

# Assessment Models & Caregiver Buy-in

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# Farmer, sugarmaker, engineer, learning on-the-job ATP

- ▶ Worked on a blueberry farm, hog farm, beef feed lot, and dairy/cash crop farm.
- ▶ Started a rotational grazing dairy farm, maple sugarbush, and market vegetable farm.
- ▶ Currently an agricultural engineer ATP/RET for AgrAbility, operate small farm with 350-tap sugarbush, 200 laying hens, 25 broilers, 2 milk cows, 12 goats & 4 pigs.





# Learning Objectives

- ▶ What is assistive technology (AT)
- ▶ Common causes for abandoned assistive technology
- ▶ The human, activity, context, and assistive technology (HAAT)
- ▶ Learn where to find AT options
- ▶ Become familiar with AT terminology



# What is Assistive Technology (AT)?

Any item, piece of equipment, or product system,  
whether acquired commercially, modified, or customized,  
that is used to increase, maintain, or improve  
functional capabilities of individuals with disabilities.

(Assistive Technology Act of 1998)





# Physical Abilities Needed for Farming

- Place a value your time.
- Do most important things FIRST!
- Evaluate your farm enterprises, and spend time on profitable efforts.
- Be more efficient at things that need done most frequently. DAILY CHORES!
- Invest in tools and equipment that give you the abilities you need to get essential tasks done on time.



# Vegetables: Greenhouse production

- Trellis systems with suspended twine spools
  - Overhead reaching or climbing step-stools to lower and lean vines weekly
  - Pruning vines at knee level weekly
  - Climbing and fine motor skills

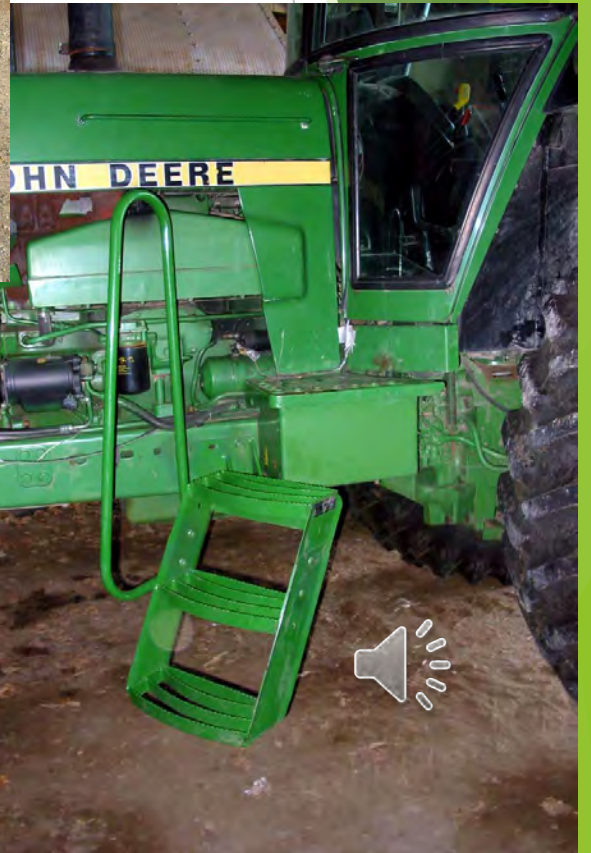




# Accommodate Shoveling







Not  
conventional  
farm equipment





# Goals of AT Assessment

- ▶ To gain first-hand observations of potential barriers and resources
- ▶ To evaluate the client's ability to **safely** complete desired work-related tasks
- ▶ To inventory assets available as a basis for developing alternative solutions, including new enterprises



# Goal of an AT Assessment

- ▶ Help the person with disability meet their outcome measures with proper AT.
- ▶ Finding the right AT the first time saves time and resources!
- ▶ Is success being able to operate the AT well, or getting the job done?





