Occupational Health Clinics for Ontario Workers Inc.

Centres de santé des travailleurs (ses) de l'Ontario Inc.

RSI Day 2023

Introduction to Job Demands Analysis (JDA) in Beta

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OHCOW Sarina Office

Presentation overview

- Explain need for capturing cognitive and psychosocial demands
- Process of visualization and creation of our JDA tool
- Introduction to Job Demands Analysis (JDA)

Why Assess Cognitive and Psychosocial Demands?

- "Associations between physical or psychosocial risk factors and work-related musculoskeletal disorders in construction workers based on literature in the last 20 years: A systematic review" (Anwer et al., 2021)
- "A systematic overview on the risk effects of psychosocial work characteristics on musculoskeletal disorders, absenteeism, and workplace accidents" (Taibi et al., 2021)
- "Work-related psychosocial risk factors and musculoskeletal disorders in hospital nurses and nursing aides: A systematic review and meta-analysis" (Bernal et al., 2015)
- "The impact of work-related psychosocial stressors on the onset of musculoskeletal disorders in specific body regions: A review and meta-analysis of 54 longitudinal studies" (Hauke et al., 2011)

There is extensive research that shows how cognitive and psychosocial demands in the workplace contribute to the development of MSDs

How is PDD information used?

- Adjudication of claims (by the WSIB in Ontario)
- Accommodation of a worker
- Educate treating healthcare practitioners
- Inform prevention efforts

Including cognitive and psychosocial demands paints a whole picture

Intro to Job Demands Analysis (JDA)

A Physical Demands Description (PDD) is a detailed, objective description of the physical demands required to complete the essential and non-essential tasks of a job.

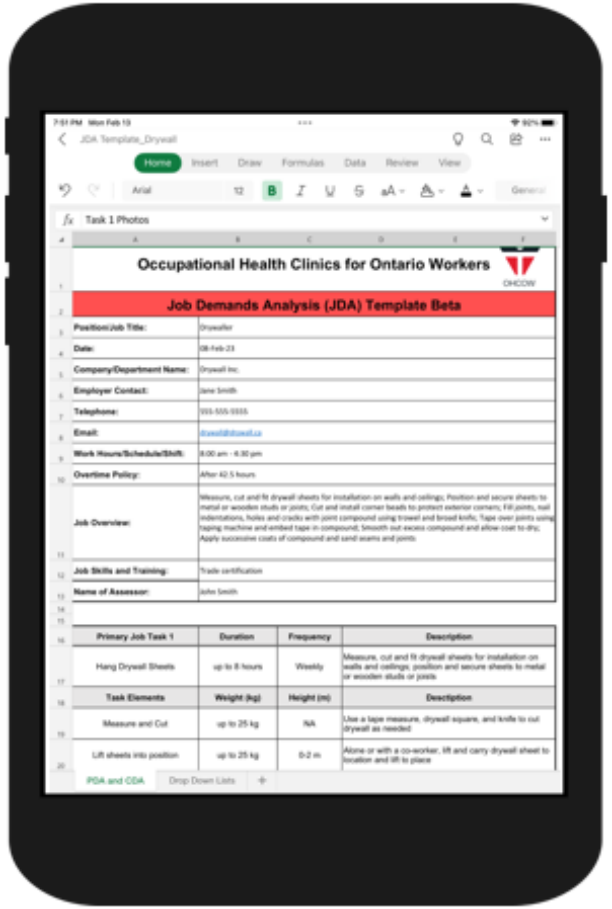
A Cognitive Demands Analysis (CDA) is a detailed, objective evaluation of the specific cognitive, emotional, and psychological skills required to perform essential and non-essential tasks of a job.

Job Demands Analysis - A Job Demands Analysis (JDA) includes both a physical demands description as well as a cognitive (mental) demands analysis. A JDA aims to systematically quantify and evaluate the physical, cognitive (mental), and environmental demands of a task or job (CCOHS, 2022).

