PATIENT SAFETY IN SPEECH-LANGUAGE PATHOLOGY AND AUDIOLOGY: REDUCING MEDICAL ERRORS IN SERVICE DELIVERY
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Disclosure
• Dr. Robinson has Financial disclosure for this presentation.
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Learning Objectives
Participants will be able to:
• Define patient safety as it relates to clinical practice
• Describe the stakeholders’ perspective in patient safety
• Understand the role of speech-language pathologists and audiologists in patient safety

Introduction
• A relatively new area in health
• There is a national push
• In every hospital this issue is addressed

Introduction (Chandrasekhar, 2019)
• 14th leading worldwide cause of morbidity and mortality
• Of these events 83% could have been prevented
• 15% Healthcare spending could be saved
What is Patient Safety?

- A discipline that emphasizes the preventing, reducing, reporting and analysis of medical error that often leads to adverse healthcare event.
  - Sentinel Event
  - Patient Safety Culture

Patient Safety

- The Institute of Medicine (IOM) considers patient safety “indistinguishable from the delivery of quality health care.”
  - “Quality is an optimal balance between possibilities realized and a framework of norms and values.”
  - The cornerstone of high-quality health care

Origins of Patient safety problems

- Type (error)
- Communication failures between patients and/or practitioners
- Patient management (improper delegation, wrong use of resources)
- Clinical performance (before, during and after treatment)

Quality

The IOM defines 5Ds as quality indicators:

- Death
- Disease
- Disability
- Discomfort
- Dissatisfaction

Rather than stating more positive components of quality.

Brief History

- Hippocrates recognized the potential for injuries
- 1982 US The Deep Sleep
- 1983 British Royal Society of Medicine and Harvard co-sponsored event to focus on this
- 1984 American Society of Anesthesiologists formed Anesthesia Patient Safety Foundation began using the term “Patient Safety”

Brief History Continues

- 1988 Australian Patient Safety Foundation was founded
- While only 5% of physicians in US, became leaders in this area and expanded to other medical errors
- 1999 the Institute of Medicine released To Err is Human: Building a Safer Health System.
- This raised national and international concerns
Stakeholders

- Patients
- Audiologists
- Speech-Language Pathologists
- Institutions
- External Accreditors

Diagnosis is Difficult

Patient Information

Access

Clinician Reasoning Abilities

Stress Factors

Silos

Patient Access

Data Systems

Institutional Variables

- Cultural
- Educational

- Organizational

- External

- Tech.

Diagnostic Errors

- In 2015 Institute of Medicine published a report titled: “Improving Diagnosis in Health Care”
  - Diagnostic errors account for 6-17% of hospital adverse events and roughly 10% of patient deaths.
  - Continuation of Institute of Medicine reports “To Err is Human: Building a Safer Health System” (2000) and “Crossing the Quality Chasm: A New Health System for the 21st Century” (2001)

Patient Safety: Prevention of Harm to Patients

- Prevents errors
- Learns from the errors that do occur
- Built on a culture of safety that involves
  - health care professionals
  - organizations
  - patients

2017 National Patient Safety Goals

Identified by Joint Commission

- Identify Patients Correctly
- Improve Staff Communication
- Use Medicines Safely
- Use Alarms Safely
- Prevent Infection
- Identify Patient Safety Risks
- Prevent mistakes in surgery

Systems Errors

Institutional
- Culture
- Education and training

Electronic
- Inadequate EHR
- Inadequate equipment
- Failure to Use equipment adequately

Local
- Communication Breakdowns
- Processes
- Policies and Procedures out of date
Human Factors

Patient Safety Issues in Speech-Language Pathology

Safety Issues in Speech-Language Pathology

• Examples
  – Seeing a patient (especially children) for SLP Evaluation or Treatment without a Hearing Screening as a part of the protocol
  – Calculating date of birth incorrectly
  – Interpreting data incorrectly
  – Recommending incorrect treatment for dysphagia

Safety Issues in Speech-Language Pathology

• Examples
Assessing the child in English only and not considering their first language
Clinician professes to be competent in another language but has limited proficiency
Child with ASD needs are determined by the ABA therapist only and excludes SLPs

Safety Issues in Speech-Language Pathology

• Examples
Children misdiagnosed as ASD versus language disorder
Child with fluency disorder is obedient submits written work and doesn’t exhibit needs that interfere with their performance in the classroom

Case Study

• 75 year old male was evaluated in the hospital and diagnosed with dysphagia.
• Pt is discharged to SNF with treatment strategies and instructions.
• SLP at receiving SNF reads the report and misinterprets the abbreviations and symbols. This results in patient being fed with textures and swallowing strategies that don’t facilitate safe swallowing.
• Patient get aspiration pneumonia and is readmitted to acute care hospital.

