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COMMUNITY MOBILITY FOR PEDIATRIC OCCUPATIONAL THERAPISTS PRACTITIONERS

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OBJECTIVES

At the end of the course, attendees will be able to:

• Identify the developmental stages of child passenger safety and principles of installation and use of child safety seats.

• Identify community-based approaches to supporting safe bicycle and pedestrian safety.

• Recognize concerns related to transition to driving for pre-driving teens with development and learning needs.
DRIVING AND COMMUNITY MOBILITY

- Classified as an IADL
- Driving and Community Mobility
- “Planning and moving around in the community and using public or private transportation, such as driving, walking, bicycling, or accessing and riding in buses, taxi cabs, or other transportation systems” (AOTA, 2014, p. S19)

- Occupation Enabler
- Facilitates participation in other occupations (AOTA, 2016; Stav & Lieberman, 2008)

VALUE OF COMMUNITY MOBILITY

- Transportation from point A to point B
- Access to other types of engagement
- Represents milestones:

  Ride home from hospital as a baby
  Trip out with grandparents
  First steps… down the side walk
  Independent bike riding
  Riding the schools bus
  Independent street crossing
  Walking to a friend’s house
  Riding a skateboard
  Independent outing
  Riding a public bus
  Out with friends who drive
  Passing the driver license test
IMPLICATIONS OF DISRUPTED COMMUNITY MOBILITY

- Interruption in meaningful occupational engagement:
  - IADL
  - Leisure and play
  - Social participation
  - Education

- Negative effects to health and quality of life
  - Access to medical care
  - Grocery shopping
  - Nutrition
  - Depressive symptoms
  - Limitations in transportation alternatives
    - Destinations
    - Schedules
    - Municipal lines

WHY SHOULD BE PAY ATTENTION?

- All of our clients need to be mobile in the community for travel to:
  - School
  - Friends
  - Healthcare
  - Throughout neighborhood
MODES OF COMMUNITY MOBILITY FOR CHILDREN - ADOLESCENTS

- Child passengers
- Pedestrians
- Bicyclists
- Drivers
- Bus users
- Airplane passengers

CHILD PASSENGERS
WHY IS OT CONCERNED WITH CPS?

- Our clients include:
  - Children
    - Are clients coming/go ing safely?
  - Clients who have children
    - Can our disabled parents secure their kids?
  - Clients who transport children
    - Grandparents who parent
    - People who drive professionally
  - Companies who serve children
    - Schools, daycare centers, transit companies, state agencies

CPS IMPACTS ON OCCUPATION

- How does sitting in a child safety seat impact the child?
  - Positioning
  - Behavior
  - Social interaction
  - Sensory
  - How does the child safety seat impact the adult?
    - Logistics
    - Driving
WHAT WE SHOULD KNOW

- Different types of seats
  - Infant Seats
  - Forward facing car seats
  - Booster seats
  - Seat belts
- Child passenger safety laws
- Securing disabled children
- Disabled parents securing children
- School bus safety

DIFFERENT TYPE OF SEATS

- Seating needs change based on development
- Guidelines are by age and weight
- Crash dynamics are taken into consideration
- Best fit between car/seat/child is necessary
CAR SEAT RECOMMENDATIONS

4 STEPS OF CHILD PASSENGER SAFETY

- Step 1 - Rear facing infant seat
  - Until age 2 in the rear seat
  - Fastened to the butt of the seat
  - Never near an airbag
  - Harness guidelines
  - Clip guidelines
4 STEPS OF CHILD PASSENGER SAFETY

- Step 2 – Forward facing car seat
  - Over age 2
  - Until 4'9" and 80-100 lbs
  - Fastened with seat belt or LATCH system
  - Never near an airbag
  - Harness guidelines
  - Clip guidelines

4 STEPS OF CHILD PASSENGER SAFETY

- Step 3 – Boosters
  - Use with vehicle lap and shoulder safety belts
  - Use when forward seat is outgrown until
    - 80 – 100 lbs.
    - Is 4’ 9”
  - Pass the Safety Belt Fit Test
  - Typically 8 – 12 years
  - Allows safety belt designed for an adult to fit a child
4 STEPS OF CHILD PASSENGER SAFETY

- Step 4 - Transition to a vehicle seat with a seat belt
- Must be:
  - 4’9” and 80-100 pounds
  - Pass the fit test

CHILD PASSENGER SAFETY LAWS

- Know the laws in your state
- [http://www.iihs.org/iihs/topics/laws/safetybeltuse](http://www.iihs.org/iihs/topics/laws/safetybeltuse)
  - For all age levels
  - Effective date
  - Level of enforcement
  - Penalties for violation
CHILD PASSENGER SAFETY RESOURCES

- www.safekids.org
- http://www.preventinjury.org/Special-Needs-Transportation

PEDESTRIANS
WHY ARE OTS CONCERNED WITH PEDESTRIAN TRAVEL?