Source: https://www.ccohs.ca/oshanswers/psychosocial/rtw_jobdemands.html

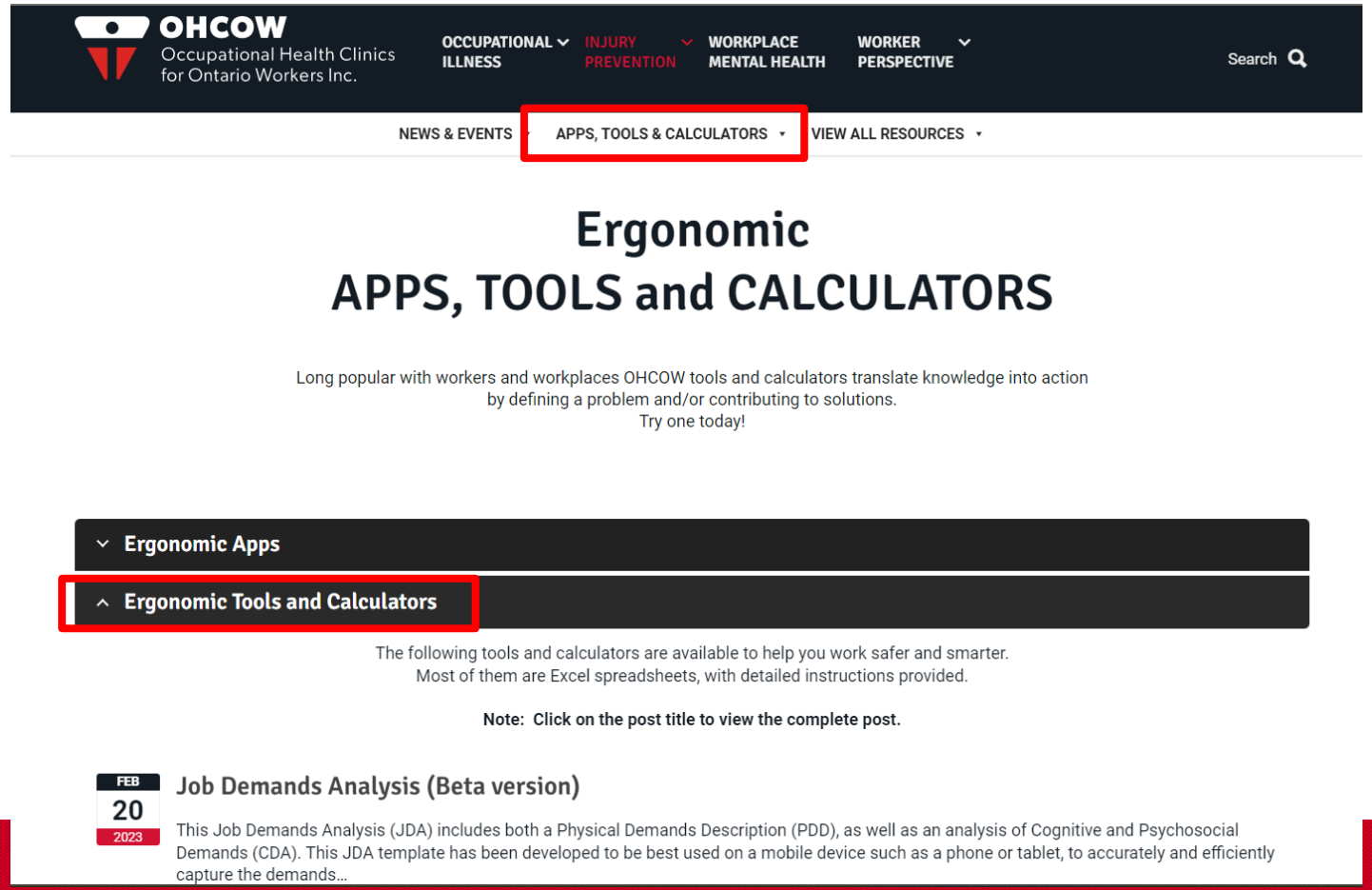
Visualization and Creation of JDA format

- Initiated from necessity
- Reviewed “An improved physical demand analysis framework based on ergonomic risk assessment tools for the manufacturing industry” by Li et al., (2019).
- Designed to be used best with mobile phones or tablets
- Spreadsheet has been used to increase accessibility

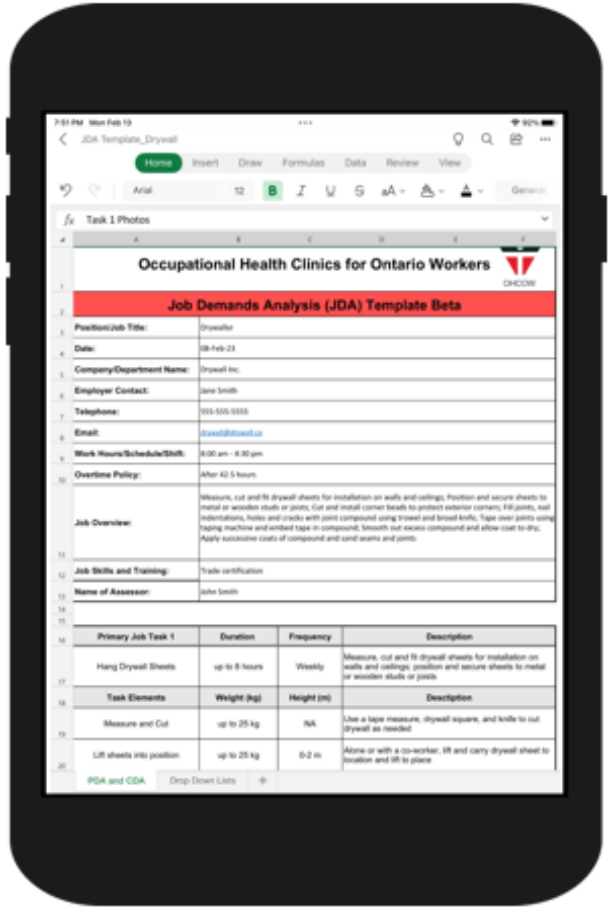


Introduction to JDA Tool

https://www.ohcow.on.ca/posts/job-demands-analysis-beta-version/



Overview Page



Occupational Health Clinics for Ontario Workers

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Beta Job Demands Analysis (JDA) Template

Position/Job Title:	
Date:	
Company/Department Name:	
Employer Contact:	
Telephone:	
Email:	
Work Hours/Schedule/Shift:	
Overtime Policy:	
Job Overview:	
Job Skills and Training:	
Name of Assessor:	

