

# Position for Working: Exploring Trends in Assistive Technology



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



# AMAC

AMAC Accessibility is a social change organization on a mission to create affordable services for governmental, private and non-profits organization working with individuals with disabilities. Services include e-text, braille, captioning, assistive technology, office management software and consulting.

For more information, please visit our website at [www.amacusg.org](http://www.amacusg.org)



# Tools for Life Mission

We're here to help Georgians with disabilities gain access to and acquisition of assistive technology devices and assistive technology services so they can live, learn, work, and play independently in the communities of their choice.



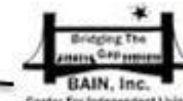




# The TFL Network



*The Middle Georgia Center for Independent Living, Inc.*



# Join our mailing list!



**Georgia Tech** **TOOLS for LIFE**  
Georgia's Assistive Technology Act Program

HOME ASSISTIVE TECHNOLOGY TFL NETWORK CALENDAR OF EVENTS

Search our Site

TRAINING  
FUNDING  
PUBLICATIONS  
TFL WIKI  
MEET THE TFL TEAM  
MEET THE ADVISORY COUNCIL  
DIRECTIONS/MAP  
JOIN OUR MAILING LIST  
SCHEDULE A TOUR

Welcome AT Services Try AT Get AT AT Guides Research

**Learn More about AT through Hands-On Demonstrations**

Welcome to Tools for Life

Tools for Life, Georgia's Assistive Technology Act Program, is dedicated to increasing access to and acquisition of assistive technology (AT) devices and services for Georgians of all ages and disabilities so they can live, learn, work and play independently and with greater freedom in communities of their choice.

Tools for Life and the TFL Network work collaboratively together to accomplish our mission through:

**IDEAS CONFERENCE**  
JUN 2 Epworth by the Sea, St Simons Island

**WEBINARS**  
MAY 28 Georgia's Leadership Model for Increasing Accessible ICT in State Government  
JUN 25 Learn More and Do More: Exploring Accessibility and Apps for Android  
JUL 30 Position for Work: A Closer Look at Workplace Accommodations & Assessments

Current Webinar Schedule  
Webinar Archives

**TOOLS FOR LIFE APPFINDER**

...for Living, Learning, Working, and Playing.

**AT ONLINE EXCHANGE**  
gTRADE

# Ergonomics in the Workplace

- Promoting full inclusion in workplace environments often includes knocking down simple physical barriers by building up everyone's skills and knowledge of the principles of ergonomics and understanding of assistive technology solutions. This presentation will **identify ergonomic challenges** that individuals with disabilities often face in their workplace environments. Presenters will share a range of **strategies that include the basic steps to identifying problem areas within the scope of a workplace assessment. Solutions will be shared** that can assist with **improving posture, enhance the ability to focus, reduce fatigue and save energy** all while promoting inclusion and productivity at work.

For Handouts: <http://www.gatfl.gatech.edu/tflwiki>

# Identify Ergonomic Challenges

# When is an evaluation needed?

- Proactive Prevention
- When working posture is affecting performance, attention, and creating pain
- **TIP: Consider incorporating ergonomic principles into the IWP to support workplace goals.**
  - Helps with breathing, circulation, attention, concentration & ultimately learning
  - Must consult with a trained professional
  - Educate everyone – individual, family, supervisors, peers



# Ergonomics

- Humans present with unique physical characteristics and abilities
- Goal is to fit the task, equipment and environment to the person
  - Design tasks
  - Work spaces
  - Tools/Equipment
  - Lighting



## Contributing factors for poor positioning (Office Setting)

- Non-adjustable workstations; the layout of the workstation does not fit the user
- Lack of knowledge on how to set up the workstation properly according to the user's needs ( both physical needs and job tasks)
- Poor working habits that remain uncorrected
- Fatigue and vision issues

# Poor Sitting Posture

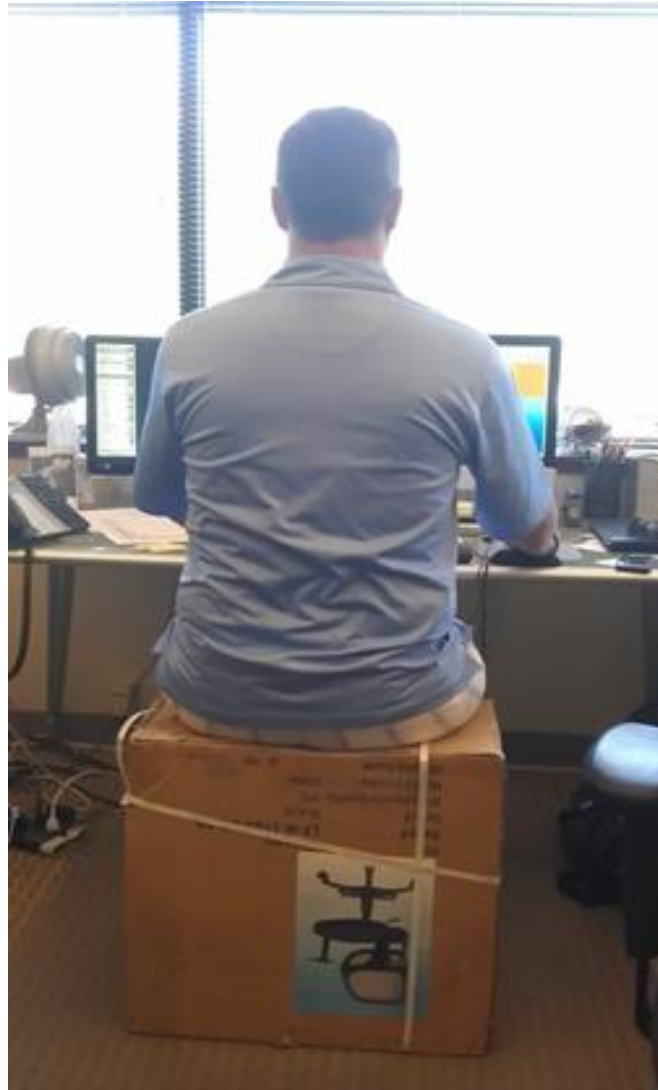


- Inhibits blood flow
- Creates muscle shortening
- Stresses back muscles and compresses spine
- Can inhibit focus
- Compresses diaphragm
  - Affects breathing
  - Voice quality