# Goal of an AT Assessment

- ▶ The wrong AT may be worse than no AT
  - ▶ Frustrated with poor outcomes
  - ▶ Worsened medical condition
  - ▶ Reduced function or efficiency
  - ▶ Inconvenient for other workers



# Outcomes of Assessment

- ▶ Better understand farming operation, client's role on the farm, and modifications needed
- ▶ Identify significant workplace barriers and functional limitations
- ▶ Opportunity to discuss desired modifications, task restructuring, or reassignment.
- ▶ Identify specific client goals





I thought I could use it to reach the sky, but I can't

My caregiver won't learn to use it

My MS is worse and I can't hold it

I don't know how to use that thing

I broke my leg when I used it

I never even needed that

It makes me look fat

wrong color

It's too wide

It's too long

I never did like doing that task and never want to do it again

Canes are for sissies

I really don't think I can do anything

Electronics scare me

It broke and costs too much to fix

**ABANDONMENT**



# Abandonment

1. Unmet consumer goals
2. Unmet caregiver goals
3. Lack of skills
4. Unrealistic expectations
5. Unmotivated
6. Intimidated
7. Functional abilities/needs have changed
8. Self-esteem
9. Lack of training

1. I'm scared of electronics
2. My MS is worse now
3. I really don't think I can do anything.
4. I never even needed that
5. I thought I could use it to reach, but can't
6. I never liked that task
7. My caregiver won't learn to use it
8. I broke my leg using it
9. I don't know how to





# Abandonment

- ▶ Very critical to include the customer in the AT assessment process!
- ▶ and include caregivers in the assessment!



# Principles for Providing AT

- ▶ Do no harm



# Principles for Providing AT

- ▶ Keep the consumer and their goals as the central focus
- ▶ Focus on functional abilities and potential





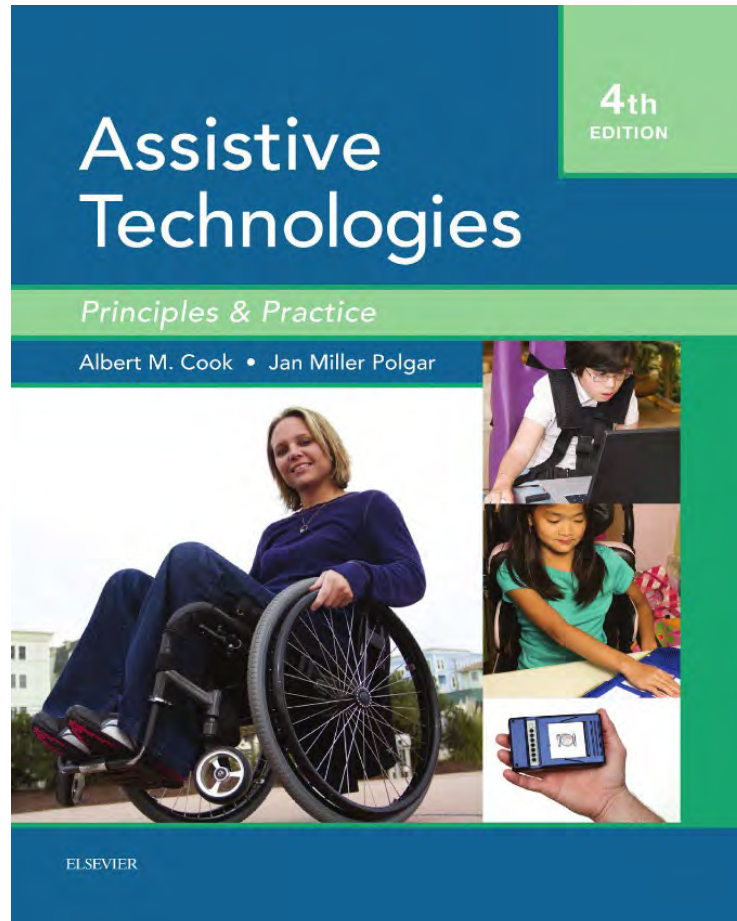
# Principles for Providing AT

- ▶ Offer the simplest but still effective solutions





# Human Activity Assistive Technology Model (HAAT)



Cook, Albert M., and Susan M. Hussey. *Assistive Technologies: Principles and Practice*. St. Louis: Mosby, 2002. Print.



# Human Activity Assistive Technology Model (HAAT)

Method to understand the appropriate place of assistive technologies in the life of a person with a disability.