Primary Job Task 1	Duration	Frequency	Description		
Task Elements	(Select Measure)	(Select Measure)	(Select Measure)	(Select Measure)	(Select Measure)
Element Description:					
Element Description					
Element Description:					

PDA and CDA | Drop Down Lists

Primary Job Tasks

Primary Job Task 1	Duration	Frequency	Description		
Hang Drywall Sheets	up to 8 hours	up to 5 days/week	Measure, cut and fit drywall sheets for installation on walls and ceilings; position and secure sheets to metal or wooden studs or joists		
Task Elements	**Weight (kg)**	**Height (m)**	**Force (kg)**	**Distance (m)**	**Time (min)**
Measure and Cut	10	1.5	10	<10	60-120
Element Description:	Use a tape measure, drywall square, and knife to cut drywall as needed				
Lift drywall sheet to position	25	1.8	25	<10	60-120
Element Description	Alone or with a co-worker, lift and carry drywall sheet to location and lift to place				
Secure sheet to studs	<3	0-2	<2	na	60-120
Element Description:	Use a tape measure, drywall square, and knife to cut drywall as needed				
Element Description:					
Element Description:					

Task 1 Photos

Selecting Demand Categories

fx Task 2 Photos

	A	B	C	D	E	F
22						
23						

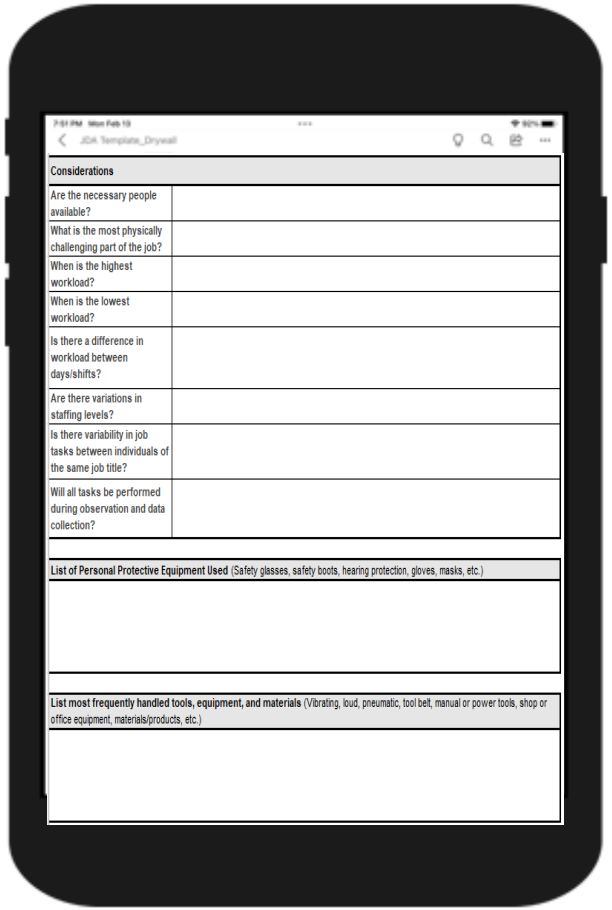

Task 1 Photos


Primary Job Task 2	Duration	Frequency	Description
Mudding and taping	up to 8 hours	weekly	Fill joints, screw indentations, and joints/crask with compound using trowel, tape joints, remove excess and allow coat to dry

Task Elements	Weight (kg)	Height (m)	Description
Mix drywall compound	up to 25	0-2	Handle bags of buckets of compound to pour and mix with water using a drill and mixer
Apply compound to needed areas using trowel	3	0-3	Use trowel to apply compound over screw heads, joints, etc.
Apply tape over mudded joints	2	0-4	Apply paper or mesh tape over mudded joints and remove excess mud with trowel
Apply additional compound coats	3	0-2	Once dried compound is sanded (following task 3), apply additional coats as needed
Clean equipment	2	na	Use water and cloth to wash equipment before mud dries

Task 2 Photos

Considerations



Considerations	
Are the necessary people available?	
What is the most physically challenging part of the job?	
When is the highest workload?	
When is the lowest workload?	
Is there a difference in workload between days/shifts?	
Are there variations in staffing levels?	
Is there variability in job tasks between individuals of the same job title?	
Will all tasks be performed during observation and data collection?	

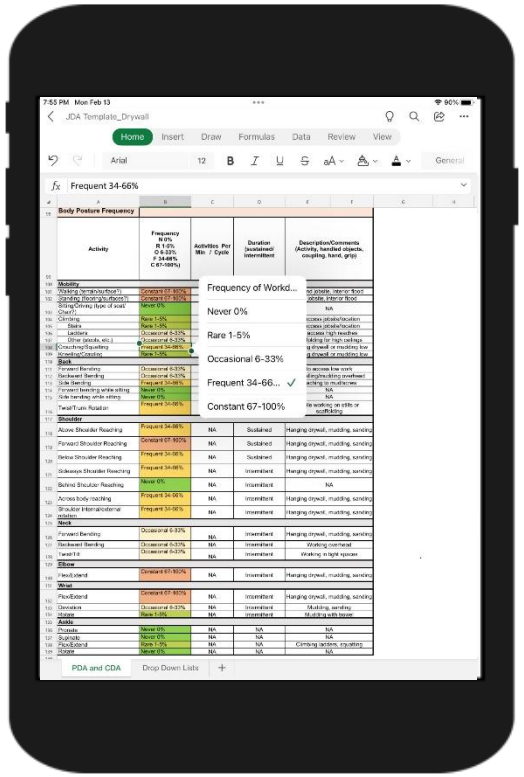
List of Personal Protective Equipment Used (Safety glasses, safety boots, hearing protection, gloves, masks, etc.)