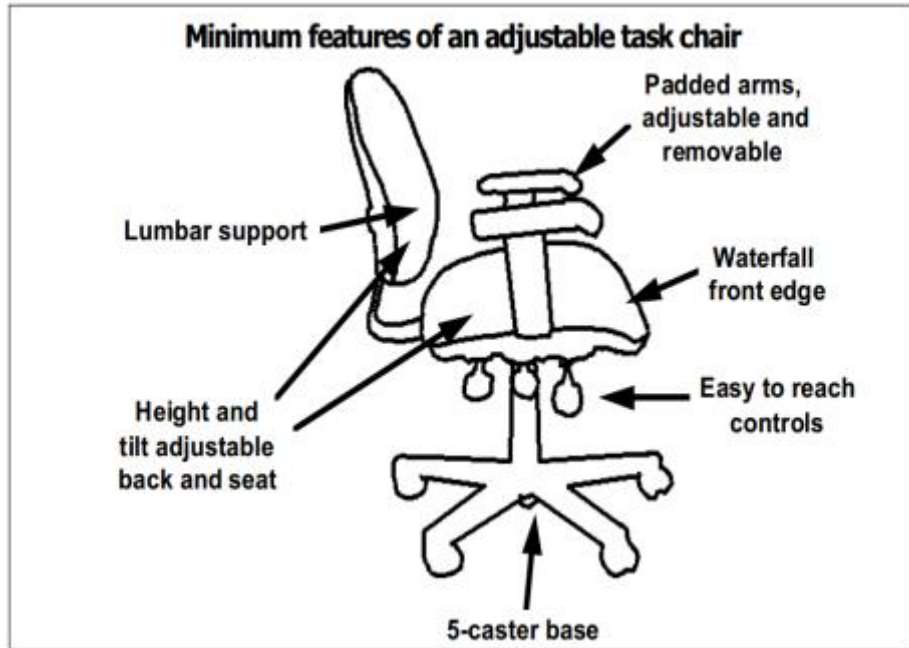
# **Solutions: Improving Posture**

# Chairs





# Guidelines



[www.lni.wa.gov](http://www.lni.wa.gov)

# Guidelines when sitting



- Proper height for desk or height adjustable if possible
  - boost height in a non-adjustable chair
- Thighs should not be in contact with the front edge of the seat
  - 2" to 3" between front edge of chair and back of knees
  - Use firm pillows or cushions to reduce seat depth
- Adjust the chair so feet are flat on the floor and thighs parallel to the floor
  - use foot rest or seat cushions to achieve proper posture
- wheelchair user feet should make good contact with footplates

# Are these good chairs?



# Answer.....



- Depends on the person, task and work environment



# Workstations



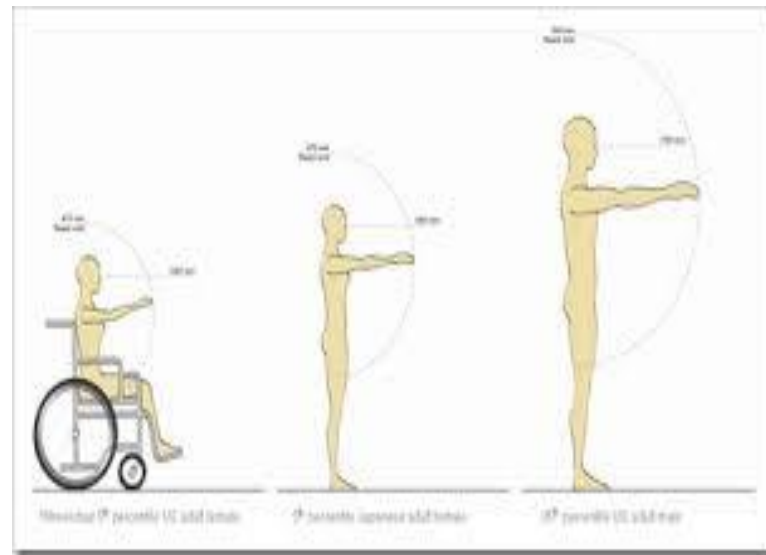
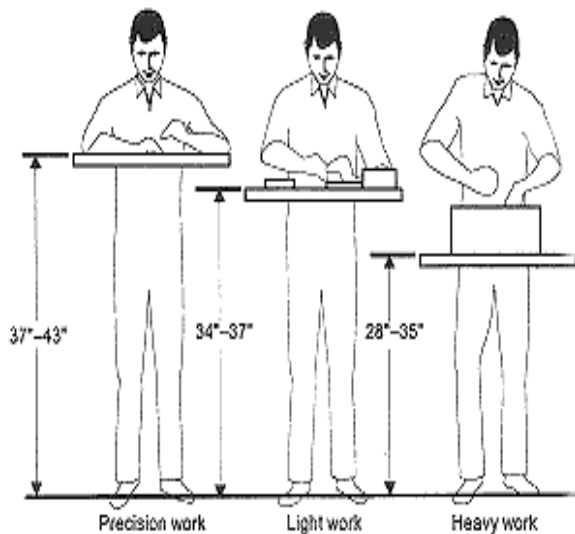
- Many options
- Stature considerations
- Task considerations
- Needs based on injury or disability