Accounts for the human, the context and the activities



VERY LAST we identify potential interventions (AT solutions) that match the outcome measures (goals)



# HAAT Human considerations

## Physical

- ▶ Age, size
- ▶ Medical diagnosis
- ▶ Functional limitations





# HAAT Human considerations

- ▶ Emotional
- ▶ Cognitive
- ▶ Expertise



# Human Activity Assistive Technology Model (HAAT)

## CONTEXT -

Environment: extreme temps, exposure to elements, dust, humidity, rough terrain

Social: family, employees, finances, legal, pain management, opinions about doctors

Culture: work expected, farm is identity, food safety, government





# HAAT Context - environment

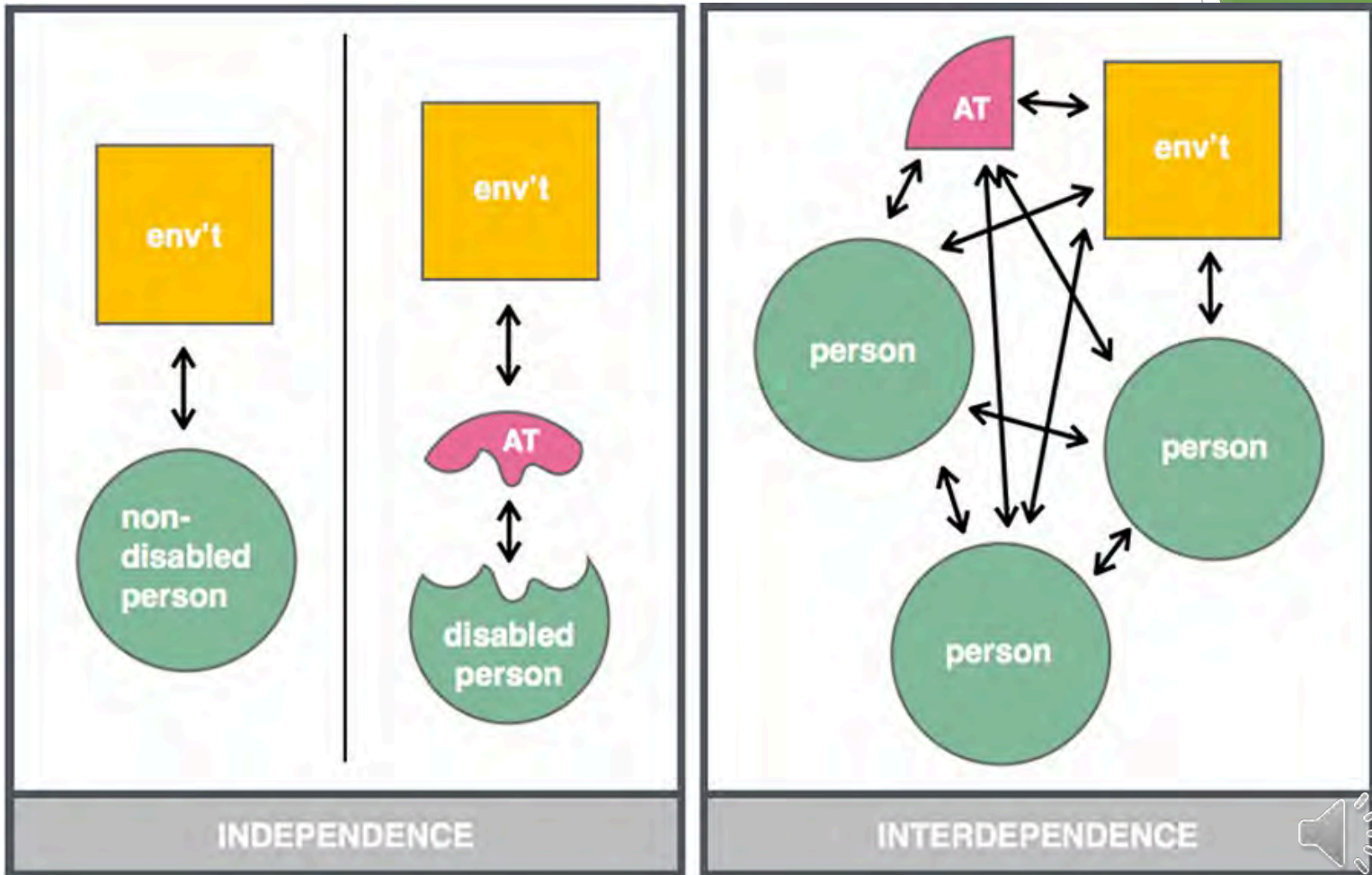




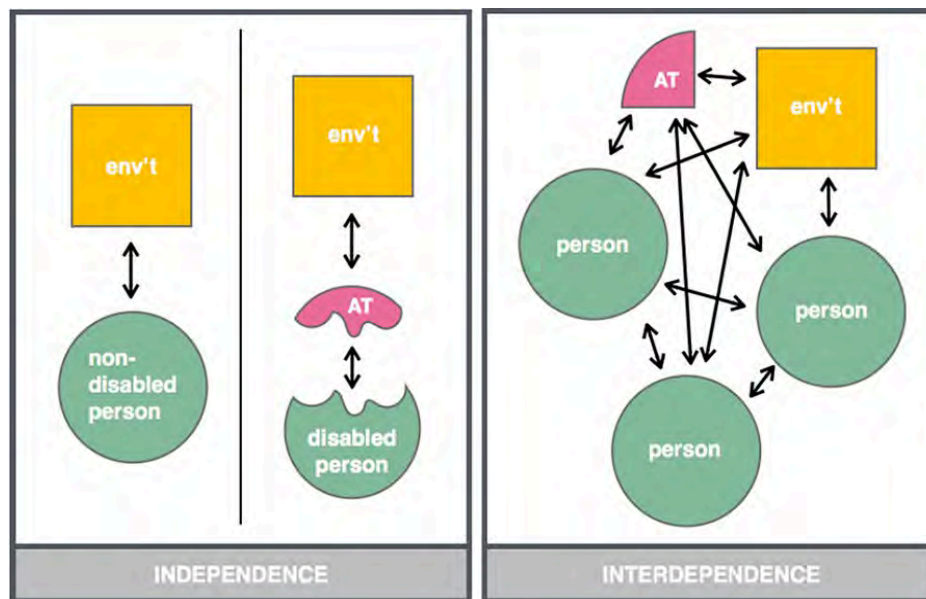
# HAAT Context - social



# Other Models: Interdependence Model



# Other Models: Interdependence Model



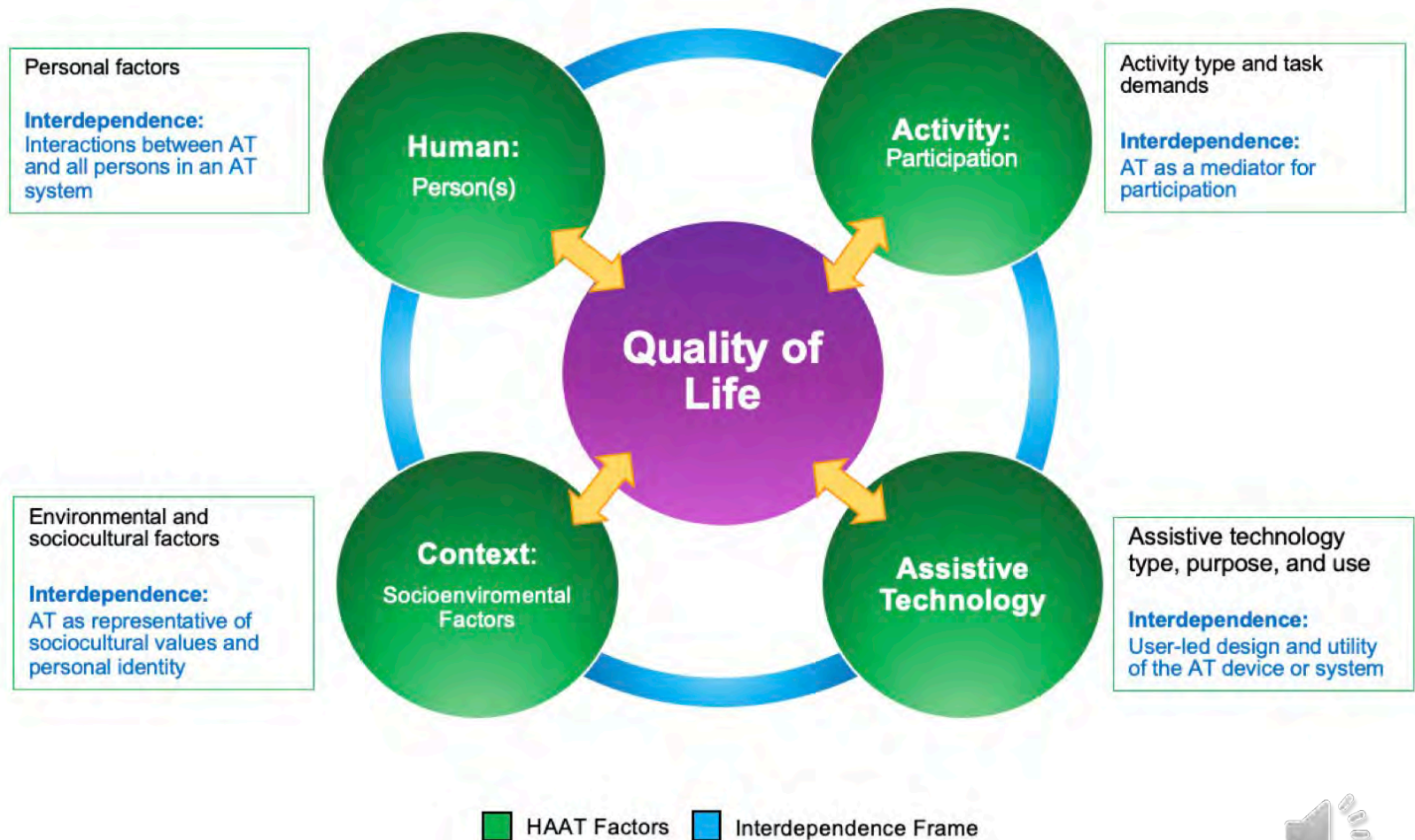
## Comparison of the Independence and Interdependence Frames for Assistive Technology [4]