List most frequently handled tools, equipment, and materials (Vibrating, loud, pneumatic, tool belt, manual or power tools, shop or office equipment, materials/products, etc.)

Strength Demands of Job

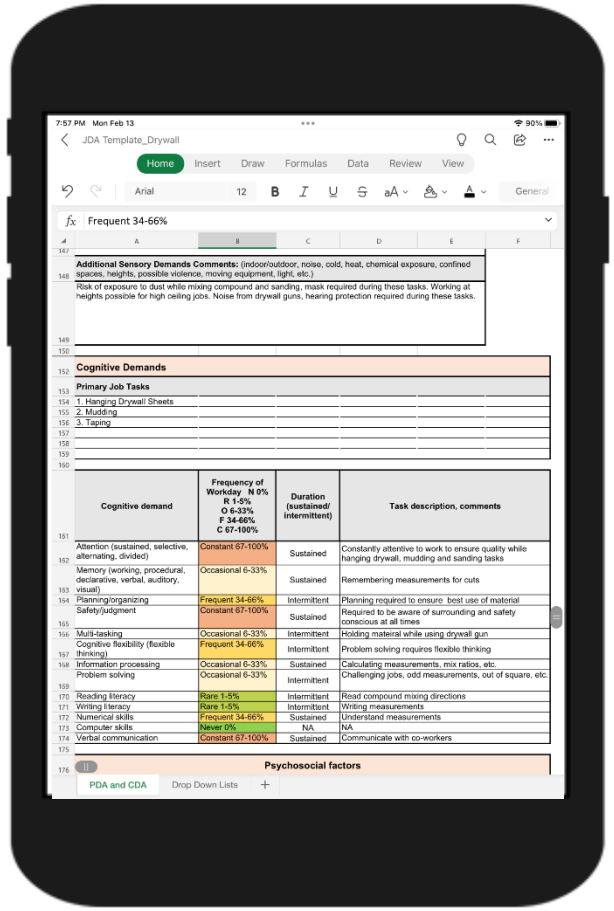
Strength Demands of Job									
Activity	Force Load Avg (kg)	Force/ Load Max (kg)	Frequency N 0% R 1-5% O 6-33% F 34-66% C 67-100%)	Efforts Per Min or Cycle	Duration (Sustained/ intermittent)	Height (m)	Moving Distance (m)	Comments (Description of handled objects, coupling, hand, grip)	Borg Scale (Rating of perceived exertion)
Lifting									
Low Level Lifting	5	35	Occasional 6-33%	NA	Intermittent	0-0.5	up to 10	lift drywall, tools, materials	4
Waist Level Lifting	15	35	Frequent 34-66%	NA	Intermittent	0.6-1.2	up to 10	lift drywall, tools, materials	5
Above Shoulder Lifting	3	18	Occasional 6-33%	NA	Intermittent	na	up to 10	lift drywall, tools, materials	7
Carrying									
Front Carry	3	10	Frequent 34-66%	NA	Intermittent	~1.3	up to 10	carry drywall, tools, materials	6
Side Carry (Right Hand)	2	10	Occasional 6-33%	NA	Intermittent	~1.3	up to 10	carry drywall, tools, materials	8
Side Carry (Left Hand)	2	10	Rare 1-5%	NA	Intermittent	~1.3	up to 10	carry drywall, tools, materials	6
On Shoulder	6	8	Rare 1-5%	NA	Intermittent	na	up to 10	carry drywall, tools, materials	4
Pushing/Pulling									
Pushing (tools, objects, etc.)	1.5	40	Rare 1-5%	NA	Intermittent	1.2-1.4	<0.5	Pushing on drill, pushing drywall into position	4
Pulling (tools, objects, etc.)	1.5	40	Rare 1-5%	NA	Intermittent			Pushing on drill, pushing drywall into position	4
Grasping and Pinching									
Left hand use	0.1	10	Constant 67-100%	NA	Sustained	NA	NA	handling tools and materials	3
Right hand Use	0.1	10	Constant 67-100%	NA	Sustained	NA	NA	handling tools and materials	5
Forceful Gripping (Right Hand)	3	12	Frequent 34-66%	NA	Intermittent	NA	NA	handling tools and materials	7
Forceful Gripping (Left Hand)	3	12	Occasional 6-33%	NA	Intermittent	NA	NA	handling tools and materials	6
Manual Dexterity	na	na	Frequent 34-66%	NA	Intermittent	NA	NA	handling tools and materials	2
Finger Dexterity	na	na	Occasional 6-33%	NA	Intermittent	NA	NA	handling tools and materials	2

