

CASE STUDY - Cleaning by hand (detail work)

TASK TITLE: Cleaning by hand (detail work)

Task Description:	<p>There are many different types of cleaning by hand (detail work). Cleaning by hand involves the use of precise hand tools (e.g., picks, small files) to remove bits and pieces of foreign objects. Task duration is dependent on the complexity.</p> <p>Typical jobs in which cleaning by hand (detail work) is performed include:</p> <ul style="list-style-type: none">• dental work• cleaning of technical equipment (building masks, microscopes). <p>Cleaning by hand (detail work) may be performed on flat, angled, and upright surfaces, directly on equipment or in confined spaces.</p>
Job Performance Measures Most Often Impacted by Cleaning by Hand (Detail Work):	<ul style="list-style-type: none">• Quality of the cleaning (e.g., material removed completely)• Speed of completion of cleaning task
Typical Employee Comments about Cleaning by Hand (detail work):	Employees typically complain about discomfort and/or stiffness in the shoulders/neck and hands/wrists.
Suggested Level II Analysis:	Grip Force Measurement, Postural Analysis, Elemental Task Analysis

Shoulder/Neck

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
1. Reaching	• Work location is too high	123. Raise the person <ul style="list-style-type: none"> • provide a height adjustable chair • stand up to perform work task • use a step stool, platform or ladder 	✓	✓	med low med	med low med	med low med
		32. Lower the work piece/work surface <ul style="list-style-type: none"> • provide adjustable table 		✓	high	med	med
		117. Provide support for the upper body <ul style="list-style-type: none"> • rest arms on nearby surfaces • provide height adjustable armrests 	✓	✓	low med	med med	med med
	• Work location is too far away	38. Move closer to the work location <ul style="list-style-type: none"> • remove obstructions 	✓	✓	med	med	med
		41. Move work piece closer to body	✓		low	med	med
	• Work location is blocked or is in an inappropriate orientation	136. Rotate the work piece <ul style="list-style-type: none"> • rotate the work piece manually • provide a fixture to allow the work piece to be rotated • tilt patient's head towards dental assistant 	✓	✓	low med low	med med med	med med med

Shoulder/Neck (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
2. Arm forces: Repeated contraction of the muscles of the arm or holding/ carrying materials	<ul style="list-style-type: none"> Rarely occurs 	N/A					
3. High speed, sudden shoulder movements	<ul style="list-style-type: none"> Rarely occurs 	N/A					

Shoulder/Neck (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
4. Head/neck bent or twisted	<ul style="list-style-type: none"> Work location is too low for prolonged periods causes stress on the neck 	124. Raise the work piece/work surface <ul style="list-style-type: none"> provide a fixed table to support work piece provide an adjustable table adjust dental chair head support to position patient's head higher 		✓	med	med	med
			✓	✓	high low	med med	med med
			✓		low	med	med
			✓		low	med	med
			✓	✓	med	med	med
			✓		low	med	med
	<ul style="list-style-type: none"> Work location is positioned flat on work surface (see Figure 1.1) 	136. Rotate the work piece <ul style="list-style-type: none"> provide a fixture to angle work piece adjust dental chair head support to position patient's head higher ask patient to tilt his/her head towards dental assistant 		✓	med	med	med
	 <p>Figure 1.1</p>						

Hand/Wrist/Arm

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
5. Bent wrists/repeated wrist movements or repeated forearm rotation	<ul style="list-style-type: none"> Using straight cleaning tool on flat horizontal surface 	77. Provide a tool with an appropriate handle angle		✓	med	med	med
		<ul style="list-style-type: none"> angle handle of tool 					
	<ul style="list-style-type: none"> Work location is blocked or is in an inappropriate orientation 	136. Rotate the work piece	✓		low	med	med
		<ul style="list-style-type: none"> rotate the work piece manually provide a fixture to allow the work piece to be rotated 		✓	med	med	med
	<ul style="list-style-type: none"> Work location is too high 	42. Obtain patient's assistance	✓		low	med	med
		123. Raise the person	✓		low	med	med
		32. Lower the work piece/work surface	✓	✓	med	med	med
	79. Provide a work surface which is adjustable in height		✓	high	med	med	
	<ul style="list-style-type: none"> adjustable table 						
	28. Lower the (patient's) chair	✓		low	med	med	