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Take Away

• Abbreviations and symbols cannot stand alone in the medical record and when used must be explained.
• The need for communication with the patient and family members is important for transitions.
• Readmissions due to medication errors can be reduced by making sure the health care providers and patients are familiar with dosages and reasons for medications.

Take Away

• Consider the impact of clinicians actions on all patients.
• Consider the cultures of the patient related to touching who makes the decisions in the family, foods excluded from diets, etc.
• Facilities need to review all errors and consciously decide where changes in practices or procedures are warranted.

Patient Safety Issues in Audiology

Cross Check Principle

• Recently reviewed in *Journal of Audiology and Otology* in September 2016 by Dr. James W Hall III from 40 year perspective.
• Concept created and published in 1976 by Dr. James Jerger and Dr. Deborah Hayes — Published in *Journal Otolaryngology*.

Cross Check Principle

• Original Definition: “the results of a single test are cross-checked by an independent test measure”. 
• Per Dr. Hall ‘’...no auditory test result should be accepted and used in the diagnosis of hearing loss until it is confirmed or crosschecked by one or more independent measures. Exclusive reliance on only one or two tests, even objective auditory measures, may result in a auditory diagnosis that is not clear or perhaps incorrect”. 

Basic Test Battery

- Aural Immittance Measure
- Tympanometry (226 vs 1000 Hz)
- Acoustic Reflexes (threshold vs. screening)
- Otoacoustic Emissions (OAEs)
  - DP vs TEOAEs
- Auditory Brainstem Response (ABR)
  - Click stimulus (air & bone)
  - Tone burst (chirp) stimulation
The Complex Care Patient

Patient #1

- Initial evaluation at 2 years of age after failed newborn hearing screening
- Born at 34 weeks with extended NICU stay
- Deletion on chromosome 2q37.1 of 3.5 megabases within the cytogenetic band of 2q37.1, consistent with a chromosome 2q37 deletion syndrome
- Medical diagnosis significant for: hypertension, reactive airway disease, subglottic stenosis, hydrocephalus, G-tube feeds, global developmental delays, autism, Chiari I malformation, visual deficits

Patient Initial ABR results:

EVOKED RESPONSE CONSULTATION REPORT:

BRAINSTEM AUDITORY EVOKED RESPONSE RESULTS:

LEFT CLICK THRESHOLD: V wave was elicited up to 50 dB.
LEFT 4 KHZ TONE THRESHOLD: V wave was elicited up to 60 dB.
LEFT 1 KHZ TONE THRESHOLD: V wave was elicited up to 50 dB.
LEFT 500 HZ TONE THRESHOLD: V wave was elicited up to 70 dB.
LEFT BONE CONDUCTION: Not done

RIGHT CLICK THRESHOLD: V wave was elicited at 60 dB.
RIGHT 4 KHZ TONE THRESHOLD: V wave was elicited at 60 dB.
RIGHT 1 KHZ TONE THRESHOLD: V wave was elicited up to 60 dB.
RIGHT 500 HZ TONE THRESHOLD: V wave was elicited up to 70 dB.
RIGHT BONE CONDUCTION: Not done

IMPRESSION: This is an abnormal brainstem auditory evoked response indicative of bilateral hearing loss. Bone conduction was not performed. ENT and Audiology evaluation is recommended.

Patient #1

- Hearing Aids fit based off ABR results
  - No middle ear assessment or bone conduction
- Testing continues to show middle ear dysfunction for the next 2 years
- In 2016 testing suggested hearing loss is conductive in nature
  - 4 years after initial evaluation
- Followed by ENT for airway issues since 18 months of age. PE tube placed at age 7 years.
Auditory Brainstem Response (ABR) is a test of auditory nerve and brainstem function in response to acoustic stimuli and is used to assess hearing sensitivity. ABR testing was performed with a single channel high forehead to mastoid electrode montage following ENT physician’s procedure of bilateral myringotomy tube insertion and while the patient was still under sedation. Pediatric insert earphones and bone conduction oscillator were used as transducers.