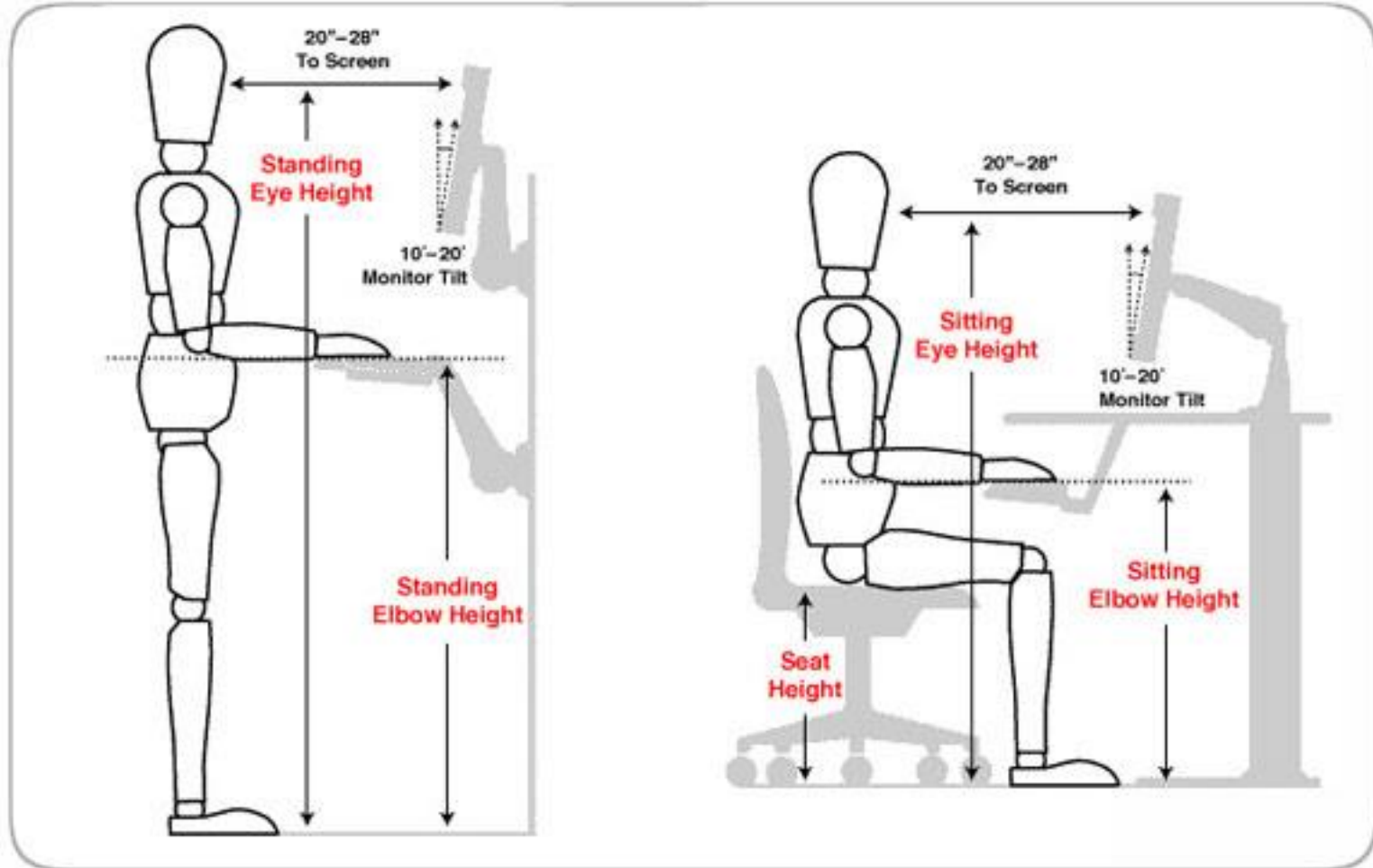
# Ergonomics

- Position will vary depending on the individual and the task



Completerehabolutions.com

# Ergonomics



# Wheelchair users

- Access for manual w/c user vs. power chair user is different
- Desks with cut outs; taller height
- May need computer accessories to improve access



