Report to the Virginia Workers' Compensation Commission

House Bill 617 (2020 reg. session)

Expanding Coverage under the Virginia Workers' Compensation Act for Injuries Caused by Repetitive Motion

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Executive Summary and Highlights

Executive Summary

The Virginia General Assembly enacted House Bill 617 in the 2020 session, directing the Virginia Workers' Compensation Commission to engage a consultant to study expansion of Virginia's workers' compensation system to include injuries caused by repetitive motion. The Commission engaged WorkComp Strategies LLC to conduct this analysis. We are pleased to offer this report which contains the results of the analysis and options for addressing this change to the Virginia system.

The origin of House Bill 617 is a December 2019 report from Virginia's Joint Legislative Audit and Review Commission ("JLARC") concerning the Virginia workers' compensation system.[1] JLARC found that Virginia was unique among state workers' compensation systems in not covering workplace injuries resulting from cumulative trauma. The Virginia Supreme Court has repeatedly held that the Virginia Workers' Compensation Act (the "Act") does not include traumatic injuries caused by repetitive motion.[2] In 1997 the Act was amended to provide that hearing loss and carpal tunnel syndrome were covered by workers' compensation.

As noted in the 2019 JLARC report, however, "cumulative trauma injuries are a well-established workplace injury." Our research, including interviews with occupational medicine specialists, confirms this assessment. Particularly with respect to frequent use of the arms and hands, "repetition, duration, and force of occupational tasks and the ergonomics of the work environment contribute to soft tissue damage" and nerve compression.[3] We also confirmed, however, that establishing causation for such injuries can be difficult. This is due to several reasons, which we cover in this report. In summary, injuries caused by repetitive motion are well-established occupational injuries, but they present challenges in determining causation.

We provide four options for amending the Act to address this issue, which can be broadly categorized as follows:

1. Amend the occupational disease section and retain the current burden of proof;
2. Relax the causation standard and definitions used for occupational diseases;
3. Remove the exclusion of neck and back injuries as occupational diseases;
4. Amend the definition of injury by accident.

We discuss the risks involved with each option in the report. In terms of claims cost, they are organized above roughly in order of lowest impact to highest, meaning options 1 and 2 cover

[1] Joint Legis. Audit & Rev. Comm'n, Virginia's Workers' Compensation System and Disease Presumptions (Dec. 16, 2019) (available at http://jlarc.virginia.gov/pdfs/reports/Rpt530-1.pdf).

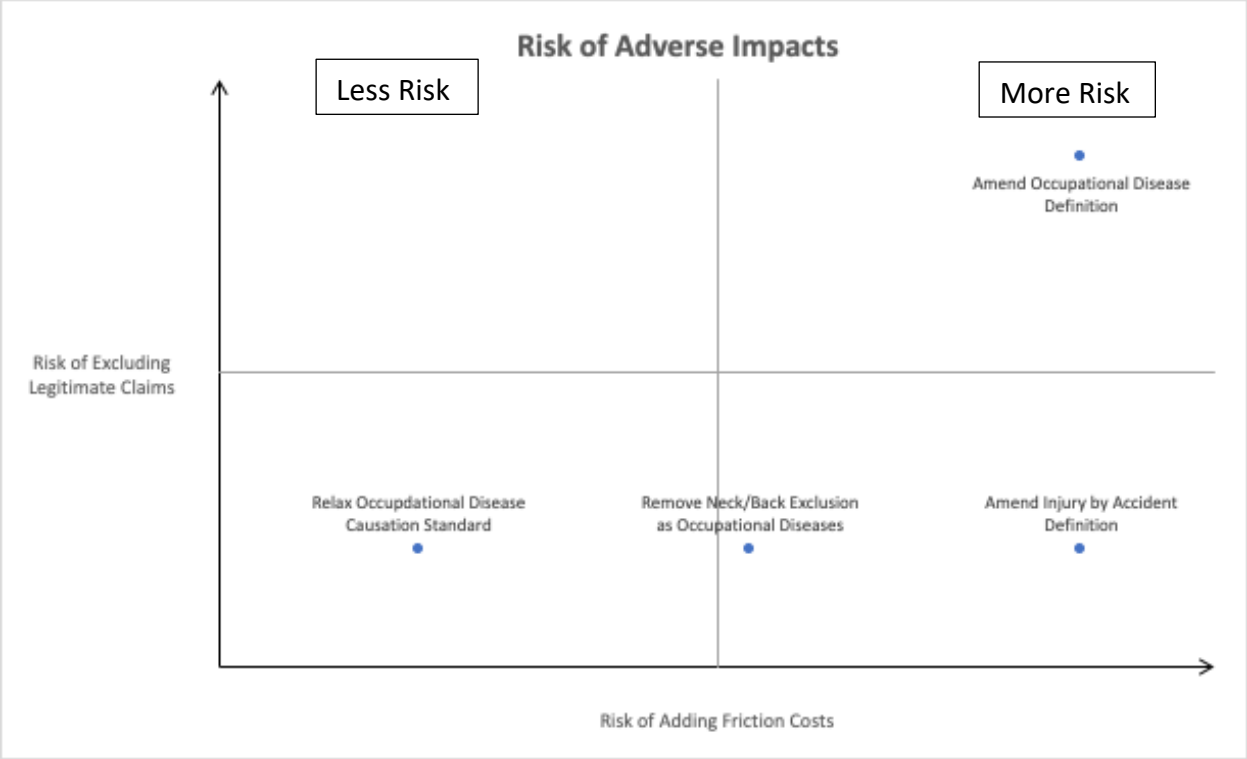
[2] *See, e.g.*, *The Stenrich Group v. Jemmott*, 251 Va. 186, 199 (1996) ("[J]ob-related impairments resulting from cumulative trauma caused by repetitive motion, however labeled or however defined, are, as a matter of law, not compensable.")

[3] See, e.g., O'Neil, Barbara A. et al., "Chronic occupational repetitive strain injury," Can. Fam. Phys. (Feb. 2001) (available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2016244/)

fewer expected additional claims, and options 3 and 4 cover more additional claims. There are other impacts associated with each option which are discussed in the report.

The purpose of this analysis is to identify approaches to expanding coverage in Virginia for legitimate occupational injuries. Any expansion of coverage involves new claims and new costs. But some approaches involve risk of un-predictability and increased litigation, which would add new cost to all stakeholders in the system, including the Commission. We call this risk "friction" cost. We believe that the more predictable the change, the better chance that employers will be able to manage legitimate claims and defend against non-occupational ones. Figure 1 below is a simple visualization of a plot of our four proposed options, where the risk of added friction cost is on the x axis and the risk of excluding legitimate claims is on the y axis. The four options are placed into four quadrants based on their relative weighting on these two factors.

Figure 1: Quadrants of Risk of Adverse Impact

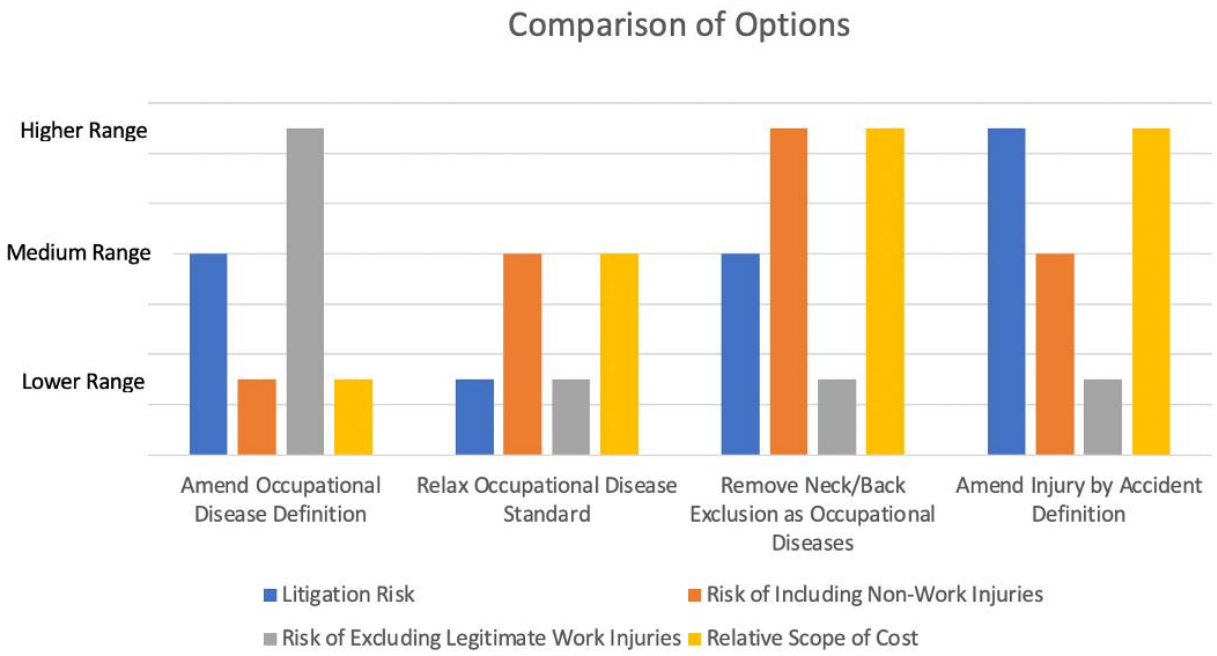


For example, the risk of adding friction costs is greater for the option to amend the definition of injury by accident, and the risk of excluding medically justifiable claims is greater for the option to amend the occupational disease definition while retaining its current causation standard.

