

Apportionment

Apportionment can have a variety of meanings in a variety of settings. For the purpose of this protocol, *apportionment* will apply to a process performed by the physician where a patient's ongoing treatment is attributed proportionally to two (or more) sequential injuries. In such a case, the treating physician may be asked to apportion what percent of the patient's signs and symptoms are the result of the first injury and what percent can be attributed to the subsequent injury. This scenario arises when there are potentially two different payers involved (either two 3rd party payers or the cash patient and one additional payer). Note that injury as used here includes not only high load traumatic events, but repetitive strain or sustained load injuries as well.

Since the physician may need to ultimately express the apportionment in percentages (e.g., 25% to injury #1, 75% attributable to injury #2), the effects of the injury need to be translated into quantifiable measures.

No generally accepted standardized formula has been established to be used by treating physicians when asked to offer an opinion on this matter.* A variety of methods can be used, but none of them have ever been validated. Whichever method the treating physician employs, it must be clearly documented and based on logical principles. As is the case in formal impairment ratings, the seriousness of the diagnosis of each of the two injuries should be considered. Generally speaking, disc herniations with a radicular component, spinal instability demonstrable on radiograph, and fractures are considered more serious than causes of mechanical or "non-specific" back pain such as disc derangements, facet syndromes, lumbar or sacroiliac dysfunction, etc. Any loss of neurological function, especially significant deficits, should also be noted, especially when justifying the seriousness of a second or subsequent injury. Although objective exam findings generally carry the most weight, it is difficult to quantify or apportion most orthopedic and palpation findings. Exceptions include cases where there are significant differences in neurological integrity (e.g., a patient had no neurological compromise after injury one, and grade 3 muscle weakness after injury two) or cases with significant measurable changes in AROM or SLR.

What is commonly used, once the seriousness of the diagnosis and objective physical exam findings have been considered, are measures of the impact of the injury on the patient. Three methods are suggested in this document. One is based on comparing questionnaire results from the two injuries. Another is based primarily on how much and how often each injury affects his or her activities of daily living, work, or recreation. Pain severity can also be factored in. A third method is based on estimates of treatment/recovery time for each of the two separate injuries. These methods have not been externally validated. When offering an apportionment, it is important to cite all of the key factors that were taken into consideration.

* In cases of significant permanent residuals, an independent medical examiner (IME) may be asked to do a formal impairment rating (which can include apportionment). This rating is based on very specific protocols and formulae established by the AMA and requires special training. Because the word *impairment* has a very particular medicolegal meaning, it should be avoided except when part of a formal impairment rating.

METHOD 1: Using Questionnaires

If there is data from questionnaires such as the DASH, NDI, Roland Morris or Oswestry, it can be used these score to provide a comparison. However the timing of the administration of the questionnaires will come into play. If you are going to apply a score from a questionnaire for the first injury, it must be recent enough to reasonably represent the patient's status just before the second injury as opposed to an older score or an intake score.

If asked to give a percentage, divide the score of injury 1 by the score for injury 2, and that will represent the percent contribution of injury one.

Method 1

Injury 1: DASH score 36
Injury 2: DASH score 87.5

$$\frac{36}{87.5} = .41$$

41% can be attributed to injury 1 and 59% to injury 2.

METHOD 2: Making Calculations Based on a Combination of Patient Impact and Symptom Frequency

Another approach is to make calculations based on the intensity of the symptoms/impact on the patient's activities *and* multiply this by the frequency of this impact for each injury. These two values can then be compared and the prior injury (or injuries) can be expressed as a percentage of the patient's current status.

Intensity/patient impact

The intensity can be captured by measuring the effects on the patient's activities. The numerical values from a Patient Specific Functional Scale (PSFS), for example, can be used for comparison. Options also include using the degree of pain (as measured on a pain scale) or some other measure of patient impact (e.g., from your estimate based on patient report of what activities are affected and to what degree).

Frequency

When symptoms and ADLs are affected on a daily basis, the patient can be asked to estimate the frequency in round numbers based on the percentage of the day/week <0.10 (rare), 0.25 (occasional), 0.50 (intermittent), 0.75 (frequent), or > 0.90 (constant) (1.0).

Alternatively, if the symptoms and loss of function are episodic, the patient can report the frequency and duration, which can then be translated into a percentage of that week or month. For example, if the patient is affected 3x/week, that can be captured as 3/7 or .43.

Note: it is best to capture a *numerical estimate* from the patient for what percent of the day or week he or she is affected rather than relying on the patient's *qualitative* terms (e.g., often, sometimes, frequently).

