the target outcome
Challenges in Autism Research

• Small sample sizes
  • Importance of doing what others have been doing (instead of formulating a new program), and publishing, to combine results

• Lack of researchers
  • Importance of doing research for Filipinos by Filipinos
  • Research provides opportunities for novel interventions to be given for free while still unestablished
Practical tips

• Start with established interventions
  • Consider values and preferences of the family and individual
  • Consider availability and access to services
  • Consider capacity of service providers to correctly implement the intervention
• Use emerging interventions if established interventions are not working or not available
• Explore unestablished interventions only in addition to established
  • Consider safety
  • Consider cost/allocation of family resources
Where to get good information

- Government websites, professional society websites
- Avoid websites that are selling products or interventions
- Discuss options with your doctor
In the Philippines

• Need to increase parent/caregiver training interventions
• Need to increase peer-mediated interventions in schools
• Need to strengthen publicly-funded early detection and intervention
• Explore Filipino strengths (extended families)
Take-home messages

• Be open-minded but skeptical.

• A lack of evidence doesn’t always mean it isn’t effective, but it makes it harder to evaluate effectiveness and safety.

• Prioritize doing established interventions first.
Thank you!
Main References