Body Posture Frequency



Body Posture Frequency				
Activity	Frequency N 0% R 1-5% O 6-33% F 34-66% C 67-100%)	Activities Per Min / Cycle	Duration (sustained/ intermittent	Description/Comments (Activity, handled objects, coupling, hand, grip)
Mobility				
Walking (terrain/surface?)	Constant 67-100%	NA	Sustained	around jobsite, interior flood
Standing (flooring/surfaces?)	Constant 67-100%	NA	Sustained	at jobsite, interior flood
Sitting/Driving (type of seat/Chair?)	Never 0%	NA	NA	NA
Climbing	Rare 1-5%	NA	Intermittent	to access jobsite/location
Stairs	Rare 1-5%	NA	Intermittent	to access jobsite/location
Ladders	Occasional 6-33%	NA	Intermittent	to access high reaches
Other (stools, etc.)	Occasional 6-33%	NA	Intermittent	scaffolding for high ceilings
Crouching/Squatting	Frequent 34-66%	NA	Intermittent	hanging drywall or mudding low
Kneeling/Crawling	Rare 1-5%	NA	Intermittent	hanging drywall or mudding low
Back				
Forward Bending	Occasional 6-33%	NA	Intermittent	to access low work
Backward Bending	Occasional 6-33%	NA	Intermittent	drywalling/mudding overhead
Side Bending	Frequent 34-66%	NA	Intermittent	reaching to mud/screw
Forward bending while sitting	Never 0%	NA	NA	NA
Side bending while sitting	Never 0%	NA	NA	NA
Twist/Trunk Rotation	Frequent 34-66%	NA	Intermittent	while working on stilts or scaffolding
Shoulder				
Above Shoulder Reaching	Frequent 34-66%	NA	Sustained	Hanging drywall, mudding, sanding
Forward Shoulder Reaching	Constant 67-100%	NA	Sustained	Hanging drywall, mudding, sanding
Below Shoulder Reaching	Frequent 34-66%	NA	Sustained	Hanging drywall, mudding, sanding
Sideways Shoulder Reaching	Frequent 34-66%	NA	Intermittent	Hanging drywall, mudding, sanding
Behind Shoulder Reaching	Never 0%	NA	Intermittent	NA
Across body reaching	Frequent 34-66%	NA	Intermittent	Hanging drywall, mudding, sanding
Shoulder internal/external rotation	Frequent 34-66%	NA	Intermittent	Hanging drywall, mudding, sanding
Neck				
Forward Bending	Occasional 6-33%	NA	Intermittent	Hanging drywall, mudding, sanding
Backward Bending	Occasional 6-33%	NA	Intermittent	Working overhead
Twist/Tilt	Occasional 6-33%	NA	Intermittent	Working in tight spaces
Elbow				
Flex/Extend	Constant 67-100%	NA	Intermittent	Hanging drywall, mudding, sanding

Cognitive Demands



Additional Sensory Demands Comments: (indoor/outdoor, noise, cold, heat, chemical exposure, confined spaces, heights, possible violence, moving equipment, light, etc.)

Risk of exposure to dust while mixing compound and sanding, mask required during these tasks. Working at heights possible for high ceiling jobs. Noise from drywall guns, hearing protection required during these tasks.

Cognitive Demands

Primary Job Tasks

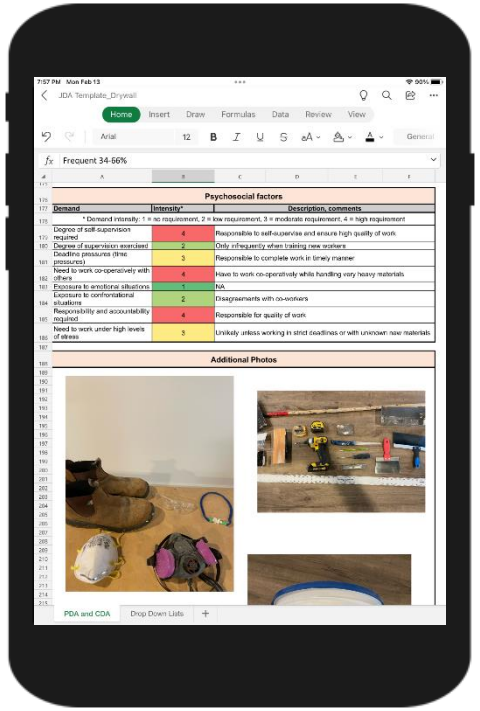
1. Hanging Drywall Sheets
2. Mudding
3. Taping

Cognitive demand	Frequency of Workday N 0% R 1-5% O 6-33% F 34-66% C 67-100%	Duration (sustained/ intermittent)	Task description, comments
Attention (sustained, selective, alternating, divided)	Constant 67-100%	Sustained	Constantly attentive to work to ensure quality while hanging drywall, mudding and sanding tasks
Memory (working, procedural, declarative, verbal, auditory, visual)	Occasional 6-33%	Sustained	Remembering measurements for cuts
Planning/organizing	Frequent 34-66%	Intermittent	Planning required to ensure best use of material
Safety/judgment	Constant 67-100%	Sustained	Required to be aware of surrounding and safety conscious at all times
Multi-tasking	Occasional 6-33%	Intermittent	Holding mateiral while using drywall gun
Cognitive flexibility (flexible thinking)	Frequent 34-66%	Intermittent	Problem solving requires flexible thinking
Information processing	Occasional 6-33%	Sustained	Calculating measurements, mix ratios, etc.
Problem solving	Occasional 6-33%	Intermittent	Challenging jobs, odd measurements, out of square, etc.
Reading literacy	Rare 1-5%	Intermittent	Read compound mixing directions
Writing literacy	Rare 1-5%	Intermittent	Writing measurements
Numerical skills	Frequent 34-66%	Sustained	Understand measurements
Computer skills	Never 0%	NA	NA
Verbal communication	Constant 67-100%	Sustained	Communicate with co-workers