# Accessories

- Monitor holder/stands
- Document and phone holders
- Keyboard trays

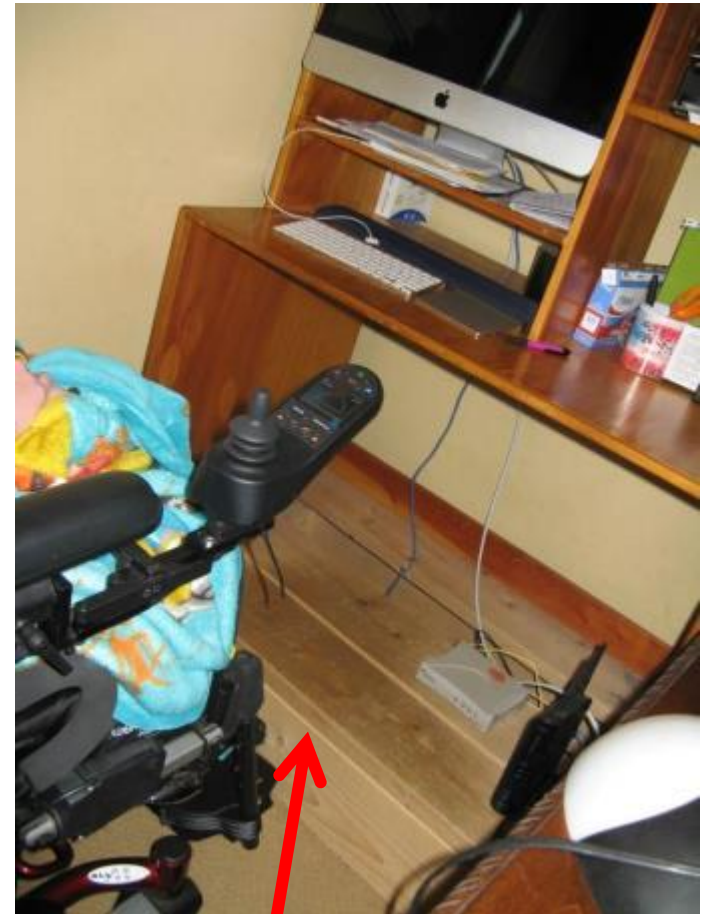


# Modifications





# Modifications

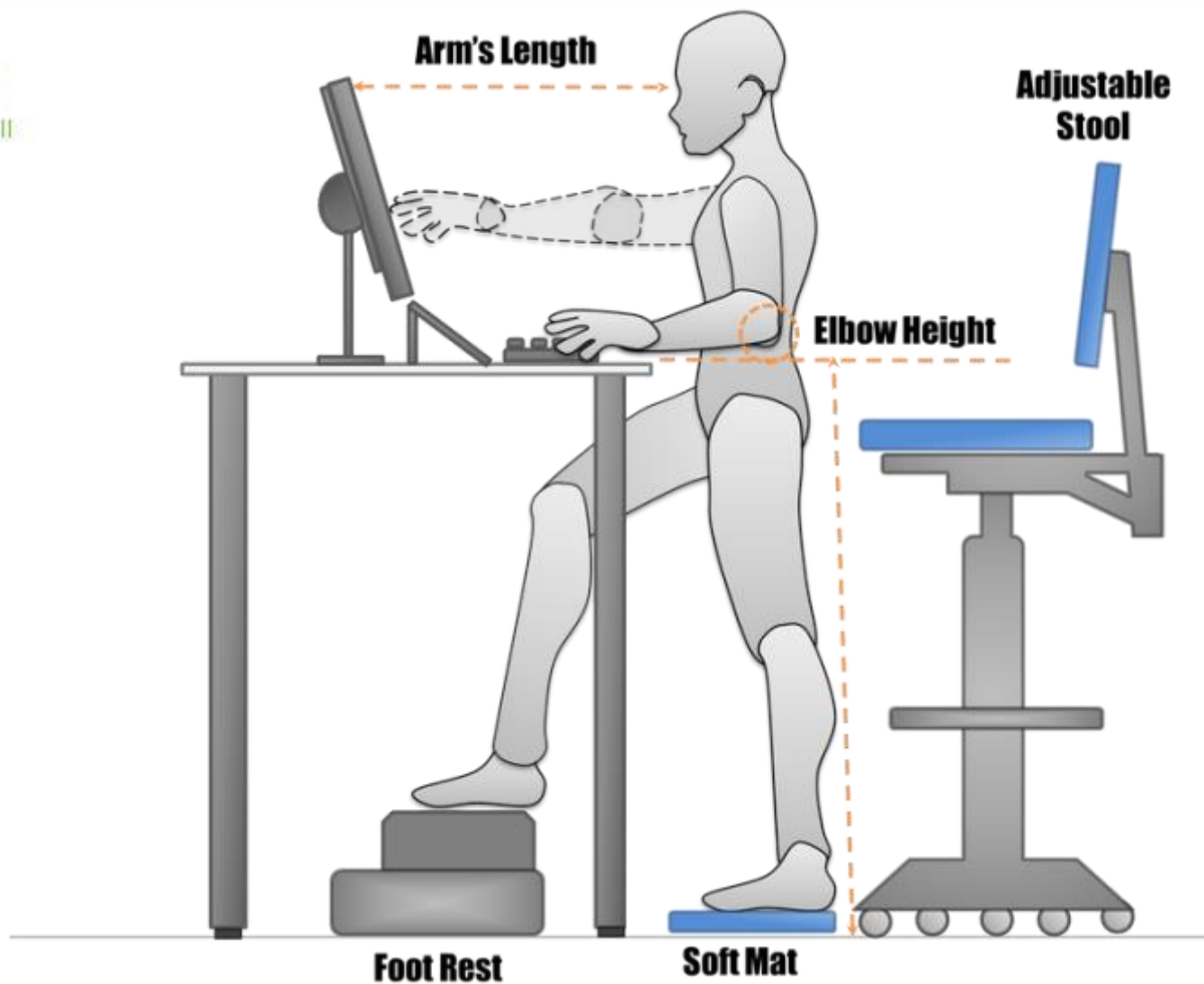


# Sit-Stand Workstations

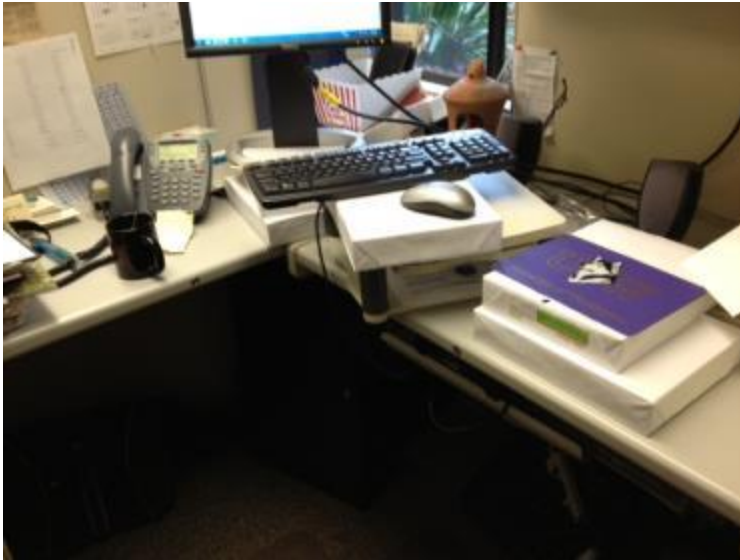


- Many options: electric, crank, pneumatic etc.
- Reduces back strain
- Increase circulation and muscle activity
- May not be a good option for individuals with knee and hip issues





# Modifications



## DXT Fingertip Vertical Wireless Mouse

- Ergonomic Relaxed Neutral Wrist and Hand Position
- Precision Grip for Accurate Navigation
  - Small muscles and joints of the fingers have higher processing abilities
- Instantly Switches Between Right and Left Hand
- [Video](#)

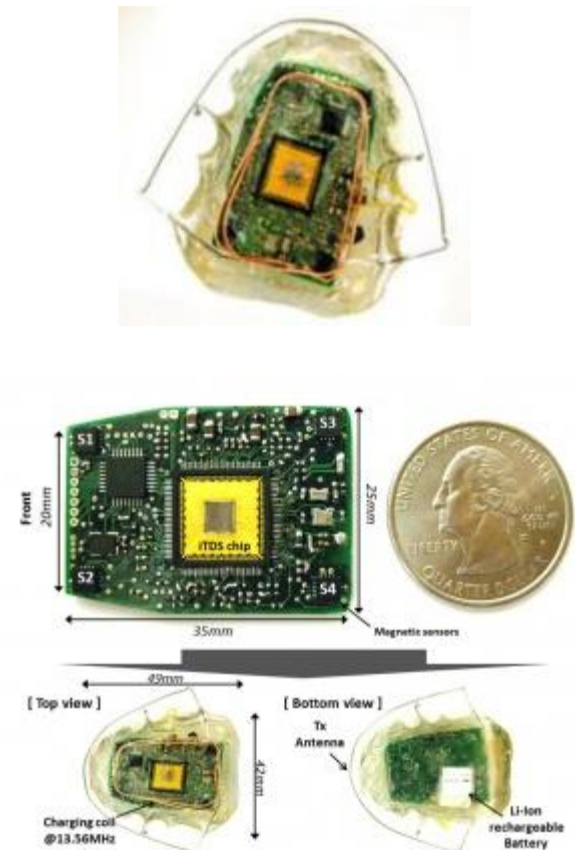




# Tongue Drive System

- Wireless device that enables people with high-level spinal cord injuries to operate a computer and maneuver an electrically powered wheelchair simply by moving their tongues
- dental retainer embedded with sensors
- detect movement of a tiny magnet attached to the tongue
- Testing with iPods and iPhones