Based on insurance data, injuries from repetitive motion constitute approximately 2.1% of workers' compensation injuries. Their respective share of overall claim costs, however, is 2.5%. This is due to some injuries, such as carpal tunnel syndrome, typically involving more expensive treatments, including surgery. Each option provided would have a different impact on the number of new claims added to the system. Costs are positively associated with claim

frequency (both rise together). Figure 2 below shows a qualitative comparison of the four options based on four criteria: the risk of increased litigation; the risk of excluding legitimate work injuries; the risk of including non-work injuries; and the estimated overall cost. The criteria use a relative scale of low/medium/high.

Figure 2: Comparison of Options



For example, the option to relax the occupational disease causation standard would have a lower overall cost impact than removing the neck and back exclusion as well as relatively lower risks of increased litigation, excluding legitimate work injuries, and including non-work injuries. Adopting the option to amend the occupational disease definition to include RSI, but without also modifying the causation standard and associated higher burden of proof, would likely have a lower overall cost impact, but heightened risks of litigation and of excluding legitimate work injuries. This analysis suggests that in expanding coverage for injuries caused by repetitive motion, the General Assembly should consider also modifying the causation standard and required items of proof for occupational diseases, as it would reduce the risk of failing to achieve the stated goal of expanding coverage for occupational RSI.

In summary, workers' compensation is a system of insurance that provides coverage for medical treatment and lost income benefits to employees injured as a result of their employment. It is intended to provide employers and their employees with compensation when workplace injuries occur without having to resort to legal expenses. Occupational injuries from repetitive motion constitute a relatively small portion of claims across the country, and we anticipate Virginia would have a similar experience, although depending on how this change is implemented, Virginia may experience more claims and associated costs than anticipated.

Highlights

What is Workers' Compensation?

- Workers' compensation provides statutory benefits for work injuries
  - Employers purchase insurance to cover these benefits (or become approved self-insured employers)
  - Virginia cities and counties are all self-insured or members of self-insured groups
- Each state has its own system
  - States often converge on common models for the law
  - There is no federal oversight over the state systems
  - Federal employees are not covered by the state systems
- An employer's insurance rate is based on the employer's expected benefit payments
  - The more dangerous the work, the more expensive the premiums
  - If an employer has a history of accidents, premiums will increase
- Benefits that are available for an injury are set by state statute
  - Medical treatment for the injury typically paid for life of the worker
  - Lost wages are paid during recovery from the injury
  - A defined lump-sum payment for permanent loss of body function
- Not every claim of injury is covered
  - State laws require a causal connection between the injury and medical treatment to the employment
  - Legal disputes can arise, which are litigated in workers' compensation tribunals
- Virginia's system is administered by the Virginia Workers' Compensation Commission
  - Administration principally involves resolving disputes
  - Other functions include enforcing insurance coverage and administering self-insurance

Injuries Caused by Repetitive Motion

- Refers to a category of injuries resulting in soft tissue damage to muscles and tendons (more frequently) and nerve compression (less frequently)
  - These can be caused by repetitive physical motions, stresses, and postures
  - Common work activities involved: packaging, assembly, welding, sewing, lab work, computer work, filing, bricklaying, meat-processing, and vehicle driving
  - Common diagnoses: carpal tunnel syndrome, tendinitis, bursitis, tenosynovitis, epicondylitis
- Virginia does not generally cover such injuries by workers' compensation
  - Historically these have been covered by workers' compensation in Virginia
  - In the 1980s and 90s Virginia court decisions made clear the requirement of a single "incident" and to not cover smaller, repetitive "incidents"
  - In 1997, the General Assembly added carpal tunnel syndrome
    - This was placed in the "occupational disease" section
    - Hearing loss, though not caused by "motion" but by smaller, repetitive "traumas" was also added

- Issues and concerns with occupational repetitive stress injuries
    - These injuries can arise from non-work activities and personal factors
        - Common non-work activities: exercise, sports, hobbies, computer use, home repair, gardening
        - These injuries can be exacerbated by other factors: age, weight, gender, and other illnesses such as arthritis
    - Virginia has taken a measured approach to covering conditions in workers' compensation that are common among the general public, such as cancer and respiratory conditions
- Neck and back injuries can sometimes occur as a repetitive stress injury
    - These injuries typically refer to conditions arising relatively slowly over time while performing job duties
    - Some neck and back injuries are caused by a somewhat discrete piece of work, which do not qualify as a "sudden" injury
    - Litigation would be expected seeking to cover neck and back injuries that are more like a "sudden" injury, but are not covered as a "sudden" injury

Frequency and Cost of Occupational Repetitive Stress Injuries

- Carpal tunnel syndrome in workers' compensation is less than 1% of insurance covered injuries across the country
- Other repetitive stress injuries are less than 2% of covered injuries
- Claim costs for carpal tunnel syndrome are generally much higher than other work injuries
    - Involves surgery more often than other RSI and more time away from work
    - Approximate average claim costs for all claims nationally are $10,850 compared to $19,520 for carpal tunnel claims (Claims from 2014, as of September 2020)
- Costs for other repetitive stress injuries are in line with common workplace injury costs
    - Typically treated with rest, anti-inflammatories, and stretching
    - Often simple job adjustments improve symptoms
    - These are not currently covered in Virginia

Issues with Expanding Coverage in Virginia

- Although carpal tunnel is legally covered in Virginia, it does not appear to be covering a proportionate number of carpal tunnel claims relative to other states
    - Virginia's rate of carpal tunnel is a small fraction of other states' experience
    - Some of this is due to poor reporting and reporting errors
    - The less hazardous employment mix in Virginia might explain lower claims
- Virginia's legal standard for covering carpal tunnel is strict
    - Burden of proof is "clear and convincing (not a mere probability)"
    - Worker must prove that carpal tunnel was caused by work activities
    - Worker must prove that carpal tunnel was not caused by non-work activities
    - North Carolina has a similar strict standard for carpal tunnel, and their frequency is low, although not as low as Virginia's

Options and Associated Risks

1. Add repetitive stress injuries as an occupational disease but retain the existing structure in the occupational/ordinary disease sections
    - This would have an increased risk of litigation, given the difficult statutory scheme for occupational/ordinary diseases
    - Would involve a low risk of including non-work injuries but a high risk of excluding legitimate work injuries
2. Add repetitive stress injuries as an occupational disease and re-structure the occupational/ordinary disease sections and burden of proof
    - This would have the least risk of increased litigation
    - Would involve a moderate risk of including non-work injuries but a low risk of excluding legitimate work injuries
    - Carpal tunnel syndrome (only RSI now covered) is roughly 5 times lower than surrounding states, and 7 times lower than the national average
3. Add repetitive stress injuries as an occupational disease and remove the restriction on neck and back injuries
    - Neck and back disease-like conditions more difficult in assessing causation
    - This would have an increased risk of litigation, as neck and back injuries excluded as not being "sudden" would be pursued as diseases
    - Would have a low risk of excluding legitimate injuries, but a moderate (perhaps even high) risk of including non-work injuries
4. Add repetitive stress injuries as an injury by accident
    - Although difficult to estimate, this would likely result in more litigation, claims, and related costs added to the system
    - It has the most risk of affecting the overall stability of the system
    - It is the most difficult to construct needed statutory changes, that considered all potential system-wide impacts

Overall System Cost Estimates

- Virginia is a relatively low-cost state for workers' compensation
- Virginia's insurance rates are currently 75% of the median costs nationwide (does not include self-insurance)
- In 2018, workers' compensation in Virginia cost about $1.1 billion in insurance premiums and about $500 million in cost to self-insured employers
- Adding repetitive stress injuries should add approximately 1,200 claims annually at a cost of approximately $20 million to the Virginia workers' compensation system
- The added cost stems from more from the relatively expensive carpal tunnel claims; other RSI claims added would be in line with average claim costs
- Range of costs due to policy choices
    - Retaining current restrictive occupational/ordinary disease structure of the code would likely result in fewer covered claims, but likely more litigation
    - Relaxing current exclusion of neck and back conditions as covered occupational diseases would likely result in more covered claims, and increased litigation

HB 617: Injuries Caused by Repetitive Motion

Expanding Coverage of the Virginia workers' compensation system to include injuries caused by repetitive motion

I. Background

Recent advances in automation and technology, and global industrial and economic shifts, have dramatically changed how work is performed in the U.S. One significant positive impact has been an increase in workplace safety and a reduction in workplace injuries. Advances in medical treatment and technology have also had positive impacts on workers' compensation systems. Available treatment modalities have supported quicker, more effective recovery from injury. This has also resulted in more precise identification of causes of conditions and targeted treatments.

Workers' compensation is state based, meaning that each state charts a course in developing its respective workers' compensation system. Virginia's system was enacted in 1919. All workers' compensation systems originally covered only "traumatic" accidents, such as fractures and burns. Gradually more and more conditions were covered. Virginia added coverage for occupational diseases in 1944. Legislatures have struggled to expand systems to cover legitimate work injuries, without un-intentionally allowing recovery for personal injuries.