An independence frame (left) emphasizes an individual's relationship with the environment. Assistive technology (AT) devices are meant to bridge a perceived gap between disabled bodies and environments designed for non-disabled people. An interdependence frame (right) emphasizes the relationships between people, ATs, and environments, drawing out the roles of those with disabilities during collective work they do to create access. Reprinted from Bennett, C. L., Brady, E., & Branham, S. M. (2018).

*Interdependence as a frame for assistive technology research and design. Proceedings of the 20th International ACM SIGACCESS Conference on Computers and Accessibility, 161–173. Copyright (2018), with permission from Dr. Cynthia L. Bennett, University of Washington.*



# Other Models: iHAAT



**Figure** The i-HAAT: A Merged Conceptual Framework of the Human Activity Assistive Technology Model and Interdependence Frame of Assistive Technology

# Caregiver Buy-in

- ▶ Why is it important?
  - ▶ Device Abandonment
  - ▶ Ownership
  - ▶ Investment
- ▶ How do we get buy-in?
  - ▶ Rapport, rapport, rapport



# Caregiver Buy-in

- ▶ Who are they?
  - ▶ Think about... caregivers for - live, work, play
  - ▶ carryover
- ▶ Caregivers for non-AT
  - ▶ Non-AT technology: having cellphone charged, managing “families” within a smart device
  - ▶ Non-AT non-tech: scheduling cares around the need for accessing technology, assistance in ADL more on days AT being used





# Human Activity Assistive Technology Model (HAAT)

- ▶ Activity - when a person lacks the capacity to complete a task, the manner must be changed by using AT
  - ▶ Hundreds of activities
  - ▶ Farm, house, personal
  - ▶ How do we prioritize?
    - ▶ Remember the person
    - ▶ Remember the context



# HAAT Activity

- ▶ Fill flats, seeding, watering, light adjustment, pot filling, transplanting, carrying pots, tillage, mulch, weeding, irrigation, spraying, cultivating, pruning, harvest, washing, packaging, transporting, sales, book keeping, field clean up



# Vegetables: Greenhouse propagation

Watering, watering, Watering!

- Filling pots and trays with soil (60-lb bales)
- Seeding trays and rooting cuttings
- Transplanting seedlings to flats or pots
- Monitoring temperature, moisture, & pests
- Lifting soil, scooping, carrying, pulling hoses, walking. Lower-weight lifting, but higher repetition and fine motor skills.
- Mid-February and March full-time in the greenhouse.