- *GA Tech*
- *Shepherd Center and Rehab Institute of Chicago*







## Products / New Products

ASL brings innovative products to our clients! We are here to help each client reach their full potential – our team creates products and designs as a direct result of the needs of those we serve. Our goal has always been independence and equal rights for those we work with....

### Driver Control Packages

100 Series

ASL 138 Extremity Control Joystick



Specialty Products & Adaptors

### Electronic Switches

200 Series

ASL 215 Round Proximity Sensor with Mono Port and 24 Volt Connector



Specialty Products & Adaptors

### Electronic Switches

200 Series

ASL 215 Round Proximity Sensor 3 Pin



Specialty Products & Adaptors

# Keyboards

- Larger keys can increase access for students with visual or motor difficulties
- \$70-\$100



# Keyboards

- Compressed/mini; 77 keys
- Smaller footprint beneficial for one handed users
- \$35-50



# Ergonomics and Writing Solutions

## Writing Solutions:



- “The Penagain takes a novel [ergonomic](http://ergonomics.about.com/od/buyingguide/fr/frpenagain.htm) approach to ink pen design. The body of the pen is shaped like a "Y" creating a cradle for the index finger to rest in.”

<http://ergonomics.about.com/od/buyingguide/fr/frpenagain.htm>



- Wide barrel pens can make it easier for some people to write due to their contoured shape. With a Fat Ergonomic Pen there's more surface area to grip which makes it easier to write.





# Movement Helps Learning!

- 2003 study in *American Journal of Occupational Therapy* concluded that students with ADHD using ball chairs were able to sit still, focus and write more words legibly
- 2007 Mayo Clinic study concluded that a chair-less classroom increased attention and improved learning
- 2008 University of Central Florida study
  - children need to move to focus during a complicated mental task
  - especially those with attention-deficit/hyperactivity disorder (ADHD)—fidgeted more when a task required them to store and process information rather than just hold it.



# Fidget Footrests

- Standing desks can help individuals who find sitting still difficult
- Use of dynamic footrests can help release energy and improve focus





# Mounts and Work Surfaces

- Sit/stand desks
- Tilt Desks
- Portable mounts for devices
- Adjustable monitor arms

# Mounts



RAM



RAM



ErgoMart



(RJ Cooper Magic Arm )

# Gaming...The thumbs have it!



# Mobile devices



- Explore various mounting options to hold mobile devices
- Helps with posture
- Operate wheelchair or other mobility aid safely
- Builds confidence
- Then you can text Carolyn & Maria all the time!

# Mobile devices

- Should be accessible for type of selection process
  - Direct selection with hands
  - Stylus
  - switches
- Use mounts to improve upper extremity and visual access

# Controlling the Environment



# Defining Environmental Control



- An environmental control device is a form of electronic assistive technology which enables people with significant disabilities to independently access equipment in their environment e.g. home, classroom and/or office.
- An environmental control controller is the device that controls the equipment – like a remote control. The controller is used to select a range of different options. Each option will control a piece of equipment in a certain way – for example: volume on a TV.



# Who needs Environmental Control?

- Anyone with complete loss or minimal ability to control devices in their immediate environment (such as the television, computer, phones, lights, doors, etc.).
- Technology that allows a people with disabilities to gain this type of control has been called an environmental control system and/or units (ECS, ECU).



# Types of Environmental Control

1. **Switch** - the user activates an accessible switch to control the environmental control unit, generally done through menu scanning.
  2. **Voice** - the user speaks the commands to the environmental control unit "turn on bedroom light."
  3. **Both**
- ✓ The more options available (switch, voice, and/or both) the more independence can be gained.
  - ✓ **Tip!** Look for the ability to customize or combine the control (input) devices to meet needs. While a voice-activated system can give the most independence, one's voice can become weak by the end of the day, so an ECU that can be controlled by both voice and switch may be very beneficial.

# Amazon Echo

amazon echo

Always ready, connected, and fast. Just ask.



- Speech-controlled speaker system
- Voice recognition - further distances
- All functions are server side
- Compatible with many EC Brands
- \$179.99

# Philips Hue Light Bulbs



- Wifi Connected
- Dimmable
- Displays Over 16 Million Colors
- Compatible with Amazon Echo
- Color Starter Kit \$174.99

# Schlage Z-Wave Keypad Lever



- Works with PIN, Key, or Z Wave
- Compatibility workarounds with Amazon Echo are not complex
- Independently manage security when paired with a security camera
- \$199.99



# Castle OS and Castle Hub

- Chris Ciccitelli has been a fan of Star Trek and was fascinated by the idea of a computer listening to you and taking any action requested. Sometimes it was just retrieving information, other times it controlled different ship functions.
- Chris worked for years creating a system for home automation/control that emulated the computer on Star Trek.
- Castle OS and Castle Hub are able to control all other EC devices regardless of what protocol it uses.
- This system operates using the microphone array in the Kinect camera to listen to you from anywhere in the room.

# Vera and Veralite


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[PRODUCTS](#)
[APPS](#)
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[How It Works](#)

## VeraLite

Smart Home Controller


[Home / Controllers / VeraLite](#)

[Description](#)
[Features & Specs](#)
[Warranty & Support](#)

### YOUR NEW ASSISTANT

HOME CONTROL DOESN'T HAVE TO BE COMPLICATED OR EXPENSIVE, SO WE CAME UP WITH THE VERALITE SMART CONTROLLER, WHICH IS SIMPLE AND INEXPENSIVE. IT MAY BE SMALL, BUT IT'S CAPABLE OF BIG THINGS!