Hand/Wrist/Arm (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
6. Repeated manipulations with fingers	<ul style="list-style-type: none"> Task requires repeated motions 	66. Provide a power tool		✓	med	med	med
7. Hyper-extension of finger/thumb or repeated single finger activation	<ul style="list-style-type: none"> Rarely occurs 	N/A					
8. Hand/grip forces	<ul style="list-style-type: none"> Duration of holding the tool concentrates stress in the hands Handle diameter is too small (see Figure 1.2)  <p>Figure 1.2</p>	20. Incorporate rest pauses 66. Provide a power tool <ul style="list-style-type: none"> to reduce duration 88. Provide an appropriate handle diameter <ul style="list-style-type: none"> provide cleaning tool with an appropriate handle diameter between 1"-1.5" (2.5-3.8 cm) 	✓		low	med	med
				✓	med	med	med to high
				✓	med	med	med

Hand/Wrist/Arm (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
	<ul style="list-style-type: none"> Handle grip is not compressible 	54. Provide a high friction gripping surface <ul style="list-style-type: none"> wrap tool with compressible grip provide tool with a compressible handle (Caution: provide compressible grips which can be sterilized)	✓	✓	low med	med med	med med
9. High speed hand/wrist/arm movements or vibration, impact or torque to the hand	<ul style="list-style-type: none"> Design or poor condition of tool emits high levels of vibration 	34. Maintain hand tool/power tool <ul style="list-style-type: none"> inspect and repair tool on a regular basis to eliminate unnecessary vibration 74. Provide a tool that minimizes exposure to vibration/ impact/torque <ul style="list-style-type: none"> provide a tool that emits less vibration 	✓	✓	low to med med	med med	med med

Back/Torso

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
10. Exposure to hard edges	<ul style="list-style-type: none"> Work station has hard or square edges 	9. Eliminate exposure to hard edges <ul style="list-style-type: none"> provide padding for edges round off exposed edges 	✓ ✓		low low	med med	med med
11. Hands and fingers exposed to cold temperatures	<ul style="list-style-type: none"> Frequent washing of hands in cold water may be an exposure source 	13. Encourage ergonomic work techniques <ul style="list-style-type: none"> wash hands in warm water 	✓		low	med	med
		93. Provide appropriate gloves	✓		low	low	low
12. Repeated forward or sideways bending movements	<ul style="list-style-type: none"> Work location is too low 	124. Raise the work piece/work surface					
		<ul style="list-style-type: none"> provide a fixed table to support work piece 		✓	med	med	med
		<ul style="list-style-type: none"> provide an adjustable table for the work piece 		✓	high	med	med
		<ul style="list-style-type: none"> raise the dental chair higher 	✓		low	med	med

Back/Torso (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
13. Twisting of the lower back	<ul style="list-style-type: none"> Work location is blocked or is in an inappropriate orientation 	136. Rotate the work piece <ul style="list-style-type: none"> turn the work piece manually provide a fixture to allow the work piece to be rotated 	✓		low med	med med	med med
14. High speed, sudden movements	<ul style="list-style-type: none"> Rarely occurs 	N/A					
15. Static, awkward back postures	<ul style="list-style-type: none"> Work location is too low Work location is too far away 	124. Raise the work piece/work surface <ul style="list-style-type: none"> provide a fixed table to support work piece provide an adjustable table for the work piece raise the dental chair higher 41. Move work piece closer to body 132. Remove obstructions 136. Rotate the work piece <ul style="list-style-type: none"> rotate the work piece manually provide a fixture to allow the work piece to be rotated angle the patient's head towards the dental assistant 117. Provide support for the upper body	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	med high low low low low med to high	med med med med med med med med	med med med med med med med

Back/Torso (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
	<ul style="list-style-type: none"> Chair or stool provides inadequate back support 	115. Provide support for the lower back <ul style="list-style-type: none"> adjust back rest to support the lower back attach a small pillow to back rest to support lower back pull chair forward and lean back while working provide chair with lower back support 	✓		low	med	med
			✓		low	med	med
			✓		low	med	med
				✓	med	med	med
16. Lifting forces	<ul style="list-style-type: none"> Rarely occurs 	N/A					
17. Pushing or pulling	<ul style="list-style-type: none"> Rarely occurs 	N/A					
18. Whole body vibration	<ul style="list-style-type: none"> Rarely occurs 	N/A					