Injuries, especially when relatively severe, can have a tremendous impact on the livelihood of employees and business operations of employers. Employees can lose their source of income, and be faced with mounting, expensive medical treatment. Employers can lose a valuable, experienced employee. The stakes are high, and disputes arise. Workers' compensation judges are on the front lines of resolving these disputes, but sometimes decisions are appealed in a state's appellate courts. In a stable system a consistent body of law develops, and stakeholders use a predictable interpretation of the law to inform how they deal with issues as they arise.

Which leads us to injuries caused by repetitive motion. These injuries can be controversial when they are connected with work. Their symptoms can be vague. Their origins can be difficult to identify. They can be caused by work, but they can also be caused by non-work activities of daily life. A great example is "tennis elbow," so named because of its prevalence among tennis players. This condition, however, is also common in the meat-processing industry.[4]
Virginia, like other states, has enacted laws to address this challenge of covering legitimate work injuries, and avoid covering personal injuries. The purpose of the laws is straightforward: employers should compensate employees when their employment causes them to be injured and become disabled. Virginia courts, however, have interpreted Virginia's workers'

[4] Walker-Bone, K. et al., *Occupation and Epicondylitis: A Population Based Study*, Rheumatology (Oxford: 2012) (available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3427015/).

compensation laws narrowly to restrict coverage. Currently, only carpal tunnel syndrome is covered, and as will be shown the extent of Virginia's coverage for this condition is limited.[5]

This report is in response to Virginia House Bill 617 (2020 regular session), to evaluate injuries caused by repetitive motion and suggest options for amending the Code of Virginia to expand coverage for such injuries. This report addresses the following questions:

- What are repetitive stress injuries?
- How common are they in workers' compensation?
- How expensive are they?
- Why aren't they covered in Virginia?
- What are options for covering them in Virginia?
- What are policy considerations for each option?
- What are risks involved in each option?
- How much would this cost?

II. What is an Injury Caused by Repetitive Motion?

This sort of injury goes by other synonymous names: repetitive stress injury and cumulative trauma. The National Institute for Occupational Health and Safety has taken the term "musculoskeletal injury" to encompass repetitive motion injuries. We use repetitive stress injury ("RSI") to describe any damage to nerves, tendons, ligaments, or muscles stemming from motions and similar physical stresses that inflict the observed damage. This motion may be thousands of repeated microtasks, such as key data entry or twisting an object on an assembly line. The activity may also be less frequent but more stressful, such as occasionally lifting baggage overhead or forcefully twisting screws or bolts. The key point is that some specific task in the performance of work, when done often enough, causes damage to the body.[6]

To be a compensable injury, the purported damage must be diagnosed by a physician with testing or other examination. Also, the physician must see (depending on the causality standard of the state) a plausible connection to work as a contributing cause or the dominant cause. RSI is very commonly found with certain types of employment, such as meat cutters and assembly line workers. However, almost any job could produce RSI under some tasks and certain predispositions of the worker to injury. Personal risk factors, such as age, gender, weight, diabetes, and smoking habits, may confound the assessment of work-relatedness of the injury.

To re-cap: Work activities such as repetition, particularly when involved with the use of force and poor ergonomic, contribute to musculoskeletal injury and sometimes nerve damage. Establishing a single source of the cause of such injuries, however, is sometimes difficult.[7] The

[5] Hearing loss is also covered, but our focus is on injuries caused by repetitive motion. We have provided options for also including hearing loss generally with the definition of a repetitive stress injury.
[6] See brief posted by the Nat'l Inst. of Neurological Disorders & Stroke, Repetitive Motion Info. Page, found at: https://www.ninds.nih.gov/Disorders/All-Disorders/Repetitive-Motion-Disorders-Information-Page.
[7] See, e.g., O'Neil, Barbara A. et al., "Chronic occupational repetitive strain injury," Can. Fam. Phys. (Feb. 2001) (available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2016244/)

Virginia workers' compensation system does not generally cover such injuries (with the exception of carpal tunnel syndrome and hearing loss), which is unique among states in the U.S.

III. Frequency of Repetitive Stress Injuries

Next, we address how frequently repetitive stress injuries ("RSI")[8] occur in the workplace.[9] To estimate the frequency of RSI claims we use the frequency of claims for certain injury categories. The injury diagnoses we used are as follows: sprains, strains, carpal tunnel syndrome, and all other cumulative trauma injury types.[10] For the first two diagnoses the cause of injury is coded as "repetitive motion" or "cumulative trauma." For carpal tunnel we use that specific diagnosis regardless of the coded cause of injury. The last diagnosis is a catch-all category for claims with a nature of injury coded as "all other cumulative injury." These groupings do not overlap; we believe they capture a large majority of RSI claims.[11] We note that coding of claims can contain errors, but the errors apply to all states; thus the comparison of Virginia with other states is not obviously distorted by worse data coming from Virginia.

The percentage share of RSI is the count of injuries divided by total injuries for the geographic area under consideration. To compute the average rate we use cumulative claims spanning a five year period, namely accident years 2014 to 2018.[12] We use two state comparisons: 1) the region around Virginia (DC, KY, and MD), and 2) countrywide experience.[13]

We estimate that RSI represent 2.1% of total claims. This rate includes carpal tunnel injuries. This is based on data for insured claims, but it is roughly confirmed by BLS data and Electronic Data Interchange (EDI) data reported to a sample of other states. We did not observe any reason to believe that self-insured employers on the whole would have a *significantly* different rate than insured employers, so we apply the insurance estimate to the self-insured

[8] Such injuries are referred to by lawmakers, courts, and researchers and even by medical professional in various ways, for example injuries caused by repetition motion, repetitive stress, repetitive strain, cumulative trauma, and overuse. We use "repetitive stress injury" or "RSI" to include all these synonymous meanings.

[9] In general, a work injury is reported by an employee or witness to the employer. The employer is required by OSHA to log the injury, and the employer is also required to notify its workers' compensation insurance carrier. This is known as a "claim." The insurance carrier then reports the injury to the state workers' compensation agency, and if they accept the claim they also report payments. We have compiled data on both reported injuries (OSHA data collected by the Bureau of Labor Statistics) and on workers' compensation claims (insurer data from the National Council on Compensation Insurance and from state workers' compensation databases).

[10] Hearing loss claims are sometimes grouped into "cumulative trauma" claims. This condition is included in Va. Code §§ 65.2-400 & -401 as a covered occupational disease, along with carpal tunnel syndrome. H.B. 617 focused on "injuries caused by repetition motion" and we limited our analysis here to such injuries. But hearing loss and RSI are logically similar insofar as they can arise over time from repetitive "micro" traumatic events, and in our proposed definition we include injuries caused by "noise." As for frequency, hearing loss represents a tiny fraction of claims: 0.08% of all reported claims. We also note that 69% of these claims were reported to have been denied for failing to meet the burden of proof.

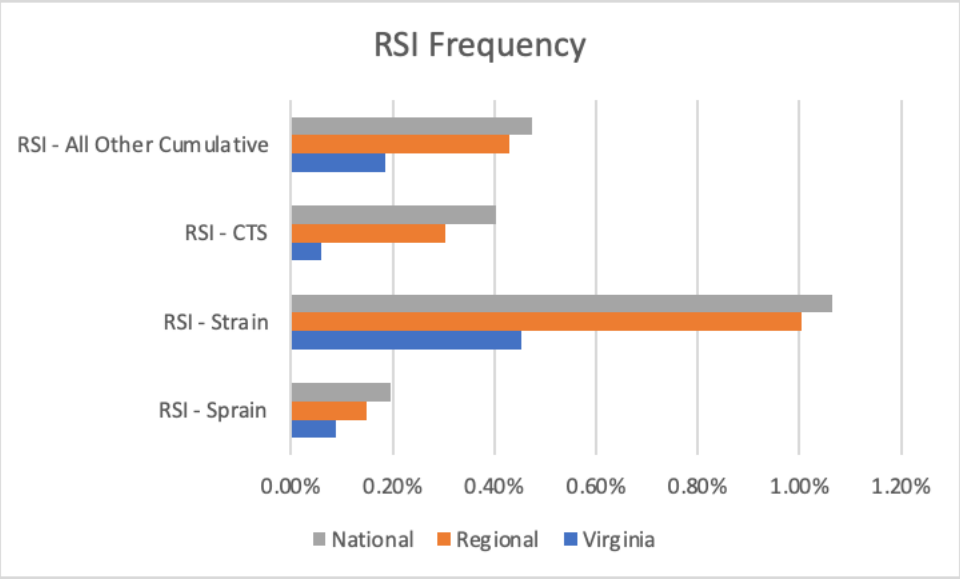
[11] See the Appendix for additional detail about the data sources and these coding parameters.

[12] An "accident year" groups all claims in which the reported injury date falls within a particular year.

[13] "Countrywide" is a term used by NCCI to refer to a broad set of states that it collects data for; there are 36 NCCI states, and other non NCCI state data is often also available. See the Appendix for additional detail.

population.[14] For states around Virginia the rate is 1.9%. Carpal tunnel syndrome represents 0.4% of claims across the nation; in Virginia, however, these claims are 0.06% of all claims. In the region they were 0.3% of claims, which is more in line with the national rate. The following figure shows the distribution of the incident rate of RSI among across the respective RSI nature of injury codes.