- Easily manages up to 70 devices
- Plug and play with your Internet connection
- Controls over 750 smart products of all kinds
- Custom text and email alerts for any situation



VeraLite gives you easy control over lights, cameras, thermostats, door locks alarm systems and more. Plus you easily can add intelligence to almost anything electronic in your home, and VeraLite can control them too. All the smart home benefits you've been looking for are right here in this easy, inexpensive add-on to your home network.



**AN AMAZING AMOUNT OF SMART TECHNOLOGY THAT FITS IN THE PALM OF YOUR HAND.**

VeraLite gives you easy control over lights, cameras, thermostats, door locks alarm systems and more.

**ONLY \$179.95**

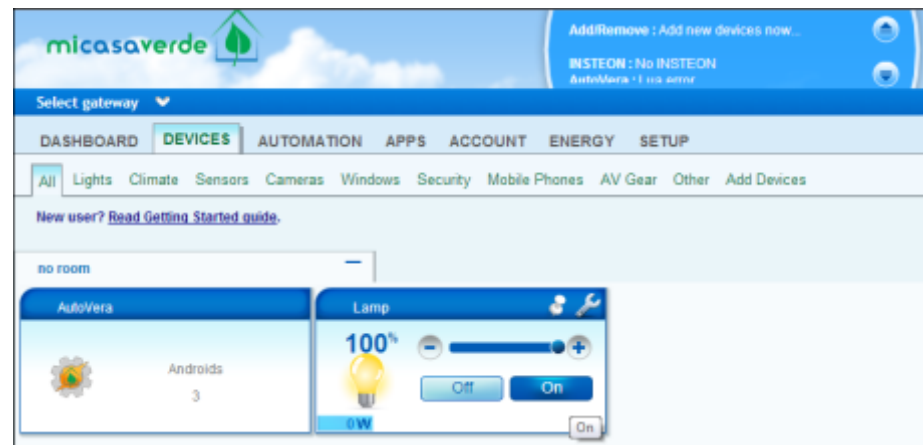
WHAT'S IN THE BOX



# Vera User Interfaces

Vera gateways can be controlled with a number of different interfaces.

- First Party Software
  - PC
  - MAC
  - Smartphone App
- Third Party Software
  - Smartphone Apps
  - TASKER! (Android only)



# Device Automation

Device automation is a type of application that allows you to really unleash your mobile device's capabilities.

In a nutshell, an automation app is a program that tells your device "When this happens, do this!"

- "When something is plugged into the headphone jack, open my music app"
- "When I open the navigation app, turn GPS on"
- "When my phone is connected to this cell tower, turn on wifi and connect to my home wifi"

# Device Automation Apps

- IF by IFTTT
  - If This Then That (IFTTT) is a simple free automation app available on both IOS and Android devices. IF allows you to create recipes easily or to use recipes others have already created.
- Tasker
  - Tasker is a more robust automation app for Android. It costs \$2.99 but offers more ways to trigger your automation and more in depth control of your device.

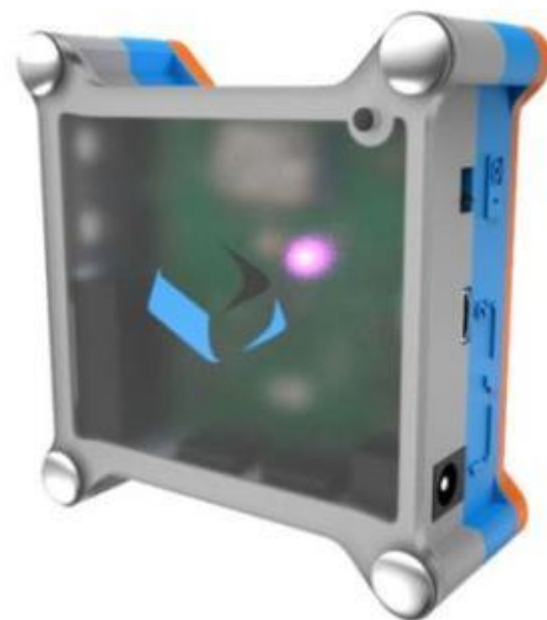
# Fact!

If you can control your computer, you  
can control your environment!