# Vegetables: Greenhouse production

- Greenhouse harvest is in small, contained area
  - Less walking
  - Trellis and hydroponic systems can be with less bending
  - Less lifting and carrying and washing produce



# Vegetables: Greenhouse production

- Planting into soil or mulched beds
  - digging with broadfork and wheelbarrow mulch
  - Direct seed into beds or hand-transplant
  - bending, kneeling, crawling, stooping, fine motor skills and reaching





# Vegetables: Greenhouse production

- Hydroponic trays, soil troughs, and floating beds
  - light weight work, high production
  - plumbing, fertilizer, fine motor skills
  - Facility and management





# Vegetables: Field production

- Tillage with tractor tilling equipment or walk-behind tiller
- Laying plastic mulch and drip irrigation
- Transplanting with mechanical transplanter or by hand – riding behind tractor or crawling
- Trellises – pounding stakes and wrapping twine
- Long days of climbing on tractors, walking, stooping, bending, kneeling, fine motor tasks



# Vegetables: Field production

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# Livestock: Daily Chores

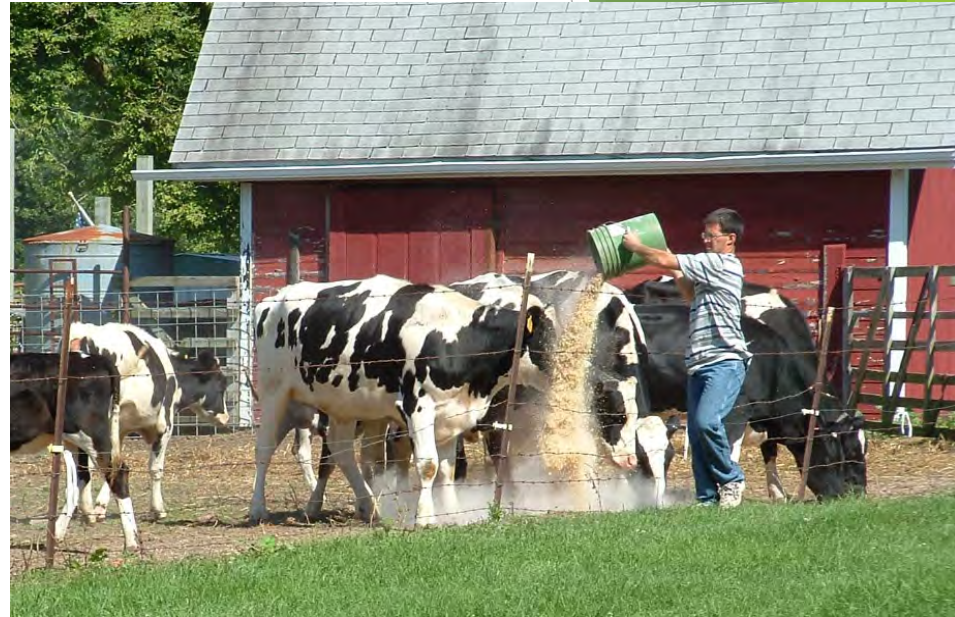
- Typically 1 - 2 hour chores twice daily
- Feed, water, bedding
- Gathering, washing, candling eggs, milking and cleaning up parlor
- 50% longer time in winter due to frozen and snowy conditions.
- Organize chores for maximum time savings
- Walking, lifting, carrying, pushing, pulling, bending, stooping, shoveling





# Livestock: Daily Chores

- Feed...the animals eat before we do.
  - 50-lb feed bags or 25-lb 5-gal. pails of grain
  - 40-lb hay bales or rolling ~1000 lb bales
  - Jostling animals & dusty!
  - Climbing tractor steps 8 times to feed round bale in feed lot...20" high step x 8!
- Water
  - Pulling hoses or carrying 5-gal. pails ~40 lb.
  - Breaking ice & thawing hoses
- Bedding
  - 25-lb straw bales or ~700 lb large round bale



# Livestock: Herd Health

- Corralling, Sorting, Restraining livestock
- Shots, Shearing, trimming, tagging, etc.
- Lambing, calving, farrowing seasons will be around-the-clock work for several weeks
- Loading and hauling
- Lots of running, scrambling, opening gates, and fine motor skills giving health care
- Time depends on herd size but plan on an average 2 days per month with herd health





# Livestock: Material Handling

- Hauling feed & bedding to the farm & storing it
  - 50 to 100-pound feed bags
  - 40-lb. bales of hay and straw
- Cleaning pens
  - Pitchfork/wheelbarrow is low cost, long time
  - Skid steer is high cost, immense time savings – high priority investment
- Hauling manure climbing on/off equipment
- Lifting, carrying, pushing, pulling, shoveling, scooping – hard on the back!