Figure 3: Frequency of Repetitive Stress Injuries by Injury Type



In choosing how Virginia might compare to the other geographic regions, it is worth remembering that Bureau of Labor Statistics injury surveys show Virginia having a significantly lower incidence rate for RSI than Kentucky, DC, and the national average. Keep in mind that, in theory, Virginia's current incidence rate for *paid* RSI, other than for carpal tunnel syndrome, should be zero, as these claims are routinely not accepted. The BLS data is based on *reported* injuries, and not claims payable under workers' compensation. The BLS data generally confirms reported insurance data that RSI claims (including CTS) have a very low frequency in Virginia.

The insurance data in the above chart showed, however, that RSI claims were not zero, but were paid in Virginia. This could be for several reasons. First, an adjuster may prefer to pay a claim while investigating, in order to leverage claim-management tools not available if denied, for example using panel physicians. Second, causation may not be clear, and the adjuster chooses to pay a claim in a close case rather than litigate. Third, the injury may be relatively minor, and the claim handling approach is to pay the claim and resolve it with a successful claim

[14] We found that the industrial mix of self-insured employers in Virginia is substantially different from insured employers, as measured by payroll groupings, and that some categories of employment that are at relatively higher risk of RSI are more prevalent among Virginia self-insured employers than among Virginia employers generally. However, over two-thirds of Virginia self-insured employer payroll consisted of the government sector, which has a lower incidence rate of RSI than the national rate, and we would estimate that RSI frequency among Virginia self-insured employers would be at or below overall estimates. More detail is provided in the Appendix.

and return-to-work outcome, rather than deny it and risk the claim becoming litigated and much more expensive. Fourth, a claim may be initially reported to the employer as a repetitive motion injury and so recorded on the insurance report, but after investigation the claim is determined to not be caused by repetitive motion and allowed for compensation, but without updating the nature of injury code. Regardless of why some RSI are in fact being paid in Virginia, it is clear that the Virginia frequency is comparatively low.

To recap: we estimate that RSI, if covered as in other states, would account for approximately 2.1% of covered claims in Virginia. Additional information concerning frequency is contained in the Appendix.

IV. Cost of Repetitive Stress Injuries

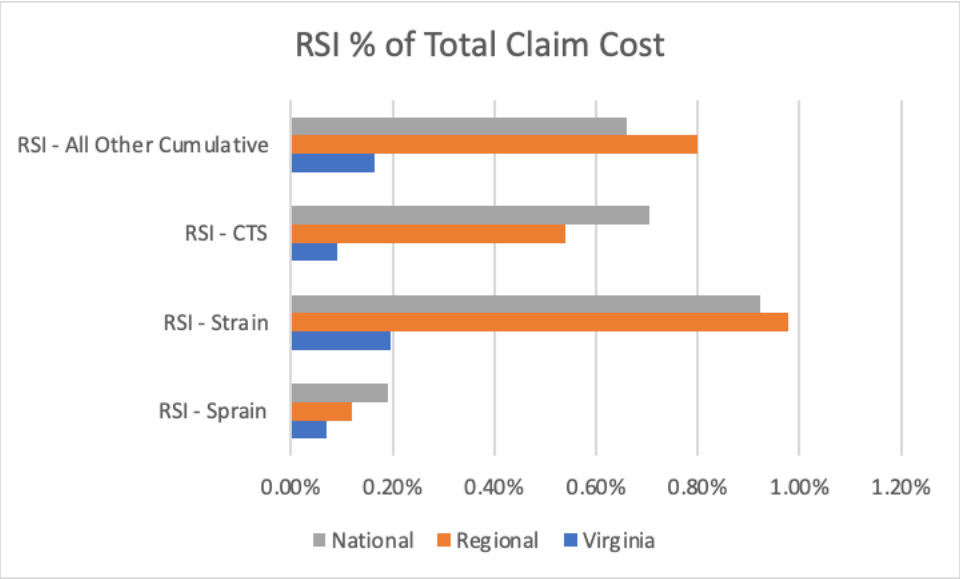
Next, we will report on the cost of occupational RSI. The impacts of expanding coverage for RSI in Virginia are primarily from allowing more work-related claims to be accepted and paid. As just set forth, our projected frequency of RSI represent a relatively small portion of overall workers' compensation claims. Thus, the impact on employers (in the form of additional premiums for these claims for insured employers or direct claim costs for self-insured employers) can be estimated based on per-claim costs and the anticipated additional claims. We collected data of claim costs paid by insurers to form a basis for estimating the amount of lost wages (known as "indemnity") as well as medical costs.

To estimate the cost of these new injury claims we span the range of possibilities by using average medical and indemnity costs for Virginia, Region and Countrywide. These average costs are broken out by the same injury categories described above for frequency.[15] Estimating medical cost is particularly difficult because: 1) Virginia has relatively little reliable (accurately coded) experience with medical treatment of RSI; and 2) the new Virginia fee schedule is likely to draw down average treatment cost from historic levels. Further complicating matters is the fact that our best medical cost data is subject to "development," which is the actuarial recognition that the ultimate, full amount of the medical costs takes many years of "development" to reach its ultimate level. For this reason, the paid costs over the sample period 2014-18 understate the ultimate cost for those years. As explained later, we attempt to correct for this with development factors.

We estimate that that overall share of total claim cost for RSI is 2.5%. This includes carpal tunnel syndrome, which has a much higher per-claim average cost. Excluding carpal tunnel, RSI are 1.8% of total claim costs. For the region RSI are 2.5% of total claim cost. Currently, in Virginia, RSI represent 0.55% of total claim costs. Note: we used the average of total proportionate costs for claims in accident years 2014-18, with payments accumulated through September 2020. The following figure shows the distribution of the proportionate claim cost across the respective RSI codes.

[15] In our experience, claim costs tend to be somewhat positively skewed from the median because of expensive "outlier" claims.

Figure 4: Repetitive Stress Injuries as a Percentage of Total Claim Cost



Next, we turn to costs per claim. We estimate that cost per claim for RSI is $17,000. This includes carpal tunnel, which is costlier per claim than other RSI. Excluding carpal tunnel, RSI costs per claim are $15,090. Regional experience is lower on average, and if Virginia's experience is more in line with the region, then the $17,000 estimate could be a little high. Virginia's current per claim cost, across all claims, using this same approach is $15,050.[16]

So far we have only considered employer costs. To complete the picture one should also consider the benefits to employees. Virginia workers that suffer injury from repetitive motion or stress would clearly benefit from the broadened coverage in Virginia. Currently, those workers with health insurance may have their treatment costs covered, but those without insurance will face out of pocket expenses. The indemnification of work-time lost or loss of a job is difficult to estimate. Some employers may provide workers with job modifications to accommodate their (non-covered) condition. Other workers may try to "tough out" the symptoms of RSI for as long as possible. Still others may be forced to change employment, e.g., someone with chronic bursitis or carpal tunnel syndrome from the meat cutting line will likely not return to that kind of work. We would add that these adverse consequences to workers have been recognized and made compensable in all states but Virginia.

In summary, RSI per claim costs are largely in line with other claims. Virginia costs per claim are generally higher than other states, although early indicators since adoption of the fee schedule in 2018 show this coming more in line with national cost levels.

[16] For per-claim estimates we used *only* the average costs in insured claims for the 2014 accident year, as of September 2020. We have also added a development factor to allow for development of such claims for year-on-year costs to their ultimate cost. We then add a factor based on trends to the benchmark year of 2020. See the Appendix for additional detail. Note that this is all claims, including those involving only medical expenses (medical-only claims) and those that include benefits for time away from work (lost-time claims).

V. Coverage of Repetitive Stress Injuries in Virginia

Next, we provide analysis of why Virginia currently does not cover RSI. We first note that such injuries were covered at least in part from 1944, when Virginia amended the Act to cover occupational diseases, until approximately 1985, when the Virginia Supreme Court ruled that RSI were not covered occupational diseases.[17] Since 1985, the General Assembly has attempted two amendments of the Act to provide some coverage for RSI. Currently only carpal tunnel syndrome is a covered RSI, but as shown in the frequency analysis above, the coverage for this condition in Virginia is far less than in other states.

Workers' compensation injuries are typically classified as either a "specific" traumatic injury or as an occupational disease. For example, the Workers Compensation Insurance Organizations groups injuries as either "Specific Injury," such as amputations, burns, and fractures, or "Occupational Disease or Cumulative Injury," such as silicosis, dermatitis, and contagious disease.[18] Repetitive stress injuries are typically classified in this "disease" category, although the line between "trauma" and "disease" is not precise. State workers' compensation laws vary in how they classify RSI, but most use the "disease" classification.

There is also not consistency among medical providers concerning the "injury" vs. "disease" distinction. Some medical practitioners will diagnose using a "disease" type classification, whereas others will use an "injury" type classification. For example, medical treatment coding based on ICD-10 diagnostic definitions refer to "Mononeuropathies of the upper limb" as one of many "Diseases of the nervous system." Within the mononeuropathy category is "Carpal tunnel syndrome." Other ICD-10 diagnostic codes, however, refer to an "Injury of nerves at wrist and hand level" as a type of "Injury, poisoning, and certain other consequences of external causes." It seems obvious that workers' compensation coverage should apply to both situations, when work related, and that compensability should not turn on whether repetitive work motion causes an "injury of nerves at wrist and hand level" versus one that causes a "mononeuropathy of the upper limb."