Legs/Feet

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
19. Fixed position, standing	<ul style="list-style-type: none"> Standing surface is hard 	96. Provide appropriate shoe inserts	✓		low	med	med
		86. Provide an appropriate anti-fatigue mat		✓	med	med	med
		52. Provide a footrail or footrest	✓	✓	med	med	med
20. Exposure to hard edges on legs, knees, and feet	<ul style="list-style-type: none"> Front edge of seat is hard or square (see Figure 1.3)  <p>Figure 1.3</p> <ul style="list-style-type: none"> Under surface of work is square 	87. Provide an appropriate chair/stool <ul style="list-style-type: none"> use a cushion to eliminate exposure to pressure point provide seating with rounded front edge of seat 	✓	✓	low med	med med	med med
		9. Eliminate exposure to hard edges <ul style="list-style-type: none"> use padding to cover square edge 	✓		low	med	med

Legs/Feet (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
	<ul style="list-style-type: none"> Leg room is limited under work surface (see Figure 1.4)  <p>Figure 1.4</p>	138. Stand to perform task 79. Provide a work surface which is adjustable in height <ul style="list-style-type: none"> provide work surface with adequate vertical and forward leg room 	✓		low	med	med
	<ul style="list-style-type: none"> Feet are unsupported when seated. (see Figure 1.5)  <p>Figure 1.5</p>	52. Provide a footrail or footrest	✓	✓	low to high	med	med
			✓	✓	med	med	med

Legs/Feet (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
21. Awkward leg postures	<ul style="list-style-type: none"> Work location is too low 	31. Lower the person <ul style="list-style-type: none"> provide a chair/stool to sit on 	✓	✓	med	med	med
22. Standing foot pedal	<ul style="list-style-type: none"> Rarely occurs 	N/A					

Head/Eyes

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
23. Difficult to see/light levels too low/too high	<ul style="list-style-type: none"> Glare directly from a light source: looking towards an overhead light Glare from an overhead light reflected off equipment or worksurface. 	109. Provide protection from glare from overhead lights/task lights <ul style="list-style-type: none"> position work between overhead lights. remove glossy or shiny surfaces from work area place the work station so that it faces a wall or partition. install parabolic louvers to direct light down on the surface. 	✓		low	med	med
			✓		low	med	med
			✓	✓	med	med	med
				✓	high	med	med
	<ul style="list-style-type: none"> Glare directly from a light source: looking towards an uncovered window Glare from an uncovered window reflected off equipment or worksurface. 	108. Provide protection from glare from natural light <ul style="list-style-type: none"> orient work station so that the person faces perpendicular to the window. adjust window coverings provide window coverings 	✓		low	med	med
			✓	✓	low med to high	med med	med med
	<ul style="list-style-type: none"> Glare directly from a light source: looking towards a task light Glare from a task light reflected off equipment or worksurface. 	109. Provide protection from glare from overhead lights/task lights <ul style="list-style-type: none"> adjust the task light to reduce glare. turn off the task light. shield task light to prevent it from shining into eyes. 	✓		low	med	med
			✓	✓	low low to med	med med	med med

Head/Eyes (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
	<ul style="list-style-type: none"> Light levels too high. Light levels too low. Uncorrected visual disorders cause the person to lean forward to see work Text too small to read. Text is difficult to read (poor quality) 	<p>27. Lower the light levels</p> <ul style="list-style-type: none"> remove pairs of fluorescent light bulbs from overhead fixtures. <p>Note: this should be done with the appropriate technical assistance and the agreement of co-workers in the area.</p> <p>22. Increase light levels</p> <ul style="list-style-type: none"> provide task light increase overall light levels to meet the needs of tasks <p>14. Encourage person to have visual disorders corrected</p> <p>18. Improve visual access to work</p> <ul style="list-style-type: none"> increase size of text increase the legibility of text 		<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>low to med</p> <p>med med</p> <p>low</p> <p>med med</p>	<p>med</p> <p>med med</p> <p>med</p> <p>med med</p>	<p>med</p> <p>med med</p> <p>med</p> <p>med med</p>
24. Intensive visual tasks, staring at work objects for long periods	<ul style="list-style-type: none"> Length of work task without a change of position for the eyes. 	<p>8. Distribute intensive activities throughout the process</p> <ul style="list-style-type: none"> perform intensive visual tasks for short periods throughout the day (as opposed to in one continuous session). 	<p>✓</p>		<p>low</p>	<p>med</p>	<p>med</p>

Head/Eyes (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
		20. Incorporate rest pauses <ul style="list-style-type: none"> periodically look away from screen. 	✓		low	med	med