Psychosocial factors

PDA and CDA | Drop Down Lists

Psychosocial Factors & Additional Photos



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JDA Template_Drywall

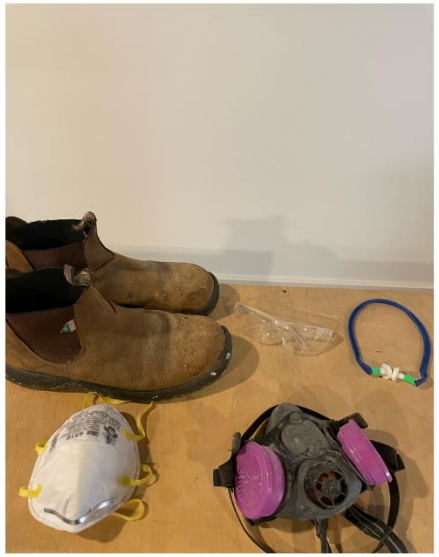
Home Insert Draw Formulas Data Review View

Arial 12 General

Frequent 34-66%

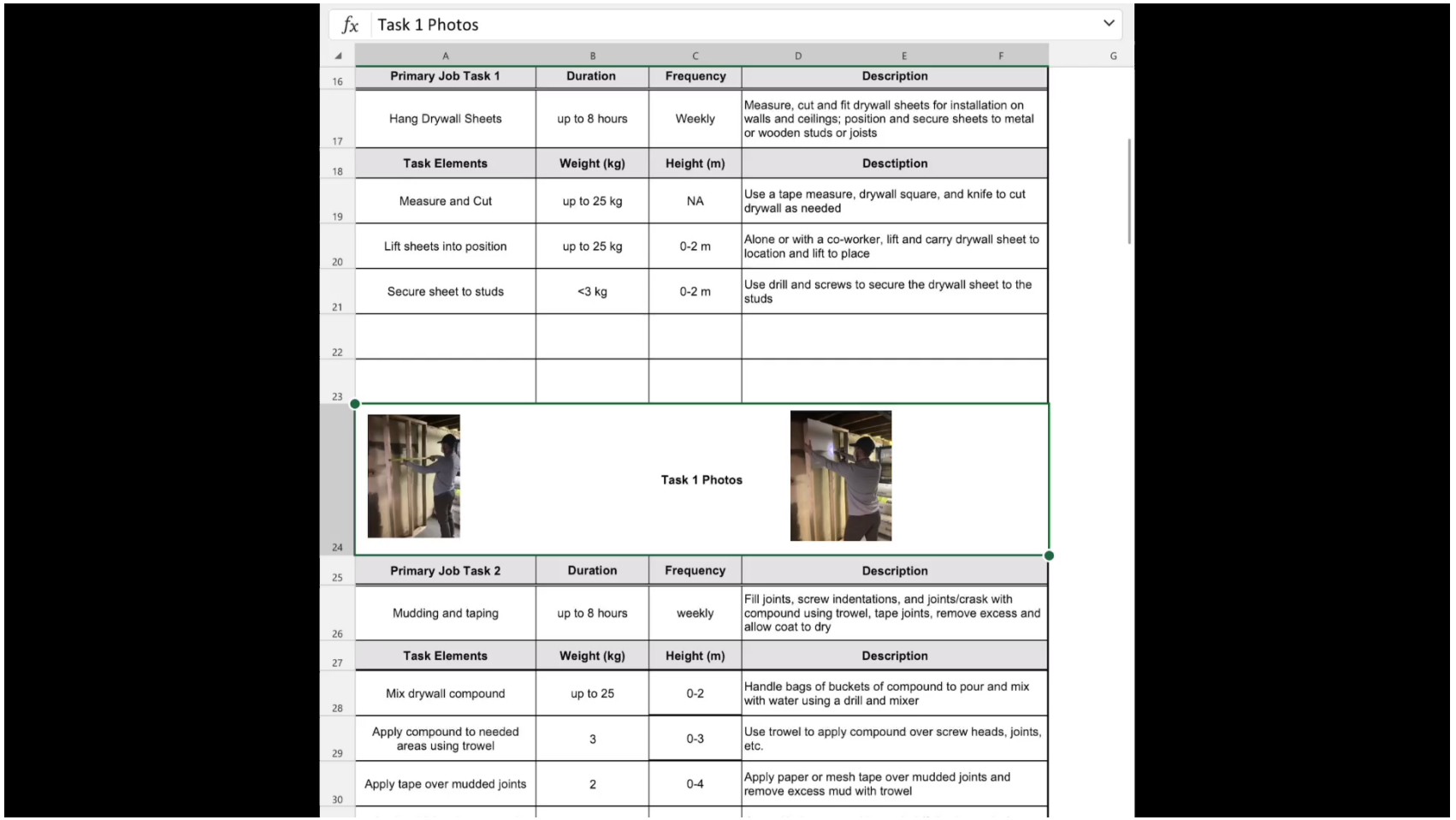
Psychosocial factors		
Demand	**Intensity***	**Description, comments**
* Demand intensity: 1 = no requirement, 2 = low requirement, 3 = moderate requirement, 4 = high requirement		
Degree of self-supervision required	4	Responsible to self-supervise and ensure high quality of work
Degree of supervision exercised	2	Only infrequently when training new workers
Deadline pressures (time pressures)	3	Responsible to complete work in timely manner
Need to work co-operatively with others	4	Have to work co-operatively while handling very heavy materials
Exposure to emotional situations	1	NA
Exposure to confrontational situations	2	Disagreements with co-workers
Responsibility and accountability required	4	Responsible for quality of work
Need to work under high levels of stress	3	Unlikely unless working in strict deadlines or with unknown new materials