In Virginia, RSI historically have been treated as occupational diseases. The Virginia Supreme Court, however, has consistently ruled that such conditions are not diseases, but traumatic injuries. The Court has catalogued how prior decisions had dealt with (or failed to deal with) this distinction. Importantly, the Court observed that the distinction was not academic: "[A]n impairment resulting from cumulative trauma caused by repetitive motion [is] an impairment which must be classified as an injury, not a disease."[19] The Court considered this a legal issue, and not a medical one: "whether a proper definition has been used to test the authenticity of a doctor's opinion is strictly a legal question." The Court focused on the phrase "cumulative

[17] We provide additional detail about Virginia's treatment of occupational disease when addressing options for amending the Act to expand coverage for RSI.

[18] See Workers Compensation Insurance Organizations, Nature of Injury Codes (Mar. 2020) (available at https://www.wcio.org/Active%20PNC/WCIO_Nature_Table.pdf).

[19] *The Stenrich Group v. Jemmott*, 251 Va. at 186, 198 (1996). Medical evidence in *Jemmott* was that the conditions at issue (carpal tunnel syndrome and tenosynovitis caused by repetitive work motions) were a disease.

trauma caused by repetitive motion" and ruled that, as a matter of law, this was not a disease. The Court also deferred to the General Assembly as to expanding coverage to include "disabilities resulting from both injuries and diseases caused gradually by repeated trauma."

Carpal tunnel syndrome is a common type of RSI, and it *is* covered in Virginia, despite being a "micro-trauma" injury. This is because in 1997, in response to the *Jemmott* decision, the General Assembly amended the Act to consider hearing loss and carpal tunnel syndrome as "ordinary diseases of life."[20] To re-cap: Virginia covers only carpal tunnel syndrome and hearing loss among the category of repetitive stress injuries. Why is this? We believe that the likely reason why coverage is limited is because occupational injuries generally are not broadly covered by workers' compensation. Diseases, unlike sudden, traumatic injuries, are often latent for years, and cause can be enigmatic. Attribution to a particular employment can be difficult. When workers' compensation was first established in the early 1900's, diseases were excluded. Gradually, however, states came to recognize that occupational disease was a risk of employment and should be covered. Virginia followed suit in 1944, although the standard used in Virginia for evaluating whether a disease is occupational is unique among states. We discuss this in detail in the next section concerning options for amending the Act to provide coverage for RSI.

VI. Options for Covering Repetitive Stress Injuries in Virginia

Worker's compensation systems are intended to provide benefits for workplace injuries. Virginia, like most states, uses a definition of "injury" to define what is covered: "'Injury' means only injury by accident arising out of and in the course of the employment or occupational disease as defined in Chapter 4 (§ 65.2-400 et seq.)."[21] There are two basic approaches to accomplishing the change to cover RSI in Virginia: 1) amend the definition of injury; or alternatively 2) amend the occupational disease section. The 2019 JLARC report explained that having options would help the General Assembly "decide how to afford Virginia workers the opportunity to obtain compensation for work-related cumulative trauma injuries while also protecting Virginia employers and insurers from bearing the costs of non-workplace injuries."[22] The options that follow highlight potential modifications to the Code of Virginia.

As previously mentioned, the General Assembly in 1997 modified the Act to cover carpal tunnel syndrome and hearing loss. This was accomplished by amending the occupational disease section. Although the standard used is strict, and Virginia's coverage of carpal tunnel syndrome has been very limited, we believe that the General Assembly could similarly accomplish expanding coverage for RSI by amending the occupational disease section. But we will analyze both approaches. Either approach, however, should include a specific reference to prior non-

[20] The Virginia Supreme Court has recognized that this amendment, to add hearing loss and carpal tunnel syndrome as covered ordinary diseases, was "within the purview of the Act" in contradiction to the ruling in *Jemmott*. Adams v. Alliant Techsystems, Inc. (Apr. 20, 2001) (Upon Questions of Law Certified by the U.S. District Court for the West. Dist. of Va.) (available at http://www.courts.state.va.us/opinions/opnscvwp/1002613.pdf).
[21] Va. Code § 65.2-101.
[22] JLARC 2019 Report at 36.

coverage for such conditions, to make clear that the amendment is intended to provide coverage for such conditions.

A. Option: Amend the Occupational Disease Section

The first option we consider for covering injuries caused by repetitive motion is to amend the occupational disease section. In Virginia, an "occupational disease" is a disease that arises out of and in the course of the employment, with several qualifiers to prevent non-workplace diseases from being covered. There is also a concept of an "ordinary disease of life," meaning a disease "to which the general public is exposed outside of the employment." An "ordinary" disease may be covered, if shown by "clear and convincing evidence (not a mere probability)" that the disease resulted from the employment, and provided that it is shown that the disease "did not result from causes outside of the employment." Va. Code § 65.2-401. As just mentioned, hearing loss and carpal tunnel syndrome are specifically included in the ordinary disease of life section. Amending the occupational disease section to cover repetitive motion injuries would involve two changes: 1) adding repetitive motion injuries as covered conditions, similar to how hearing loss and carpal tunnel syndrome are deemed covered (and including carpal tunnel syndrome within that modification); and 2) structuring the change such that occupational conditions are covered, and non-occupational conditions are excluded.

First, adding repetitive motion conditions involves an appropriate definition. Hearing loss and carpal tunnel syndrome are not defined in the section, instead relying on their plain meaning, but using a laundry-list approach is not ideal because terminology changes over time, and also because inevitably conditions are likely to be missed and medical science does not strictly adhere to statutory labels. Like other states, we recommend using general terminology, such as repetitive motion conditions, and adding explanatory language to provide a workable definition and the scope of its meaning. This would be accomplished by adding a proviso to Va. Code § 65.2-400(A), such as the following (new text underlined):

> [T]he term "occupational disease" . . . <u>specifically includes injury from conditions resulting from physical stressors including repetitive and sustained motions, exertions, posture stresses, contact stresses, vibration, or noise. Repetitive and sustained physical stress is not required to occur over a particular period, so long as such a period can be reasonably identified and documented. Notwithstanding prior decisions to the contrary, such injuries shall be covered injuries if shown to arise out of and in the course of the employment as set forth in this section.</u>

This definition is based on medical research of repetitive stress injuries. Note that certain conditions that arguably could fall within the ambit of "repetition" are not included, such as mental conditions (for example caused by repetitive exposure to stressful situations), abrasions (for example caused by repetitive rubbing), and injuries from repetitive exposure to extreme temperatures. The specific language of H.B. 617 was "injuries caused by repetitive motion" and not repetition generally. We did include "noise" which is not a repetitive motion, but this is intended to continue to include hearing loss as a covered condition. Additionally, conditions relating to the neck, back, and spine, which are currently excluded from coverage as an occupational disease, are discussed in the Policy Considerations section below.

Next, how should the statute be structured, to ensure that occupational conditions are covered, and injuries caused by non-occupational conditions are excluded? As discussed earlier, despite being covered conditions, the frequency of claims for hearing loss and carpal tunnel syndrome in Virginia is significantly lower than in other states sampled.[23] This, we believe, is likely due to the heightened burden of proof set forth in the ordinary disease of life section of the Act, in addition to the requirement that it be clearly and convincingly shown that the condition did not result from causes outside of the employment. Given the objective to *allow* coverage for injuries caused by repetitive motion, it appears that these current constraints on coverage also need to be modified. It is important to balance this objective, however, with that of *not* covering non-workplace injuries.

Currently, the approach used in § 65.2-401 is to require a certain level of proof; the focus is on the technical sufficiency of evidence. The purpose of the statute, however, is to ensure that the disease arose out of and in the course of the employment. A single, clear medical opinion by a treating physician can establish causation. Medical evidence that all reasonable causes are known and have been considered, including the employment-related causes, and that, on balance, employment is considered the principle, or primary cause of the disease, considering all causes, would accomplish the purpose of the statute. This would be accomplished by further defining the causation standard in § 65.2-400(A) as follows (new text from above version underlined):

> [T]he term "occupational disease" . . . specifically includes injuries from conditions resulting from physical stressors including repetitive and sustained motions, exertions, posture stresses, contact stresses, vibration, or noise. Repetitive and sustained physical stress is not required to occur over a particular period, so long as such a period can be reasonably identified and documented<u>, and further provided that the employment is shown to have primarily (more than 50%) caused the injury, considering all causes</u>. Notwithstanding prior decisions to the contrary, such injuries shall be covered injuries if shown to arise out of and in the course of the employment as set forth in this section.

This is based roughly on a 2015 change to the Tennessee workers' compensation laws.[24]

Some RSI conditions present unique challenges to medical providers and fact finders in determining causation. States vary in how they address this issue. The approach outlined above allows medical providers to weigh the relative contribution of occupational causes against all other causes of an injury. Moreover, in the Policy Considerations section, we discuss the potential for adopting standards that could be followed by treating physicians in assessing causation. These standards go a long way in clarifying and confirming the relative contribution of work versus all other causes. This could be the subject of rulemaking and provide consistency with how more difficult causation analyses can be addressed.

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[23] Carpal tunnel syndrome represents 0.4% of claims across the nation; in Virginia, however, these claims are 0.06% of all claims. Thus Virginia's rate is roughly 6.5 times lower than that in other states.