- Clients live within communities
- Walking is healthy
  - Shown to build/sustain bone density
  - Can battle childhood obesity
  - Improves overall health
- Even drivers have to walk to/from their car

TACKLING PEDESTRIAN ISSUES

- Education
- Program development
- Infrastructure
- Community-based
- Policy implications
PEDESTRIAN ISSUES IMPACT ON OCCUPATION

- Helpful to consider occupational performance models
- Person, Occupation, & Environment all influence occupational performance

Ecology of Human Performance (Dunn, Brown, & McGuigan, 1994)
Person-Environment-Occupation model (Law, et al., 1996)

WALKABILITY CHECKLIST

Collaborative effort between the following agencies:

http://www.walkableamerica.org/checklist-walkability.pdf
WALKABILITY CHECKLIST

1. Did you have room to walk?
   - Yes
   - Some problems:
     - Sidewalks or paths started and stopped
     - Sidewalks were broken or cracked
     - Sidewalks were blocked with poles, signs, shrubbery, dumpsters, etc.
     - No sidewalks, paths, or shoulders
     - Too much traffic
     - Something else ____________________________
   Locations of problems: __________________________
   Rating: (circle one) ____________________________
   1 2 3 4 5 6 ____________________________

2. Was it easy to cross streets?
   - Yes
   - Some problems:
     - Road was too wide
     - Traffic signals made us wait too long or did not give us enough time to cross
     - Needed striped crosswalks or traffic signals
     - Parked cars blocked our view of traffic
     - Trees or plants blocked our view of traffic
     - Needed curb ramps or ramps needed repair
     - Something else ____________________________
   Locations of problems: __________________________
   Rating: (circle one) ____________________________
   1 2 3 4 5 6 ____________________________

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WALKABILITY CHECKLIST

3. Did drivers behave well?
   - Yes
   - Some problems: Drivers...
     - Backed out of driveways without looking
     - Did not yield to people crossing the street
     - Turned into people crossing the street
     - Drove too fast
     - Sped up to make it through traffic lights or drove through traffic lights?
       - Something else _________________________
       - Locations of problems: _______________
   - Rating: (circle one) __________________________
   - 1 2 3 4 5 6 __________________________

WALKABILITY CHECKLIST

4. Was it easy to follow safety rules?
   - Yes
   - No
   - Cross at crosswalks or where you could see and be seen by drivers?
   - Yes
   - No
   - Stop and look left, right and then left again before crossing streets?
   - Yes
   - No
   - Walk on sidewalks or shoulders facing traffic where there were no sidewalks?
   - Yes
   - No
   - Cross with the light?
   - Locations of problems: __________
   - Rating: (circle one) __________________________
   - 1 2 3 4 5 6 __________________________

12/20/2016
WALKABILITY CHECKLIST

5. Was your walk pleasant?
   ✔ Yes  ❌ Some unpleasant things:
      ❌ Needed more grass, flowers, or trees
      ❌ Scary dogs
      ❌ Scary people
      ❌ Not well lighted
      ❌ Dirty, lots of litter or trash
      ❌ Dirty air due to automobile exhaust
      ❌ Something else __________________________
      Locations of problems: _____________
   Rating: (circle one) __________________________
   1 2 3 4 5 6 __________________________

How does your neighborhood stack up?
Add up your ratings and decide.

1. _____  26-30 Celebrate! You have a great neighborhood for walking.
2. _____  21-25 Celebrate a little. Your neighborhood is pretty good.
3. _____  16-20 Okay, but it needs work.
4. _____  11-15 It needs lots of work. You deserve better than that.
5. _____  5-10 It's a disaster for walking!

