

Gross and fine manipulation

The Occupational Requirements Survey (ORS) publishes job-related information on physical demands; environmental conditions; education, training, and experience; as well as cognitive and mental requirements. The job requirements reflect those necessary for workers to perform critical tasks in support of the critical job functions, and not the capabilities of individual workers. Gross and fine manipulation estimates are physical demand requirements. Where possible, the ORS program provides whether one or both hands are necessary to perform gross and fine manipulation as well as the duration associated with each job requirement by occupation.

Gross manipulation is defined as seizing, holding, grasping, turning, or otherwise working with hand(s). This includes instances when fingers are used as an extension of the hand to hold or operate a tool.

Examples of gross manipulation include:

- teachers using board erasers;
- goalies turning hockey sticks;
- welders using tin snips;
- truck drivers operating steering wheels and gear shifts.

Fine manipulation is defined as picking, pinching, touching or otherwise working primarily with fingers rather than the whole hand or arm. The ORS program considers the job requirement of entering data on traditional keyboards or 10-key pads as a keyboarding requirement, as this is excluded from fine manipulation.

Examples of fine manipulation include:

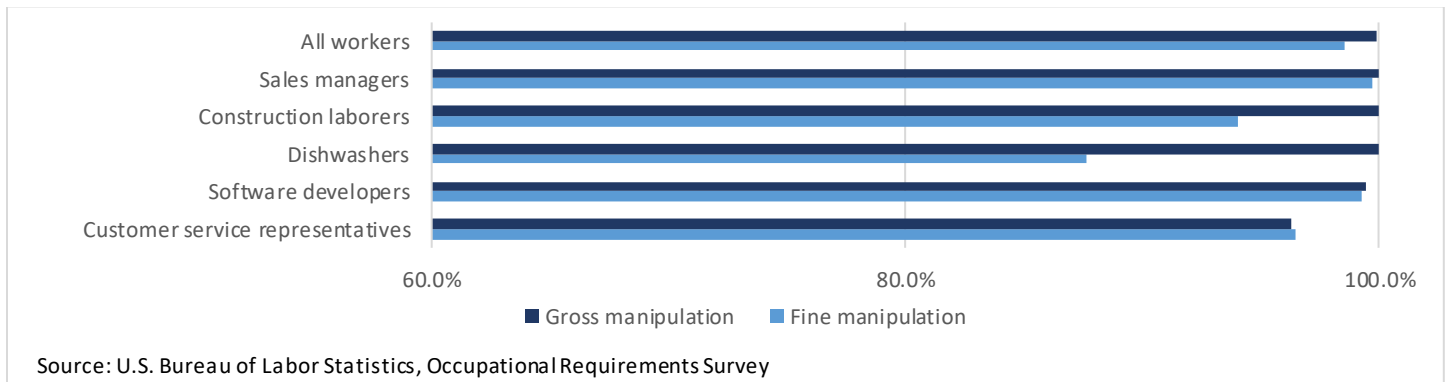
- musicians playing pianos or keyboards;
- bartenders entering drink orders into touch screen point-of-service systems;
- cashiers using a register with hybrid keyboards;
- dental hygienists using tools to scrape tartar off of patients' teeth;
- scientists using pipette to dispense solutions;
- electricians using small tools to rewire lamps.

There are many situations where multiple physical demands are performed concurrently, including both gross and fine manipulation. The ORS program captures these requirements separately. Some examples of both requirements being present include:

- receptionists making phone calls may include gross manipulation (holding the receiver with one hand) and fine manipulation (dialing the phone with the other hand);
- cashiers ringing up customers may include gross manipulation (moving product off conveyer belt) and fine manipulation (returning change and receipt);
- warehouse clerks may have to lift boxes off conveyer belts (gross manipulation), and then enter the serial numbers from boxes using touchscreen scanners (fine manipulation);
- writing is included in both gross and fine manipulation.

In 2021, gross manipulation was required for 99.9 percent of all civilian workers and fine manipulation was required for 98.6 percent of civilian workers. (See Chart A.)

Chart A. Percentage of workers with gross and fine manipulation requirements, 2021



Included in the gross and fine manipulation requirements is whether jobs require workers to perform these physical demands using one hand or both hands. Generally, the sum of performing gross and fine manipulation with one hand and both hands will equal the overall requirement. For example, 100 percent of maids and housekeeping cleaners required gross manipulation and all these workers required both hands to perform gross manipulation. Fine manipulation was required for 96.0 percent of maids and housekeeping cleaners with one hand required for 22.4 percent and both hands required for 73.6 percent. Sometimes the total does not equal the overall requirement due to rounding or because one or both estimates are not available, which occurs if they do not meet publication criteria or there are no workers with the requirement.