[24] The "primarily" standard in Tennessee is defined as requiring that the "employment contributed more than 50 percent (50%) in causing the injury, considering all causes." The effect of this definition is that it is mathematically impossible to have more than one "primary cause." Tenn. Code Ann. 50-6-102.

Additionally, we suggest that this option – amending the occupational disease provisions to add coverage for RSI – should be accompanied by further changes to the occupational disease and ordinary disease of life sections. The occupational disease section is confusing, contains superfluous language and overlapping provisions, and operates to exclude many conditions primarily caused by work. The overall rate of occupational disease in the U.S. is very low, but the Virginia rate of acceptance of a general category of occupational disease is 28% lower than the national rate.[25] As for the ordinary disease of life section, not only does the standard of proof require a very strict burden of proof of a causal connection with work as just outlined, the section also requires proving that there were *not* any non-occupational factors that contributed to the condition. Such a standard seems to require tremendous difficulty in showing that possible or potential causes played no role; it defies logic, for example, to conclude that playing tennis for exercise plays absolutely no role in a meat cutter's lateral epicondylitis (medical terminology for tennis elbow). This change is consistent with Virginia court decisions, which have held that establishing only a single cause is not required. Details for these additional changes are provided in the Summary section below.

Finally, the occupational disease section specifically excludes injuries to the neck, back, and spinal column. It is important to recognize that, while RSI are a relatively infrequent occupational injury, they can involve neck and back conditions. Thus, if the General Assembly determines to include all potential RSI in expanding coverage, it should address the neck and back exclusion. There are other factors in making such a change, however, and we discuss this in the Policy Considerations section below.

B. Option: Amend the Injury Definition

Other than amending the occupational disease provisions, the alternative option is to amend the definition of injury. Virginia Code § 65.2-101 defines an "injury" as an "injury by accident arising out of and in the course of the employment." As outlined previously, the Supreme Court has held this definition to exclude repetitive stress injuries.[26] This definition could be amended, however, to specifically include repetitive stress injuries, or a provision could be added that would prevent a defense that an injury is not compensable because it was a repetitive stress injury that otherwise meets the definition of an injury. For the following reasons we believe that such a change could have consequences beyond simply covering repetitive stress injuries, however, because the definition of injury is a key term used in numerous other provisions throughout the Act.

First, the precise triggering event for notice and the statute of limitations can be difficult to discern in such injuries. Symptoms could be mild at first, and it might not be obvious what is

[25] Analysis of 2014-18 average paid claim data as of September 2020, using WCIO Nature of Injury code 71 (All other occ disease injury NOC).

[26] *Jemmott*, *supra*, 251 Va. at 199 (1996) ("[J]ob-related impairments resulting from cumulative trauma caused by repetitive motion, however labeled or however defined, are, as a matter of law, not compensable under the present provisions of the Act.").

causing them. This is similar to an occupational disease, which tends to surface gradually. For occupational diseases, the triggering event is either "diagnosis of the disease" or "last injurious exposure."[27] If expanding coverage of RSI were handled as an "injury" than similar triggering event language should be added. Additionally, if RSI were added as an "injury" then hearing loss and carpal tunnel syndrome would most likely also be considered repetitive stress injuries; however, these conditions are currently set forth in the occupational disease and ordinary disease of life provisions of the Act. This would need to be addressed to add clarification and prevent litigation.

Finally, modifying the definition of "injury" to accomplish coverage of repetitive stress injuries could have unintended consequences with respect to injuries from "unknown" causes. For example, litigation has focused on how singular an event or series of events must be, to be considered a "sudden, identifiable incident." These cases typically involve an injury happening at work, but the evidence is not clear as to when, resulting in an injury stemming from a somewhat "unknown" cause. There are cases where four hours of exertion falls within the definition but even shorter periods of exertion do not. Modifying the definition of injury to include repetitive stress conditions could unintentionally result in a broader expansion of coverage of injuries from "unknown" causes.

C. Recap of Options

The basic alternatives for expanding RSI coverage are: 1) amend the definition of injury; or 2) amend the occupational disease section. For the latter alternative, there are additional options for modifying the causation standard. These options are: 1) maintain the status quo regarding the weight of evidence and continue to use the clear and convincing standard; or 2) adopt a less restrictive causation standard, for example "primary (more than 50%) cause considering all causes." Finally, there are also options that should be considered, namely whether to include conditions of the neck, back, and spinal column as RSI. A high-level overview of possible options to expand coverage for RSI in Virginia are as follows:

1. Add RSI as covered conditions in the occupational disease/ordinary disease of life sections but retain the current structure of those sections;
2. Add RSI as covered conditions in the occupational disease/ordinary disease of life sections with accompanying amendments to the general structure of those sections;
3. Add RSI as covered conditions in the occupational disease/ordinary disease of life sections but remove the prohibition of coverage for conditions of the neck, back, or spinal column; and
4. Add RSI as covered in the definition of injury.

The first option involves adding RSI as an occupational/ordinary disease but retaining the current structure of those sections, including the restrictive burden of proof (clear and convincing evidence). This option would likely result in the fewest amount of additional injuries

[27] See Va. Code § 65.2-406(A)(6).

being added to the system but would also likely result in increased litigation and exclusion of legitimate claims.

The second option – covering RSI as an occupational/ordinary disease with accompanying structural changes to those sections in the Act – involves specifying within those sections that RSI are covered, as well as modifying the general structure of those sections as well as the burden of proof. The occupational disease sections are overly complicated and difficult to apply, and result in too few conditions being covered, despite being work related.

The third option is to add RSI as an occupational/ordinary disease, and also to eliminate the current restriction place on neck and back injuries within that section. Although RSI typically involve upper extremity injuries, it is not unusual for employees to suffer neck and back injuries as the result of gradual, repetitive motions and stresses. These types of injuries present additional challenges with respect to causation and share commonalities with conditions experienced by the public generally. This option also carriers a higher risk of litigation as well as a higher risk that non-occupational injuries will be shifted to the workers' compensation system.

The fourth option is to amend the definition of injury by accident to include RSI. This effectively would place such injuries in the realm of "traumatic" injury. Courts have long used this definition, however, to avoid covering gradually incurred injuries, instead requiring proof of a single, identifiable incident. This option has a higher risk of spurring litigation and instability in the law, as other provisions in the Act rely on this interpretation of an injury, for example notice requirements and statute of limitations. It also potentially invites litigation over injuries of "unknown causes."

We now turn to public policy considerations involved in these options followed by an analysis of risks of negative and unintended consequences. We conclude with a classification of the options according to their respective likelihood of experiencing these consequences.

VII. Policy Considerations

There are additional policy considerations relevant to expanding the Virginia workers' compensation system to include repetitive stress injuries. These impact the policy considerations in adding coverage for RSI.

A. Neck and Back Injuries

We first discuss Virginia's current exclusion of back, neck, and spine conditions as occupational diseases. A decision to *include* RSI as occupational diseases brings this back/neck/spine exclusion into question. Gradually developing back, neck, and spine conditions can present unique difficulty in identifying causation with much certainty. (This may be more complicated than causation for repetitive stress injuries generally.) The disease provisions of the Act specifically exclude neck and back conditions, probably for this reason. Repetitive stress injuries

fall in a grey area, where rigid, precise injurious action can be hard to pinpoint.[28] Moreover, the boundary between "disease" and "injury" in many instances is not abundantly clear, hence the use of vaguer terms like "syndrome" or "condition." What is clear, however, is that one can injure his or her back by repetitive bending, lifting, carrying, or even standing still in one position. Whether this is caused by work activities or activities outside of work is a source of frequent debate and litigation. Despite these difficulties, qualified medical professionals are able to identify the likely cause(s) of a back or neck malady.

In addition to work related causes, back and neck injuries are also clearly precipitated by age, obesity, and other personal risk factors. Such arguments matter little to an individual who is unable to bend over to tie their shoes or to an employer required to pay for an employee's back surgery. Regardless, the Act's current definition of an occupational disease excludes "any condition of the neck, back, or spinal column."[29] It would be incongruous to include such conditions as meeting the definition of a repetitive stress injury, but to exclude them generally as an occupational disease. But including them as covered RSI adds risk that some conditions that are more connected with non-work factors are covered as work related. Also, neck and back injuries are more expensive to treat than most injuries.

It appears that the tension in covering back and neck injuries as diseases results from the origin of some such injuries being relatively unknown. For example, the injury could be from any number of causes, and no specific cause is identified with much certainty. We believe that this is best addressed through a clear causation standard, by which treating physicians review both work and non-work factors and the best available medical evidence to arrive at reasonable causation conclusions. In summary, the crux of the public-policy issue concerning whether to include neck and back injuries as covered occupational diseases, is one of added cost to the system weighed against the risk of adding costs to the system that are not truly work related along with possibly more litigation.

B. Occupational Disease Cases

If the General Assembly determines to amend the occupational disease provision of the Act to add coverage for RSI, then there are additional, pertinent consideration about that section generally that could impact the change. In Virginia there are two pertinent sections: occupational diseases and ordinary diseases of life, and all "diseases" first go through the occupational disease provision.