The apportionment process then follows these steps:

Method 2: Example 1

Using PSFS ratings:

For injury 1

The average of the 3 affected activities is 7.6. This means that the patient can engage in the targeted activities at 76% of pre-injury status. So to get the "impairment," take the inverse (24%) to capture the negative impact on the patient. Multiply this by the frequency that the patient has the symptoms to this degree (e.g., occasional, 25% of the time).

$$.24 \times .25 = .06 \text{ (representing the impact of injury 1)}$$

For injury 2

The average of 3 activities is 4.6 (or 46%). Again, take the inverse: 5.4 (or 54%). Multiply this by the frequency that the patient has the symptoms to this degree (e.g., frequent 75% of the time).

$$.54 \times .75 = .41 \text{ (representing the current status of the patient)}$$

The pre-injury factor (.06) is then divided by the post-injury factor (.41).

$$\frac{\text{first accident } .06}{\text{second accident } .41} = .15$$

You would report that 15% of the patient's residual effects were pre-existing from the first accident. The rest of injury impact is from the second accident.

Method 2: Example 2

Using only patient report:

There will be cases where you do not have quantified outcome measures from the patient's previous injuries. If the prior injury was under your care, you can check your chart for indications of severity and impact on ADLs, work and recreation from the history. If the patient was under another doctor's care, you can either have the patient recall severity and frequency from his or her prior injury or acquire the medical charts in the hope that the information is adequately captured there.

The severity of the impact on the patient can be converted to a 4 point scale:

Impact level 1 = based on minimal pain, the signs and symptoms constitute an annoyance but do not impair performance of physical activities;

Impact level 2 = signs and symptoms can be tolerated, but result in about 25% deterioration of physical/work activities;

Impact level 3 = moderate pain, which results in about 50-75% deterioration of physical/work activities;

Impact level 4 = marked pain, preclude 100% of any work or physical activity that precipitates the pain.

Intermediate descriptions can be scaled accordingly (e.g., "moderate to marked" impact would be 3.5).

As in the examples above, the category number, which represents the severity of the impact, is multiplied by the frequency of the symptoms and the same mathematical steps are taken.

For injury 1

The first injury resulted in a lumbar sprain. Looking at the status of the patient's original complaint just prior to the second injury, you judge the pain to be slight (patient reported it as mild or 2/10), but still hampering the patient's normal activities (looking at the effects on work and home, you judge this to be about a 25% impact). This description best fits category 2 in this system. The frequency is judged to be about 50% of the day.

$$\text{Category 2} \times .50 = 1.0 \text{ (representing the impact of injury 1)}$$

For injury 2

The second injury appears to be a more severe lumbar sprain. The pain is now moderate (4/10), and hampers the patient's normal activities to an even larger degree (estimated about 75%). This seems to fit category 3. In addition, the new injury affects his or her activities most of the day (estimated to be about 90%).

$$\text{Category 3} \times .75 = 2.25 \text{ (representing the current status of the patient)}$$

The pre-injury factor (1.0) is then divided by the post-injury factor (2.25).

$$\frac{\text{first accident } 1.0}{\text{second accident } 2.25} = 44\%$$

You would report that 44% of the patient's residual effects were pre-existing from the first accident. The rest of injury impact is from the second accident.

METHOD 3: Making Calculations Based on Projected Treatment Time

Another approach can be considered when the treating doctor is the same for each injury. In this approach, project the remaining period of care anticipated for the first injury and then compare to the anticipated length or frequency of care for the subsequent injury. The comparison can be communicated either as raw numbers or as a percentage.

Method 3

For injury 1

You project that there was another 2 months of care at 1x per week for 4 weeks, then 2x per month for the last month for a total of 6 more visits.

For injury 2

Now with the new injury, you project that you will likely see the patient for another 6 months, starting at 3x per week for the first 2 months, 2x per week for a month, then down to 1x per week for 2 months, and finally 2x per month for the last month for a total of 42 visits.

$$\frac{6 \text{ visits}}{42 \text{ visits}} = .14$$

You would report that 14% of the patient's residual effects were pre-existing from the first accident.

Additional points:

- Because it is not always foreseeable that a case will eventually have to be apportioned, it is useful to insure that all cases have quantifiable baselines capturing effects on ADLs, work and recreation and frequency of symptoms.
- In most cases, pre-existing *asymptomatic* pathology such as degenerative disc disease, and congenital anomalies are not apportionable.

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