# Field Crops: Hay

- Highly weather dependent and equipment and labor intensive
- Mow from 2 to 5 times per summer depending on latitude and weather
- Drive over the same field up to 15 times!
- Many hours of equipment operation mowing, raking, baling, hauling
- Heavy, repetitive lifting and twisting for less mechanized small square bale operations
- Direct customer sales will take time, but generate better sales



# Field Crops: Grain

- Highly mechanized
- Manual labor is hitching equipment and repairs and maintenance on facilities and equipment
- Climbing grain bin ladders will require strong arms and legs
- Cleaning out bins will require shoveling and sweeping in dusty conditions
- Many hours operating equipment
- High investment in equipment



# Physical Abilities Needed for Farming

- Timing is crucial. The work needs done at proper times and seasons regardless of the farmer's preference.
- The farmer needs to be able to get all the necessary tasks done on time.
- You can only get up so early and stay up so late! 24 hours runs out.
- If it hurts to work and is unpleasant, there is less motivation to do it, and less likelihood of success on the farm.





# Prioritize tasks to accommodate

- ▶ Are you safe doing it?
- ▶ Is it financially important?
- ▶ How frequent is it?
- ▶ Could other workers do the task?
- ▶ Do you like to do it?
- ▶ How easy is it to accommodate?



# Human Activity Assistive Technology Model (HAAT)

- ▶ To provide interventions that meet the outcome measures:
  - ▶ Consider the person
  - ▶ Consider the context
  - ▶ Consider the activity
- ▶ Identify Assistive Technology last!



# Who can help us with information resources?

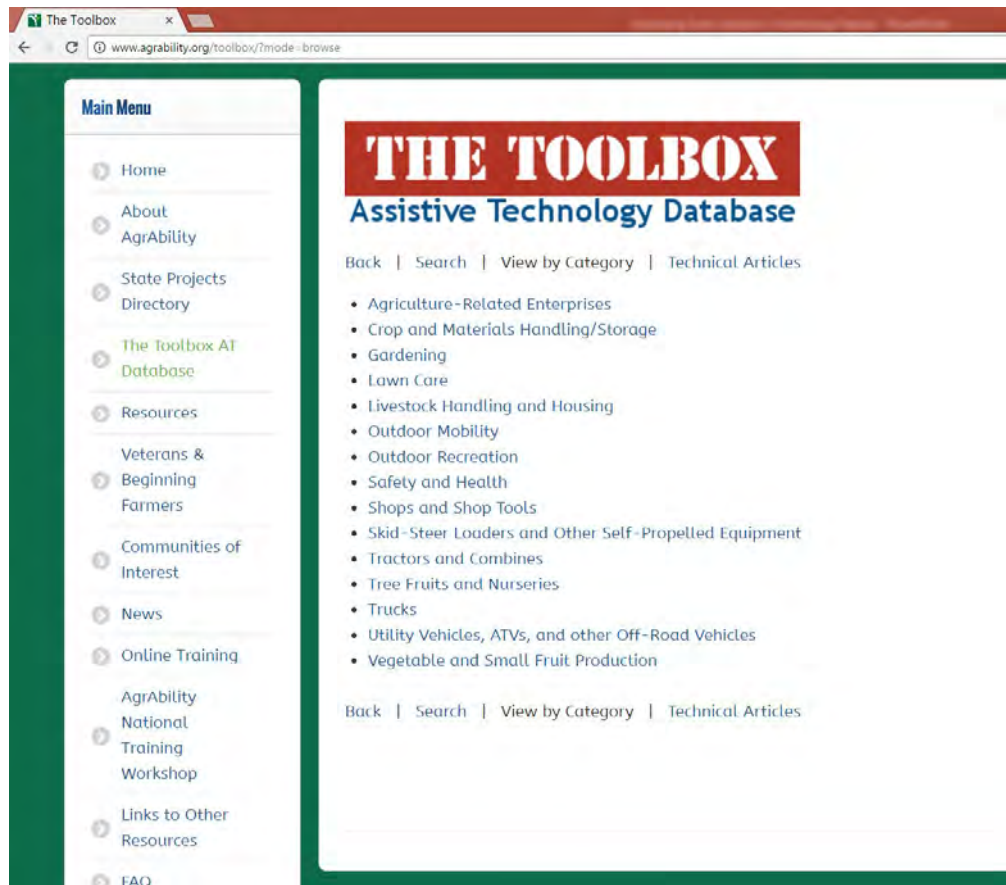
- ▶ For agriculture-specific commercial and DIY AT, emerging technologies, appropriate service providers, and training opportunities stay in touch with National AgrAbility social media and [www.AgrAbility.org](http://www.AgrAbility.org)
- ▶ For general disability-relevant policies and regulations, advocacy and training opportunities contact your Center for Independent Living  
<https://www.ilru.org/projects/cil-net/cil-center-and-association-directory>
- ▶ For general commercial AT, emerging technologies, and relevant AT research contact your state AT Act Program  
<https://ataporg.org/>
- ▶ For job accommodations [www.askJan.org](http://www.askJan.org)
- ▶ Beware homesteader videos on youtube!!!