Proving an occupational disease in Virginia involves addressing several causation questions. First, an occupational disease cannot be one "to which the general public is exposed outside of the employment." Second, there is a multi-part causation analysis, requiring the following: a

[28] See, e.g., Rempel, David M., et al., "Effect of Wrist Posture on Carpal Tunnel while Typing," Journal of Orthopaedic Research (Mar. 26, 2008); *see also* Leach Scully, J., "What is a Disease?", Science and Society (July 2004) ("It might not be easy to articulate what a disease is, but we like to think we would at least all know when we saw one.").
[29] Va. Code § 65.2-400(B)(4).

"direct" link to work; "natural" connection with the nature of the work; a "fair" trace to the work; no "substantial" non-work exposure; not a condition of the neck, back, or spine; "incidental to the character of the business"; not independent of an employer and employee relationship; and flowing originally as a natural consequence from a risk connected with the work.[30]

If the disease *is* one to which the general public is exposed outside of the employment, then it may still be treated as an occupational disease. These are known in the statute as "ordinary diseases of life." They have several additional causation questions, and must be established by "clear and convincing evidence (not a mere probability)" as follows: that the disease exists and arose out of and in the course of the employer as provided for occupational diseases; that the disease did not result from causes outside of the employer; and one of the following: (i) it follows as an incident of occupational disease; (ii) it is a certain type of infectious or contagious disease; or (iii) it is characteristic of the employment and was caused by conditions peculiar to the employment.[31]

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[30] Virginia Code § 65.2-400 provides as follows:

> A. As used in this title, unless the context clearly indicates otherwise, the term "occupational disease" means a disease arising out of and in the course of employment, but not an ordinary disease of life to which the general public is exposed outside of the employment.
>
> B. A disease shall be deemed to arise out of the employment only if there is apparent to the rational mind, upon consideration of all the circumstances:
>
> > 1. A direct causal connection between the conditions under which work is performed and the occupational disease;
> >
> > 2. It can be seen to have followed as a natural incident of the work as a result of the exposure occasioned by the nature of the employment;
> >
> > 3. It can be fairly traced to the employment as the proximate cause;
> >
> > 4. It is neither a disease to which an employee may have had substantial exposure outside of the employment, nor any condition of the neck, back or spinal column;
> >
> > 5. It is incidental to the character of the business and not independent of the relation of employer and employee; and
> >
> > 6. It had its origin in a risk connected with the employment and flowed from that source as a natural consequence, though it need not have been foreseen or expected before its contraction.
>
> C. Hearing loss and the condition of carpal tunnel syndrome are not occupational diseases but are ordinary diseases of life as defined in § 65.2-401.

[31] Virginia Code § 65.2-401 provides as follows:

> An ordinary disease of life to which the general public is exposed outside of the employment may be treated as an occupational disease for purposes of this title if each of the following elements is established by clear and convincing evidence, (not a mere probability):
>
> 1. That the disease exists and arose out of and in the course of employment as provided in § 65.2-400 with respect to occupational diseases and did not result from causes outside of the employment, and
>
> 2. That one of the following exists:
>
> > a. It follows as an incident of occupational disease as defined in this title; or
> >
> > b. It is an infectious or contagious disease contracted in the course of one's employment in a hospital or sanitarium or laboratory or nursing home as defined in § 32.1-123, or while otherwise engaged in the direct delivery of health care, or in the course of employment as emergency rescue personnel and those volunteer emergency rescue personnel referred to in § 65.2-101; or
> >
> > c. It is characteristic of the employment and was caused by conditions peculiar to such employment.

These several questions and conditions have areas of overlap. In the leading treatise on workers' compensation law, Virginia is characterized as having the "most elaborate statutory definition" for occupational diseases.[32] Our interviews with stakeholders confirmed that it can be unusually difficult for medical providers and adjusters to work through these questions. The Larson treatise goes on to describe the Virginia statutory framework for occupational diseases as follows:

> Virginia has a story all its own in its attempt to distinguish between occupational diseases and ordinary diseases of life. Despite some efforts to soften the blow of early decisions on the issue, the state continues to maintain its position of having the most restrictive view of compensability for these types of claims.[33]

Other states handle occupational disease claims with a similar list of causation questions. For example, Indiana has an almost identical definition. Injuries caused by repetitive motion, however, are covered in Indiana as an injury by accident, not an injury by disease.[34] Tennessee had an occupational-disease statute that was similar to Virginia's until 2015, when the state shifted to a single causation test for both accidental and disease injuries.[35] The state now uses a "primary cause" definition. Other states similarly use a "prevailing" or "major contributing" standards to evaluate causation.[36]

North Carolina is an example of a state that uses a list of diseases that can qualify for coverage. The list includes certain injuries caused by repetitive motion, including "Bursitis due to intermittent pressure in the employment," "Synovitis, caused by trauma in employment," and "Tenosynovitis, caused by trauma in employment," and there is a "catch all" provision for other conditions, but these exclude "all ordinary diseases of life to which the general public is equally exposed outside of the employment."[37] This may explain why the frequency of RSI in North Carolina is comparatively lower than that across the country. Virginia similarly used a list of qualifying disease conditions from 1944, when it first enacted coverage for occupational diseases, until 1970.[38]

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[32] 4 Larson, Arthur et al., Larson's Workers' Compensation Law § 52.03 (Bender, Rev. Ed. 2020).
[33] *Id.*
[34] Indiana Code § 22-3-7-10; *see* Union City Body Co. v. Lambdin, 569 N.E. 2d 373 (Ind. Ct. App. 1991).
[35] Note that WorkComp Strategies participated in an analysis of the Tennessee workers' compensation system in 2012 and made recommendations to clarify the causation standard. The analysis found that there were inconsistent interpretations of the standard and concerns over accepting conditions as occupational that were the result by non-work causes, including introduction of a "could have caused" standard by Tennessee courts. In 2013, the Tennessee Legislature enacted reforms to the Tennessee system which, among other things, tightened the causation standard; the "arising primarily" standard for repetitive motion conditions was in place prior to the analysis or reforms.
[36] *See, e.g.*, Mo. Rev. Stat. § 287.020(3) (prevailing factor); Or. Rev. Stat. §§ 656.005 & -802 (major contributing cause).
[37] N.C. Code § 97-53.
[38] See Scott, Eliz. V., *Workers' Compensation for Disease in Virginia: The Exception Swallows the Rule*, 20 Univ. of Rich. Law Rev. 161, 166-67 (1985). When Virginia added coverage for diseases, it adopted the six-part test and the schedule of covered diseases. The General Assembly removed the schedule in 1970 but retained the six-part test. The source of the six-part test is traced to a 1918 Massachusetts decision concerning compensability of a deadly

An additional aspect to understanding occupational-disease coverage is whether a pre-existing disease can be covered by workers' compensation. Discerning causation in such situations is problematic. A latent, asymptomatic condition could be aggravated by work activities and become symptomatic and disabling, whereas symptoms of a condition that pre-dated employment could continue to be experienced after beginning, but not made any worse by the employment.[39] Virginia courts have taken the approach in such "aggravation" cases that, if the aggravation results from a traumatic accident, then it is covered, but if it results from a disease, then it is not covered. The six-part occupational-disease test requires that the "origin" of a disease be a "risk connected with the employment," thus by definition the origin of a pre-existing disease cannot be the employment because it pre-dated the employment.[40] Among the other two states that use the six-part test, Illinois provides by statute that a work-related aggravation of a disease is a covered occupational disease, and in Indiana an aggravation of an ordinary disease of life is covered if caused by an otherwise covered injury or occupational disease.[41]

The obvious purpose of these various approaches to evaluating causation is to restrict coverage to cases where an injury is caused – to a reasonable degree – by the employment. This restriction is central to the operation of all workers' compensation systems, namely that an employer is not liable at common law for an employee's workplace injury, but an employee receives benefits under the workers' compensation system for a workplace injury, regardless of the employee's fault in causing the injury. This is known in workers' compensation as the "great compromise." The relevant, key phrase is *workplace injury*. In other words, the compromise hinges on whether the work caused the injury, which in Virginia and most workers' compensation systems is expressed in statute as "arising out of and in the course of the employment."[42] This is how the scope of the employer's obligation is confined in workers' compensation systems.

Occupational diseases, however, like repetitive stress injuries, fall into a type of injury for which causation is difficult to discern, which is particularly the case in conditions that arise not strictly within a particular employment context (e.g. coal miner's pneumoconiosis) but among the general public (e.g., lateral epicondylitis, often referred to as tennis elbow). Virginia chose to

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assault at the hands of a co-worker, and in Virginia to a 1938 decision concerning the compensability of a death caused by a fall from a moving vehicle.

[39] For example, a diagnosis of carpal tunnel syndrome could pre-date employment. There could be evidence that the condition was not active, symptomatic, or disabling until beginning the employment versus evidence that the employment was not a significant factor in the symptoms. *See, e.g.*, *Cavuto v. Safeway, Inc.*, 2009 Va. Wrk. Comp. Lexis 1429 (2009).

[40] *See, e.g., Ashland Oil Co. v. Bean*, 225 Va. 1 (1983) (denying compensation for the disabling condition of bursitis of the foot caused by a store clerk's use of certain shoes and frequent standing at work, when the condition resulted from inflammation of a bunion on the foot that pre-dated the employment).

[41] 820 Ill. Stat. 310/1(d); Indiana Code §§ 22-3-6-1(e) & -7-10(a).