Table 1. Percent of workers by physical demand by occupation, 2021

Occupation	Gross manipulation			Fine manipulation		
	Required	One hand	Both hands	Required	One hand	Both hands
Software developers	99.5	39.0	60.5	99.3	53.9	45.4
Chief executives	100.0	29.4	70.6	99.7	52.0	47.7
Computer and information systems managers	99.7	37.7	62.1	100.0	72.9	27.1
Elementary school teachers, except special education	99.9	13.5	86.4	99.9	45.2	54.6
Food preparation workers	100.0	-	100.0	99.7	9.0	90.7
Cashiers	100.0	-	99.6	100.0	18.3	81.7
Security guards	100.0	10.7	89.3	99.8	35.7	64.2
Maids and housekeeping cleaners	100.0	-	100.0	96.0	22.4	73.6

Note: Dash indicates no workers in this category or data did not meet publication criteria.
Source: U.S. Bureau of Labor Statistics, Occupational Requirements Survey

Duration estimates

Gross and fine manipulation duration estimates are categorized by portion of the workday spent performing these physical demands. For example, if over the course of an 8 hour workday (480 minutes) workers lift boxes for less than 5 minutes, gross manipulation would be classified as “seldom,” assuming no other gross manipulation is performed. However, if they lifted boxes for 1 hour each work day, then gross manipulation occurs “occasionally.”

Generally the sum of the duration estimates sums to the overall requirement (gross and fine manipulation). Additionally, the sum of the duration estimates and the not present estimate generally sum to 100 percent.

Table 2. Duration estimates: Amount of the workday spent performing physical demands

Duration	Amount of work day
Seldom	Up to 2 percent of the workday
Occasionally	2 percent up to 1/3 of the workday
Frequently	1/3 up to 2/3 of the workday
Constantly	2/3 or more of the workday

Source: U.S. Bureau of Labor Statistics, Occupational Requirements Survey

The duration of gross and fine manipulation varies amongst occupations. For example, 8.1 percent of office clerks seldom performed gross manipulation, 65.7 percent of construction managers did occasionally, 64.3 percent of dental assistants did frequently, and 40.3 percent of maids and housekeeping cleaners did constantly. Fine manipulation was performed seldom by 24.8 percent of office clerks, occasionally by 72.6 percent of construction managers and frequently by 37.7 percent of dental assistants

Chart B. Percentage of workers by occupation and duration of gross manipulation, 2021

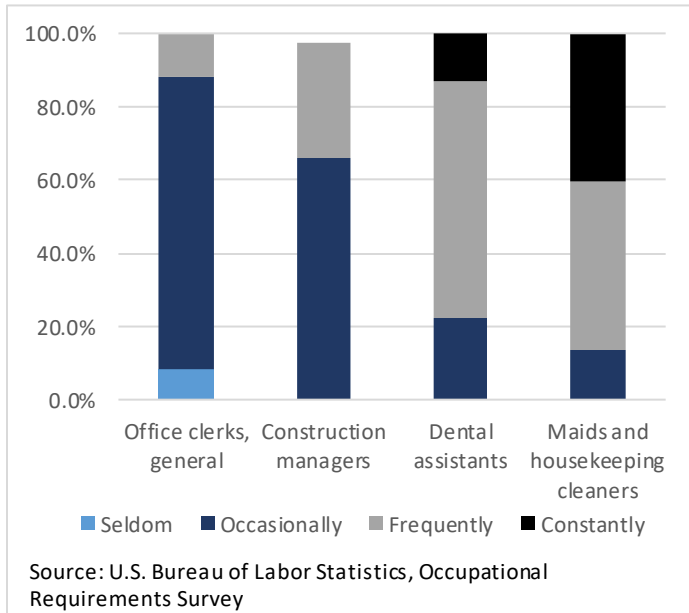
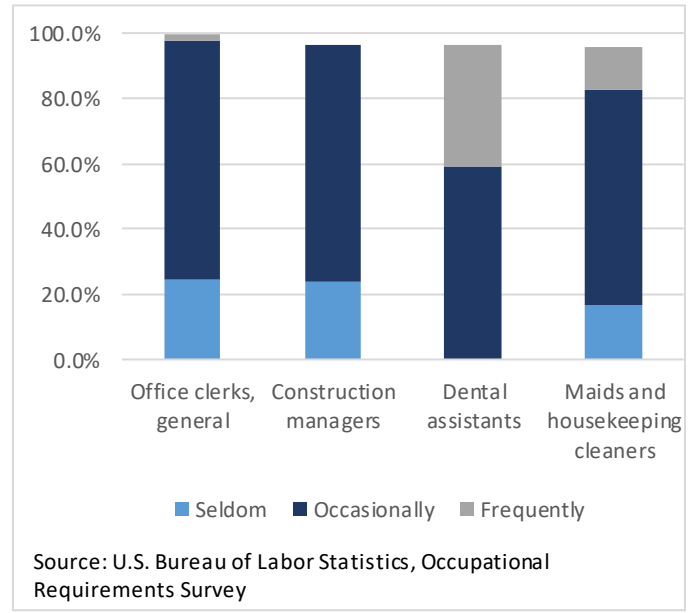


Chart C. Percentage of workers by occupation and duration of fine manipulation, 2021



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