Total _____
WALKING PROGRAMS

- Community based programs
  - To / from school
  - Stay at home mothers
  - Teens
- Venues
  - Malls
  - Neighborhoods
  - School tracks
- Benefits
  - Exercise
  - Social participation
  - Community connectedness

WALKING PROGRAMS

- Safe Routes to School
- Coordinated efforts between
  - Educators
  - Parents
  - Public officials
  - Law enforcement
  - Children
  - Engineering
- Manages drop-off/pick-up
- Walking School Buses and Bike Trains
- Built in program evaluation
SUPPORTING PEDESTRIAN ACTIVITY

- Audiences
  - Walkers (children and adults)
  - Drivers
  - Bicyclists
  - Roadway engineers
- Walkable Communities  [www.walkable.org](http://www.walkable.org)
- Educational program [http://www.pedbikeinfo.org/pedsaferjourney/](http://www.pedbikeinfo.org/pedsaferjourney/)
- SafeKids Walk this Way [http://www.safekids.org/walk-way](http://www.safekids.org/walk-way)
AREAS OF BICYCLING CONCERN

- Bicycle helmets
- Rules of the road
- Bicycle programs

IMPORTANCE OF BIKE HELMETS

- Properly fitted
- Reduces risk of head injury as much as 85%
- Reduces risk of brain injury as much as 88%
- More children age 5 - 14 go to ER for bike injuries than with any other sport
- Should be worn for EVERY bike ride
**CHOOSING A BIKE HELMET**

- Fits now rather than one that will fit when you grow
- Is comfortable – more likely to wear it
- Desirable design/color – more likely to use
- Increased cost does not mean increased safety

**FITTING A BIKE HELMET**

How to correctly fit a bike helmet:

1. Two fingers above your eyebrows to the bottom of your helmet
2. Four fingers to make a V-shape around the bottom of your ears
3. One finger under the strap beneath your chin
BIKE HELMET LAWS

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SAFE BIKING

- Always wear a helmet
- Also for other wheeled equipment (skates, scooters, etc)
- Proper rider-bike fit
  - Space between rider and top bar
    - 1 – 2” on a road bike
    - 3 – 4” on a mountain bike
  - Level seat front to back
- Seat height allows slight knee flexion when leg is fully extended
- Handle bar height same as seat height
- Follow the rules of the road
- Inflate tires
- See and be seen (bright fluorescents rather than white)
- Control the bike
- Avoid night riding
RULES OF THE ROAD

- Go with the flow of traffic
- Obey all traffic laws
  - A bicycle is a vehicle and the rider is the driver
- Yield to traffic when appropriate according to traffic rules
  - Bikes are lighter and easier to stop than a 2000 lb. vehicle
  - Also yield to pedestrians who have already entered a crosswalk
- Ride predictably in a straight line, signaling moves to others
- Stay alert at all times
  - Visual and auditory stimulus, no head sets
- Look before turning
- Watch for parked cars

WHERE TO RIDE

- Safest place for bicycle riding is on the street
- Children <10 years old are not mature enough to make the decisions necessary to safely ride in the street.
  - Children <10 years old are better off riding on the sidewalk
- For anyone riding on a sidewalk:
  - Check the state law to determine sidewalk riding is permitted
  - Watch for vehicles coming out of or turning into driveways
  - Enter a street at a corner and not between parked cars
  - Alert nearby pedestrians by saying, “Excuse me,” or, “Passing on your left,” or use a bell or horn
BICYCLE PROGRAMS

• Unit 1: Getting Ready to Ride
• Unit 2: Bicycle Handling Basics
• Unit 3: Emergency Bicycle Handling Skills
• Unit 4: Advanced Bicycle Handling Skills
• Unit 5: Rules of the Road for Riding
• Unit 6: Bicycle Maintenance
• Unit 7: Riding for Fitness
BICYCLING RESOURCES

- Bikeability checklist
- Bikeology curriculum
- National Highway Safety Administration curricula, activities, Spanish language materials
  - http://www.nhtsa.gov/Bicycles

TEEN DRIVERS
COMING OF AGE

• Teens are still adolescents with immature frontal lobes
• Typically developing teens have pre-driving mobility experiences

ROLE OF GENERALIST VS SPECIALIST
**Generalist:**
- Inquire about driving needs
- Educate about driving implications from diagnosis
- Assess skills used in driving and comm. mobility
- Identify driving needs
- Develop skills related to driving
- Determine if a referral is needed then refer
- Address deficits identified by specialist

**Driving Rehab Specialist:**
- Educate generalist about what to look for in clients; red flags or predictive performance
- Train generalists in screening tools
- Inform generalists about community resources including driving evaluation
- Evaluate driving
- Determine fitness to drive
- Provide intervention to learn to drive

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**Billy**
- 15 years old
- Diagnosed with ASD and SPD

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**EVALUATION OF DRIVING**
CLINICAL ASSESSMENT

- Tests of client skills / deficits
- Battery of assessment tools
- What constructs are being measured
  - Vision
  - Cognition
  - Motor performance
- What does the literature say about a relationship to driving?
  - Predictability of crashes
  - Indicative of driving performance