**AIR CONDUCTION:**
- **RIGHT EAR:**
  - Clicks (2000-4000 Hz): was measured down to 20 dBnHL
  - 500 Hz: was measured down to 40 dBnHl, which can be corrected to 20 dBeHL
  - 4000 Hz: was measured down to 30 dBnHL, which can be corrected to 25 dBeHL
- **LEFT EAR:**
  - Clicks (2000-4000 Hz): was measured down to 20 dBnHL
  - 500 Hz: was measured down to 40 dBnHl, which can be corrected to 20 dBeHL
  - 4000 Hz: was measured down to 30 dBnHL, which can be corrected to 25 dBeHL

**IMPRESSIONS:**
Today’s evaluation results revealed normal conduction through the auditory pathways to the level of the brainstem in response to a low level stimulus is consistent with normal hearing sensitivity for each ear individually. Conduction times, amplitudes and waveform morphology were within normal limits in all conditions. Patient’s thresholds have significantly improved bilaterally compared to her previous ABR evaluation in 2013 at all the tested frequencies. Results were explained to Kathy’s mother and she was advised to discontinue use of the hearing aids. Due to concerns for acquired hearing loss associated with medical history and patient’s inability to reliably report perceived changes in hearing sensitivity, patient’s hearing should be regularly evaluated.

ABR is a test of cochlear/auditory nerve function and is not a test of hearing. Behavioral audiometric testing should be attempted to fully assess the entire auditory system including cognition of sound, and to support today’s findings.

**Take Away**
- Full battery was not employed
  - Hearing aids fit based on incomplete results
- Empower parents
- Utilize team approach to patient care
- Consider bone conduction hearing aids to avoid risk of over amplification
- Frequent monitoring with DME devices

**Patient #2**
- Birth history significant for: ex 24 weeker, ELBW, microcephaly, severe spastic quadraparetic cerebral palsy and complex partial epilepsy. No seizures.
- Medical History significant for: acute respiratory failure, chronic lung disease of prematurity, complex partial epilepsy, delayed puberty, gastrostomy, generalized intestinal dysmotility, neuromuscular scoliosis, osteopenia, encephalopathy, pneumatosis intestinalis, respiratory failure, spastic cerebral palsy, tracheostomy tube, cortical visual impairment, chronic middle ear dysfunction (PE tubes x5)
- He has lived at Second Family for his whole life

**Patient #2**
- ABR was requested with PE tube placement
  - EEG completed ABR evaluation
- **Standard Setting Employed**
  - Recommended Test Settings: • Stimulus: click and toneburst • Duration: 0.1 milliseconds • Rate: 27.7 per second • Polarity: rarefraction and condensation, and alternating. • Transducers: insert earphones • Filters: 100 - 3000 Hz for adults • Notch Filter: OFF • Amplification (gain): 100K • Analysis Time window: 0 - 12 milliseconds • Sweeps: 1024 • Electrode Placement: ipsilateral array.
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- Standard Setting Employed
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    - Sweeps: 1024
- Electrode Placement: ipsilateral array.

Patient #2

- Issues:
  - Severe neurological involvement – ABR is not best measure.
  - No OAEs completed with clear ears
  - Previous behavioral testing indicated startle at 70 dBHL with responses at 50 dBHL AND middle ear dysfunction
  - Fit with hearing aid amplification based on ABR

Patient #2

- Aid report:
  - Patient does not show benefit with amplification
  - She did not feel he liked wearing them
- Hearing aid check
  - Patient started to cry when hearing aid initially put in place

Take Away

- Full Battery not employed
- Neurologically involved patients should never be diagnosed with ABR testing in isolation
  - Likely to take several behavioral attempts to obtain reliable results
- Monitoring patient’s reaction is invaluable
  - Auditory Questionnaires

Take Home Topics/Summary

- Communication
- Patient Safety Education
- Technology
- Electronic Health Records
- Health Literacy
- Evidence Based Practice
- Quality Improvement and Safety Initiatives
- Safety Culture

Questions and Answers

References

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