Additional Photos



PDA and CDA | Drop Down Lists | +

Add a Saved Photo



Primary Job Task 1	Duration	Frequency	Description
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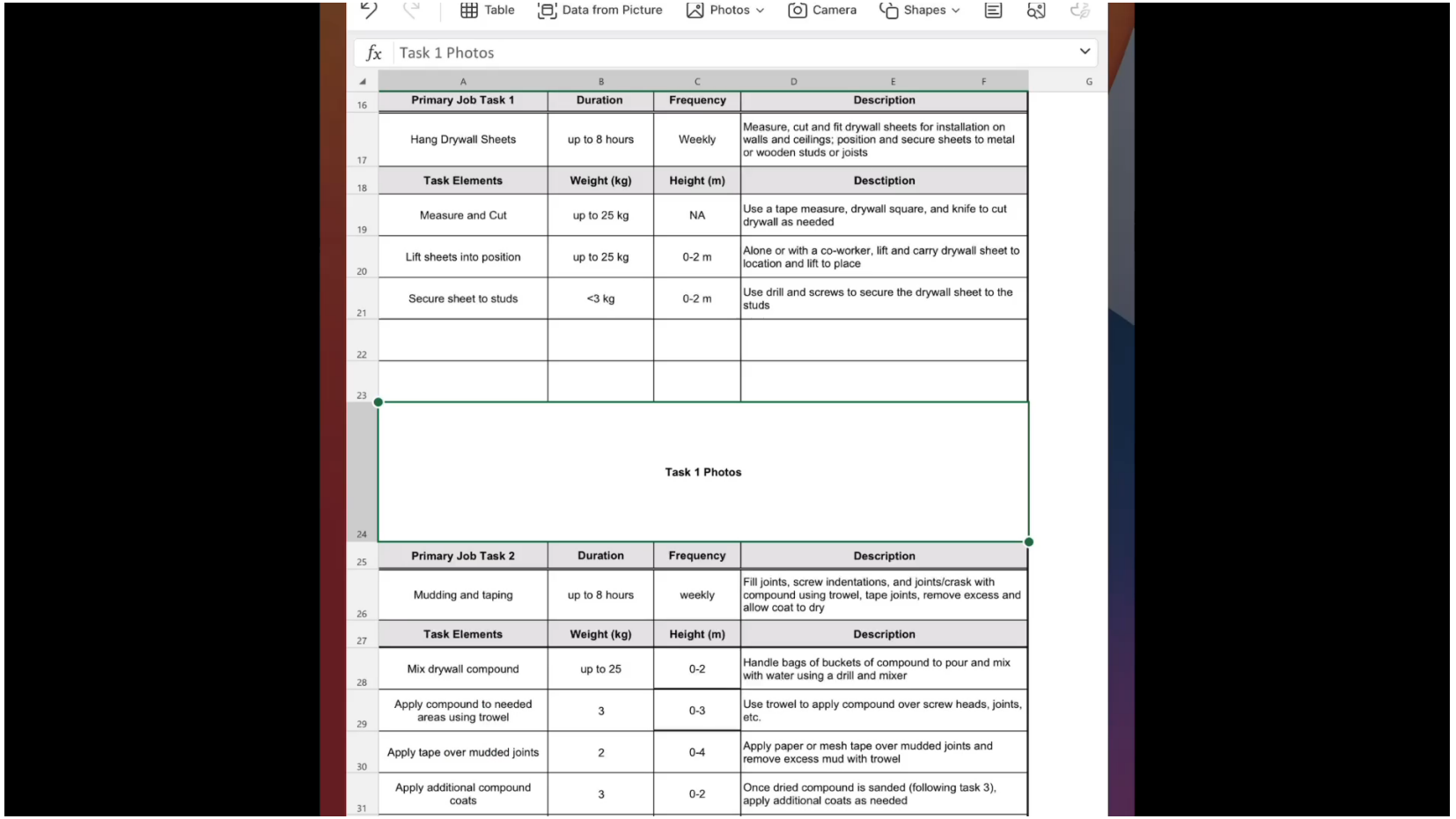
Task Elements	**Weight (kg)**	**Height (m)**	**Desctiption**
Measure and Cut	up to 25 kg	NA	Use a tape measure, drywall square, and knife to cut drywall as needed
Lift sheets into position	up to 25 kg	0-2 m	Alone or with a co-worker, lift and carry drywall sheet to location and lift to place
Secure sheet to studs	<3 kg	0-2 m	Use drill and screws to secure the drywall sheet to the studs