# Agricultural AT Availability

[www.AgrAbility.org/toolbox](http://www.AgrAbility.org/toolbox)



The screenshot displays the website's interface. On the left is a 'Main Menu' with links to Home, About AgrAbility, State Projects Directory, The Toolbox AT Database (highlighted), Resources, Veterans & Beginning Farmers, Communities of Interest, News, Online Training, AgrAbility National Training Workshop, Links to Other Resources, and FAQ. The main content area features a red header with 'THE TOOLBOX' in white and 'Assistive Technology Database' in blue. Below this is a navigation bar with 'Back | Search | View by Category | Technical Articles'. A list of categories follows, including Agriculture-Related Enterprises, Crop and Materials Handling/Storage, Gardening, Lawn Care, Livestock Handling and Housing, Outdoor Mobility, Outdoor Recreation, Safety and Health, Shops and Shop Tools, Skid-Steer Loaders and Other Self-Propelled Equipment, Tractors and Combines, Tree Fruits and Nurseries, Trucks, Utility Vehicles, ATVs, and other Off-Road Vehicles, and Vegetable and Small Fruit Production. A second navigation bar is located at the bottom of the list.

**THE TOOLBOX**  
Assistive Technology Database

Back | Search | View by Category | Technical Articles

- Agriculture-Related Enterprises
- Crop and Materials Handling/Storage
- Gardening
- Lawn Care
- Livestock Handling and Housing
- Outdoor Mobility
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Back | Search | View by Category | Technical Articles







# Conducting Agricultural Worksite Assessments

A USER'S GUIDE FOR PROFESSIONALS ASSISTING FARMERS AND RANCHERS WITH PHYSICAL DISABILITIES IN IDENTIFYING AND OVERCOMING WORKPLACE BARRIERS



Purdue University is an Equal Opportunity/Equal Access institution.

## Evaluating Agricultural Workplace Assistive Technology for Secondary Injury Hazards

An Assessment Tool for Professionals Who Assist Farmers and Ranchers with Disabilities



 **AgrAbility**  
Cultivating Accessible Agriculture

**National AgrAbility Project**  
Breaking New Ground Resource Center  
Purdue University





# The Service Delivery Cycle

- ▶ Referral finding appropriate candidates for AT interventions by phone interview
- ▶ AT Assessment and evaluation of farm site with rehabilitation professionals
- ▶ Make a plan listing outcome measures and recommending AT interventions
- ▶ Implement the plan with the farmer, funders, AT suppliers, fabricators
- ▶ Follow-up to make sure AT is functioning as intended and outcome measures are met
- ▶ Follow along to revisit steps 2,3,4 as needed



# AT Assessment vocabulary

- Assistive technology - tools, methods, or systems used to increase functional capabilities for people with disabilities
- HAAT Assessment Model - a systematic process for determining the need for AT so a person with disabilities can complete necessary tasks
- Context - the setting that the person is working in - environmental, social, and cultural
- Goals - general statements that you hope to accomplish
- Intervention - AT provided or other action taken to improve the person's capabilities or health (what was done to help?)
- Outcome measures - specific measurable impact of the AT intervention on the ability of the person to complete a goal (did it work?)





# Questions?

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[www.MichiganAgrAbility.org](http://www.MichiganAgrAbility.org)

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