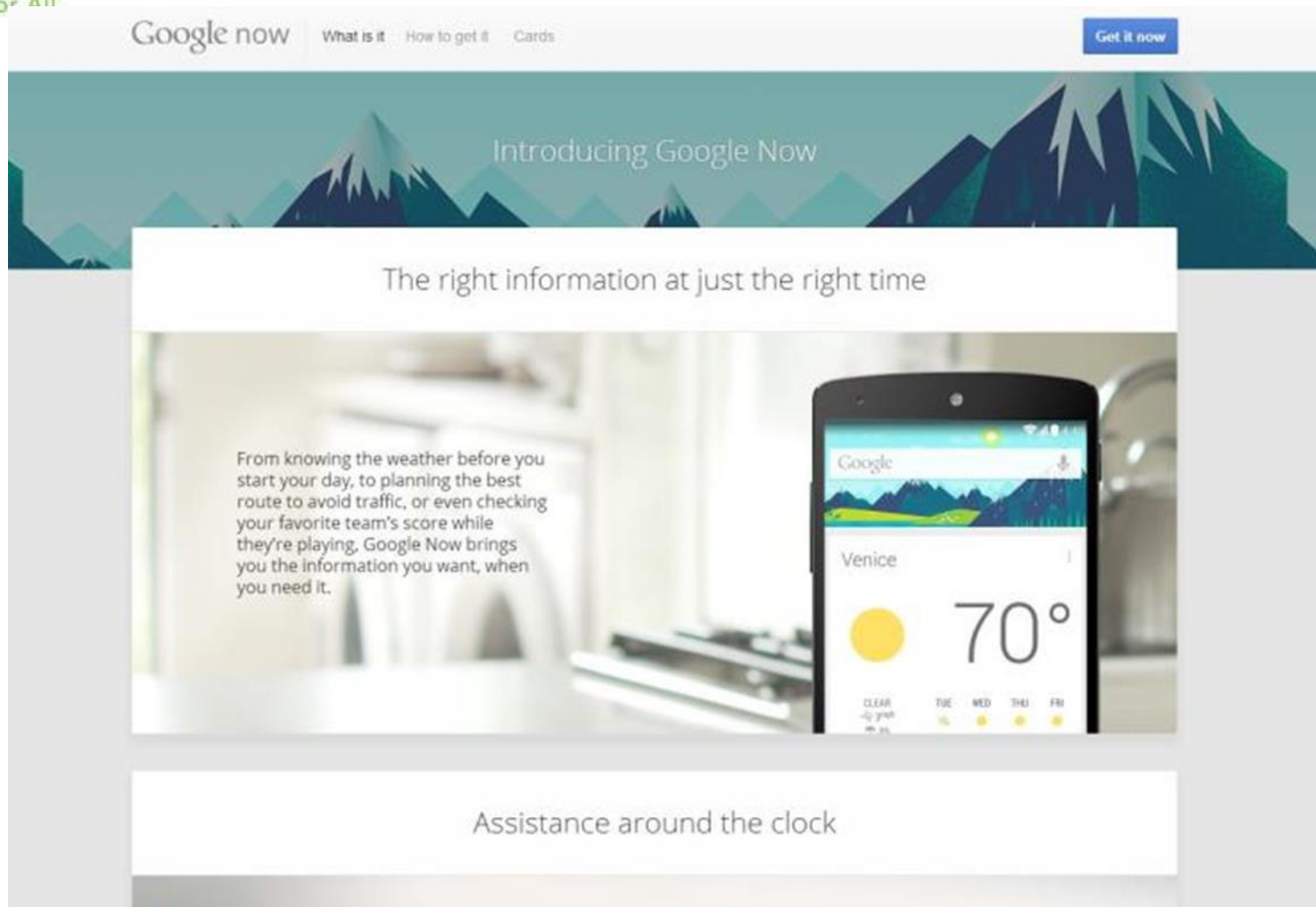


# Tecla Shield

- Wireless device that controls smartphones and tablets using your external switches or the driver controls of your power wheelchair
- The only switch interface that works with both iOS® and Android mobile devices.



# Google Now




Google now | What is it | How to get it | Cards | [Get it now](#)

## Introducing Google Now

The right information at just the right time

From knowing the weather before you start your day, to planning the best route to avoid traffic, or even checking your favorite team's score while they're playing, Google Now brings you the information you want, when you need it.



Venice

70°

CLEAR -43 ymth 40

TUE WED THU FRI

Assistance around the clock

# Telepresence

# VGo Telepresence Robot

- Enables a person to replicate themselves in a distant location and have the freedom to move around as if they were physically there
- Reduces travel costs
- School
- Hospital
- Work from home



## Solutions

- Overview
- Products and Services
- Benefits
- Applications
  - Healthcare
  - Large Enterprise
  - Manufacturing
  - Education
  - SMB

## Quick Links

**Request Info**  
**Drive a VGo**  
**Latest VGo News**  
**Download VGo App**

## People with Disabilities in the Work Place

Sector: **Business**



VGo increases productivity and effectiveness while lowering costs by enabling a person to get to a location instantly and easily. VGo is not designed as a replacement for in-person interaction but rather as the next best alternative to "being" in the workplace. VGo also eliminates the deficiencies associated with other video solutions that are locked to a TV or computer monitor by providing 100% remote controlled mobility. [delete that](#)

In addition to "being" at work from home, VGo can help people who can get to the workplace, but who cannot practically move about the facility or campus. A VGo can be used to enable a person to move around in one part of the facility while they are physically in another.

### The benefits of using VGo in the workplace include

- Getting to places previously inaccessible increases opportunities
- Freedom of movement increases personal interaction with others
- Quality of life improvements by expanding the work and social environments
- Costs can be reduced by lowering or eliminating select transportation expenses, and by communications and speeding decision making



# Kubi



- Dock your tablet for remote pan and tilt controls
- See and interact with people during a conference call
- Use any Video Client: Skype, FaceTime, Google Hangout, etc.
- Cloud Control



# Beam



## **Solutions: Enhance the Ability to Focus**

# BackTpack

- Ergonomically redistributes the weight of carried loads between two compartments
- Hip-loading belt
- Magnetic closures
- Easy access to items
- Sit strap
- Lightweight/water resistant nylon



<http://www.bapingroup.com/>; \$63 to \$100

# **Solutions: Reduce Fatigue and Save Energy**

# Vision

- Magnify written material using hand/stand/optical magnifiers
- Larger monitors
- Adjustable monitor holders may be beneficial
- Provide large print material or text to speech software
- Glare screen to the computer
- Proper office lighting
- Allow frequent rest breaks

# Fatigue



- Reduce or eliminate physical exertion and workplace stress
- Implement ergonomic workstation design
  - Design workstation to reduce reaches
  - Easy access to frequently used tools and equipment
- Schedule periodic rest breaks away from the workstation
- Allow a flexible work schedule and flexible use of leave time
- Provide a scooter or other mobility aid if walking cannot be reduced (consult with PT)



# Heat Sensitivity

- Use cool vest or other cooling clothing
- Use fan/air-conditioner at the workstation
- Allow flexible scheduling and flexible use of leave time

## **Solutions: Productivity at Work**

# TFL AppFinder

**Search by:**

✓ **App Name**

✓ **Categories**

- Book
- Education
- Environmental Adaptations
- Hearing
- Cognition, Learning, Developmental
- Navigation
- Personal Care and Safety
- Productivity
- Communication
- Therapeutic Aids
- Vision



# SkyGrid



- Personalize news events by categories
- Simple interface
- Free
- [www.skygrid.com](http://www.skygrid.com)