Primary Job Task 2	Duration	Frequency	Description
Mudding and taping	up to 8 hours	weekly	Fill joints, screw indentations, and joints/crask with compound using trowel, tape joints, remove excess and allow coat to dry
Task Elements	**Weight (kg)**	**Height (m)**	**Description**
Mix drywall compound	up to 25	0-2	Handle bags of buckets of compound to pour and mix with water using a drill and mixer
Apply compound to needed areas using trowel	3	0-3	Use trowel to apply compound over screw heads, joints, etc.
Apply tape over mudded joints	2	0-4	Apply paper or mesh tape over mudded joints and remove excess mud with trowel

Add a Live Capture Photo



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Apply tape over mudded joints	2	0-4	Apply paper or mesh tape over mudded joints and remove excess mud with trowel
Apply additional compound coats	3	0-2	Once dried compound is sanded (following task 3), apply additional coats as needed

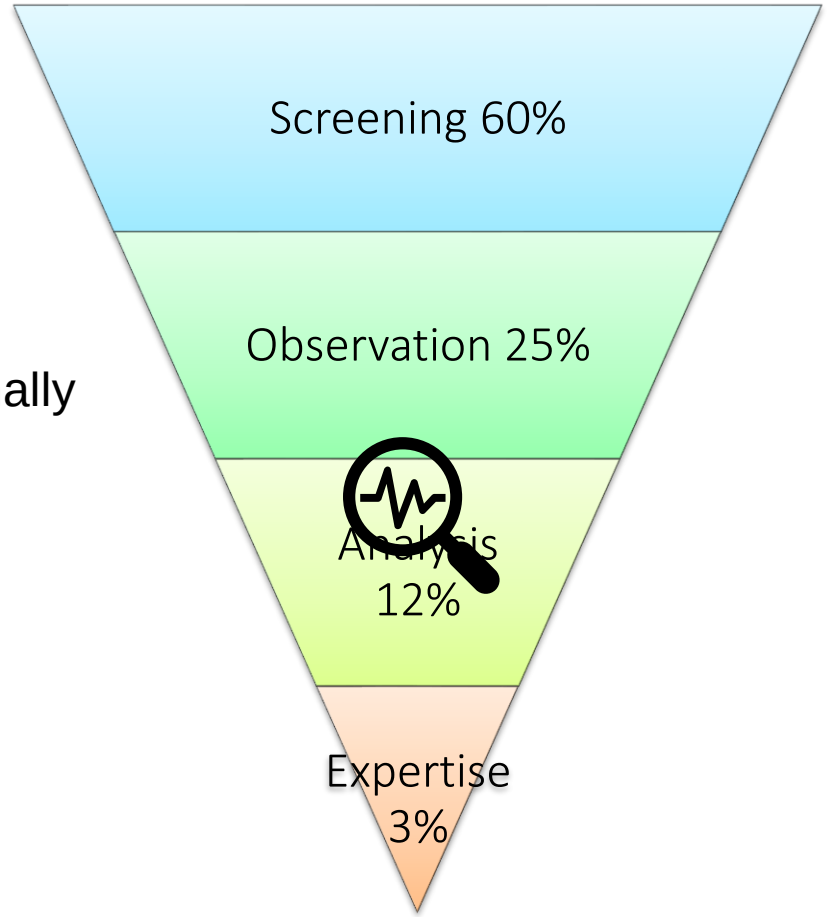
SOBANE:
Levels of Hazard Identification

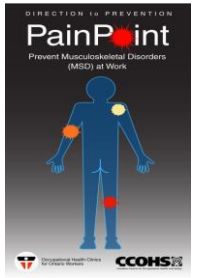
Screening: is when **workers** identify hazards based on their first-hand experience

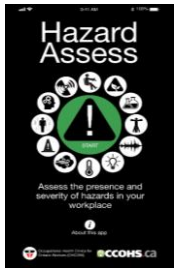
OBservation: is qualitatively organized investigations using checklists, can be done by **JHSC**

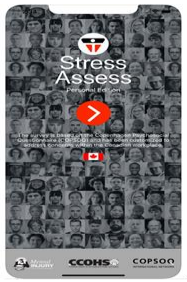
ANalysis: is the quantitative evaluation traditionally associated with H&S professionals, internal OH practitioners (safety officers, occupational physicians, industrial hygienists, ergonomists)

Expertise: is the outside help that is needed to solve a particularly difficult problem, outside OH practitioners/experts.









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Future Direction

- JDA released in “Beta” with additional features on the way
- A user guide for the JDA tool is in process
- The PDD handbook and tool is still available
- We want to hear from you! (aflanagan@ohcow.on.ca)

References

Anwer, S., Li, H., Antwi-Afari, M. F., & Wong, A. Y. L. (2021). Associations between physical or psychosocial risk factors and work-related musculoskeletal disorders in construction workers based on literature in the last 20 years: A systematic review. *International Journal of Industrial Ergonomics*, *83*, 103113.

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Taibi, Y., Metzler, Y. A., Bellingrath, S., & Müller, A. (2021). A systematic overview on the risk effects of psychosocial work characteristics on musculoskeletal disorders, absenteeism, and workplace accidents. *Applied ergonomics*, *95*, 103434.

Thank You

If you have any questions about this presentation, please contact me at the email below

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Or visit the OHCOW website @ www.ohcow.on.ca