VISION/PERCEPTION ASSESSMENT TOOLS

- Vision important to assess to ensure adherence with state guidelines
- Acuity most commonly has state minimum (typically 20/40-20/70)
- Visual fields minimums often identified
- Use traditional visuals screens and refer to eye care specialist for concerns
- Visual scanning is critical to capture driving environment
COGNITIVE ASSESSMENT

- Diagnoses of concern:
  - ASD
  - ADHD
  - Learning disabilities
  - Low IQ

- Skills assessed:
  - Ability to read
  - Interpreting non-verbal language
  - Understanding abstract ideas
  - Visual-perceptual-motor
  - Planning
  - Organization
  - Attention
  - Processing speed
  - Problem solving

MOTOR PERFORMANCE ASSESSMENT

- Consider ability to:
  - Transfer in and out of vehicle
  - Operate vehicle controls
    - Steering wheel
    - Foot pedals
    - Key in ignition
  - Sustain movement or position
  - Feel where limbs are in space
WHAT DOES IT ALL MEAN?

- Performance on assessment tools paints a picture
- Outlines what you MIGHT see during the road test
- Clinic based tests do not definitively predict crashes or performance

ROAD TEST

- Assesses driving in naturalistic environment
- Provides real life perceptual challenges
- Sensory feedback while driving with consequences
- Progressively complex environments
- Real life problem solving
- INVALUABLE in making clinical determinations about safety
THE GOALS

- Must balance independent performance with safety
- Should meet client’s need for desired community mobility
- Should consider all possibilities of intervention approaches
- Should foster engagement and participation in community mobility
ESTABLISH OCCUPATIONAL PERFORMANCE

- Directed toward developing safe function
- Strategies are focused on the person
  - Engagement in the occupation of driving is the end result
  - Emphasis is placed on restoration of performance skills

ESTABLISH INTERVENTIONS

- Exercise Programs
  - Strength / ROM / Coordination
- Cognitive Training
  - Memory
  - Attention
  - Reasoning
  - Scanning
  - Problem solving
  - Route planning
MODIFY INTERVENTIONS

- Vehicle modifications
  - Therapists should never modify a vehicle
  - Only trained specialists should recommend adaptive equipment
  - Clients should be trained on equipment prior to installation
  - Equipment needs are unique to the client

COMMONLY USED EQUIPMENT

SPINNER KNOB

CONSIDERATIONS
- Most frequently used steering device
- Requires functional grasp
- Mounted within available reach
- Often recommended secondary to another necessary adaptation
COMMONLY USED EQUIPMENT

HAND CONTROLS

CONSIDERATIONS

- Replaces use of vehicle installed accelerator and brake
- Multiple planes of movement for operation
- Client ROM, strength, vehicle, and size of occupant cabin dictate which controls
- Original pedals still work for other driver
- Takes considerable practice to acclimate to new motor habits

COMMONLY USED EQUIPMENT

PEDAL BLOCK

CONSIDERATIONS

- Prevents accidental lower extremity application of gas/brake by users of hand controls
- For individuals with uncontrollable lower extremity movements, which may include spasms, or other movements
COMMONLY USED EQUIPMENT

PEDAL EXTENDERS

CONSIDERATIONS
- Allows reach to foot pedals while maintaining a safe distance from the airbag
- Can be clamp on- allowing 1-4 inches of extension
- Can be adjustable fold down to allow 6-12 inches of extension

SPECIALTY MIRRORS

CONSIDERATIONS
- Typically convex to expand viewable area
- Assists driver in seeing vehicles in their blind spot without distorting image
- Important for individuals with limited neck and trunk mobility
COMMONLY USED EQUIPMENT

SEATING AND TRANSFER ASSIST CONSIDERATIONS

- Seating and transfer needs are not only for the drivers

SCHOOL BUSES
SCHOOL BUS SAFETY

- Physics behind occupant protection
  - Buses weigh over 10,000 lbs and therefore distribute crash forces differently than cars
  - Resulting crash forces of buses are less than crash forces by car occupants
- Crash protection mechanism is called "compartmentalization."
  - Children are protected without the need to buckle-up in a protective envelope consisting of strong, closely spaced seats that have energy-absorbing seat backs

COMPARTMENTALIZATION

THIS is compartmentalization

This is NOT compartmentalization
SCHOOL BUS CONSIDERATIONS

- Bus stop safety
- Entry and exit to the bus
- Seating / positioning
- Adaptive equipment needs
- Route from bus to class
- Finding bus at close of school
- Awareness to disembark

What will you do to address community mobility in practice?
Questions
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