# Dragon for iOS & Android

## Dragon & Dragon Mobile Assistant

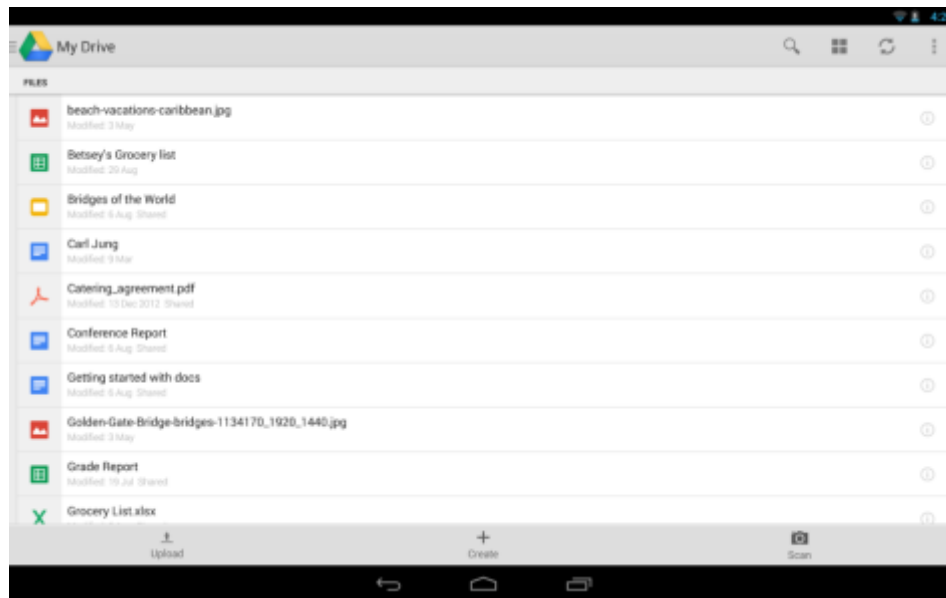
- Speak to send a text, email, or call
- Set reminders
- Search the Internet
- Program to listen only to your voice
- Free

## Swype

- Alternate Keyboard
- Draw from one letter to the other without lifting a finger
- Reduces finger movement/fatigue



# Google Drive



- Upload photos, videos, documents, and other files and access wherever you go
- Share photos and files
- Make files available off-line
- Scan documents with device camera
- Up to 15 GB of storage
- Free



# Remote Mouse

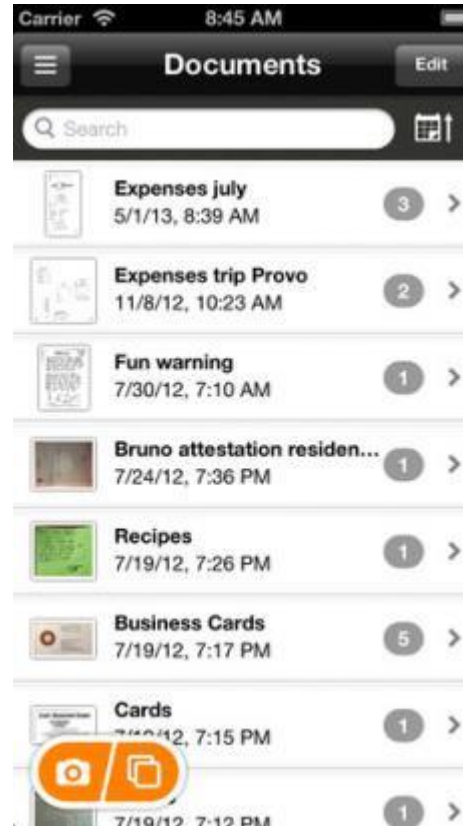
- Turns your mobile phone or tablet into a wireless remote control for your computer
- Fully simulated mouse
- Magic trackpad
- Multi touch Gestures
- Landscape mode



# Genius Scan



- Scan documents or handwritten notes
- Email the scans as JPEG or PDF
- Free
- Genius Scan Plus (\$2.99) allows upload to Dropbox, Skydrive or Evernote



# Perfect OCR



- \$3.99
- Uses the built in camera to scan documents
- Edit, copy, store, email documents
- Upload to online storage is as Evernote
- Does take practice for picture



# Wunderlist

- List management
- Create recurring to-dos
- Create subtasks
- Set due dates
- Reminders
- Notifications
- Cloud sync
- Email directly
- Collaborate with anyone
- Access on all devices including web
- <https://www.wunderlist.com/en/>



# Reminders



- Built-in App
- Works with VoiceOver
- Organize your reminders
- Siri if have iPhone 4s or 5
- The new iPad

# Sleep Cycle



- Tracks your sleep patterns
- Uses iPhone accelerometer to track how often you move at night
- Set an alarm range
- Woken up gradually when you are in like sleep
- Feel refreshed and energized
- \$2.99



# iZen Garden



- Choose from 100s of objects, plants and creatures to place in your garden
- Rake the sand and share your creations
- Helps you to center your mind, relax your psyche and relieve your stress

# Breathe2Relax



- Portable stress management tool
- Detailed information on the effects of stress on the body
- Instructions and practice exercises to learn the stress management skill called diaphragmatic breathing



# Preparation for the Future

- Compliance & Progress
  - Proper positioning will become habit and will provide comfort that will help to shape compliance over the years.
- Save Energy
  - Muscles have to work extra hard just to hold you up if you have poor posture, leaving you without energy.
  - Work smarter, not harder!

# Preparation for the Future

- Ready for the Workplace
  - All of the solutions, helpful tools and strategies that I learned over the years are helping me to be successful today!
  - Let your environment work for you!



# References

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- <http://repetitive-stress-injury.blogspot.com/2012/07/we-discussed-office-ergonomics-in-last.html>
- <http://www.especialneeds.com/classroom-furniture-classroom-tables-chairs-adaptive-tables-chairs-jettstep-footrest.html>
- <http://pinterest.com/parko/positioning/>
- <http://www.therapro.com/Study-Pal-P4197C4192.aspx>
- [www.ergomart.com](http://www.ergomart.com)
- <http://ajot.aotapress.net/content/57/5/534.abstract>
- <http://www.time.com/time/magazine/article/0,9171,1889178,00.html>
- <http://www.desktopdesk.com/purchase.html>



**Our Question to You:  
What have You Learned today?**



# TOOLS *for* LIFE

Georgia's Assistive Technology Act Program

thank  
you





# The Team



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