[42] "The statutory phrase 'arising out of and in the course of the employment,' which appears in most workmen's compensation laws, is deceptively simple and litigiously prolific." *Cardillo v. Liberty Mut. Ins. Co.*, 330 U.S. 469, 479 (1947) (citation omitted).

address this difficulty by limiting coverage of any "ordinary disease of life to which the general public is exposed outside the employment." As originally enacted, there was no definition for an "ordinary disease of life to which the general public is exposed outside the employment." Instead, there was a schedule of "diseases and conditions" that were "deemed to be occupational diseases" provided that they were shown to be "occupational."[43] Included in the schedule were illnesses like cataracts due to exposure to molten glass heat and glare and ulceration due to exposure to in industrial slaughtering or processing of livestock and hide-handling, as well as more "ordinary" conditions like tenosynovitis, bursitis, epicondylitis, cellulitis, dermatitis, and "disability due to exposure to radioactive substances and X ray." The schedule was eliminated in 1970, and occupational diseases were assessed based only on the six-part test.[44] The reported purpose of this change was to "insure the most comprehensive coverage of occupational diseases."[45]

Thereafter, judicial interpretations evaluated disease claims on whether they met the definition of an occupational disease, i.e., arose out of and in the course of the employment, and if not, then they were a non-compensable ordinary disease of life.[46] The question of causation was not the susceptibility of the general public to the condition, but whether the particular employment exposed the employee to a higher risk of developing the condition. Thus, for example, claims for occupational tenosynovitis, arguably a condition that can develop in a non-work context, were allowed so long as the causal connection with work was established. This was bolstered by the fact that tenosynovitis was listed in the schedule of covered diseases in Virginia dating back to 1944.

To recap the law on diseases from 1944 through 1970: Virginia used a six-part test for occupational diseases, and excluded ordinary diseases of life. It also established a statutory schedule of "diseases and conditions" pursuant to which more "ordinary" illnesses were covered, so long as they were also shown to be occupational. In 1970 the schedule was repealed to offer a broader, more general coverage for occupational diseases, provided they were established as arising out of the employment.

The Virginia Supreme Court, however, rejected this approach in its 1985 decision in *Western Electric Co. v. Gilliam*.[47] The Court shifted the test of whether a disease was "ordinary" from an analysis of the employment to an analysis of the general public. The Court cited a 1984 decision involving a back strain, which was similarly not covered, and reasoned that "in terms of cause of effect, we find no legally sufficient difference between Yancey's back strain and Gilliam's tenosynovitis."[48] In effect, if the condition is "ordinary" then it is not compensable, regardless

[43] *See* Va. Code § 65.1-47 (1968).
[44] 1970 Acts of Assembly Ch. 470.
[45] Report of the Virginia Advisory Legislative Council, Matters Pertinent to the Industrial Commission of Virginia and Workmen's Compensation Laws of Virginia, Va. H. Doc. No. 17, at 5-6 (1969).
[46] Two limited statutory exceptions were if a non-compensable occupational disease was caused by a compensable occupational disease and if an infectious or contagious disease contracted in the course of hospital work.
[47] 229 Va. 245 (1985).
[48] *Id.* at 247 (*citing Holly Farms v. Yancey*, 228 Va. 337 (1984)).

of whether the employment caused it. The Court was not persuaded by the argument that the 1970 expansion of the Workers' Compensation Act should not be interpreted to reduce coverage for the previously covered condition of tenosynovitis, but invited the General Assembly to act if it disagreed.

The General Assembly did disagree, and in 1986 enacted changes to the occupational-disease provisions which appeared directed, at least in part, to overturning the *Gilliam* decision. The critical element in defining the compensability of an "ordinary" disease shifted to whether the disease was "characteristic of the employment and was caused by conditions peculiar to such employment." Two important exceptions, however, were also included: 1) neck, back, and spine conditions were excluded from coverage; and 2) ordinary diseases of life were subject to a "clear and convincing" burden of proof. Thus, conditions like tenosynovitis would be covered, provided they met the clear and convincing standard. Such claims were accepted, but litigation resisting such claims eventually led to the Supreme Court's decision in *The Stenrich Group v. Jemmott*, which held that conditions like carpal tunnel syndrome and tenosynovitis, as gradually incurred traumatic injuries, did not result from a single, identifiable incident and thus were not covered by workers' compensation.[49]

To summarize the evolution of Virginia law concerning injuries caused by repetitive motion:

- They were not covered when the Virginia Workers' Compensation Act was first enacted;
- In 1944 they were covered by statute if they were listed on the disease schedule;
- In 1970 the schedule was eliminated and they were covered by statute;
- By 1985 they were not covered according to judicial interpretation;
- In 1986 they were covered by statute unless they were a neck, back, or spine condition;
- By 1996 they were not covered according to judicial interpretation;
- In 1997 only the single listed condition of carpal tunnel syndrome is covered;[50]
- In 2020 H.B. 617 directed the study of broadening coverage to add injuries caused by repetitive motion.

For these reasons, it would appear that changes to the occupational disease and ordinary disease of life sections are needed to ensure that coverage for RSI is added in a way that ensures work-related injuries are covered and non-work related injuries are not covered. We provide suggested changes in the Summary section below. We also believe that, given the complicated history of changes to the occupational disease sections, particularly with respect to RSI, further changes to broaden coverage should clearly state that past court decisions notwithstanding, RSI are a covered condition in Virginia.

C. Method for Determining Causation

As noted, establishing occupational causation is more challenging in RSI cases. There is, however, a well-established methodology for making medically sound determinations of

[49] 251 Va. at 186 (1996).

[50] Hearing loss is also covered but is not caused by "motion" but by repetitive exposure to noise. In presenting options for change, we include "noise" as one of the contributors to covered repetitive stress injuries.

causation even for RSI cases. This standard is well recognized and accepted by occupational medicine specialists, but not widely adopted by general practitioners. Reports from interviews with occupational medicine specialists were that it is not always clear from reviewing reports of treating physicians whether their determinations of causation are founded on any of the steps in this process. In fact, many physician reports of injury are summary statements of opinion.

We recommend further consideration of the NIOSH/ACOEM[51] six-step process for assessing causation, which could be established as the normative process for credibly making such determinations. It would be very helpful to claim adjusters if they are provided with medical reports that evidence following such a process. This would establish credible evidence of causation that should help prevent litigation. Such a process could be adopted through rule-making, allowing input from medical providers and claims specialists in structuring the format of such reports, as well as allowing for an addition to the fee schedule for providing this documentation.

In making a change such as adding RSI, reducing unpredictable results is important to ensuring broad acceptance and a smooth transition. As frequently noted in this report, causation is typically the main issue involved in managing occupational disease claims generally, and RSI claims specifically. We suggest that adopting guidelines for determining causation would help provide this level of predictability, as well as likely reduce the negative impact caused by adding non-work injuries to the workers' compensation system.

VIII. Risk of Negative Consequences

In our analysis we have presented options for adding coverage for injuries caused by repetitive stress motion. These options range from those with the least expected impact to those with a greater expected impact. Understandably, policymakers and stakeholders are keen to understand the likely impact of broadening coverage for repetitive stress injuries on claim frequency and cost. The most direct way to quantify cost impact from adding RSI to the Virginia system is to estimate the number of new claims added by coverage of RSI and multiply this by the estimated average cost per RSI claim.

Such a change, however, involves more than simply quantifying anticipated benefit payments. There will be other indirect changes to the total cost of the system. An immediate change will be additional work for claim adjusters to obtain detailed medical evidence on the cause of the injury claim. Initially after a change such as adding coverage for RSI, there may be an increase in litigation as the boundaries of the law is tested (this will increase insurance premium and self-insurer costs because of higher loss adjustment expense). There may be an impact on the number of claims as workers and advocates learn about the expanded coverage. Coverage for RSI will add costs to employers; this creates an incentive to employ safety and loss control

[51] This process was originally published in Kusnetz and Hutchison, eds. DHEW, CDC, NIOSH, Pub. No. PB298-561 (1979). It was later adopted by the American College of Occupational and Environmental Medicine in Occupational Medicine Practice Guidelines, 2nd and 3rd Eds. ACOEM OEM Press, 2004, 2008, 2011. *See also* Hegmann, ed. ACOEM Occupational Medicine Practice Guidelines. 3rd ed. (Elk Grove Village, IL 2011).

measures. It will take time for employers and employees, respectively, to take measures to modify workplaces and to adhere to safer work practices that help prevent such injuries. Moreover, depending on how the change is implemented, either a fewer or greater number of covered claims should be expected. For example, removing the exclusion of neck and back injuries as covered occupational diseases will result in an increase in covered claims. We propose analyzing these impacts by assessing each option according to the risk of litigation; the risk of including non-work injuries; and the risk of excluding legitimate injuries.

A. Risk of Litigation

While parties to a claim may initially disagree on its handling, a dispute over workers' compensation coverage usually does not go to formal litigation if the outcome is predictable. The outcome will be reasonably certain if the law is clear and consistently enforced. Unlike many traumatic injuries (amputations, burns, broken bones), occupational disease claims have far more complexity and layers of inquiry that affect assessment of occupational causation. The law should establish workable guidelines for weighing these often-conflicting factors.

Doctors' reports are at the heart of claims handling decisions. The quality of initial reports of injury range from vague, incomplete statements of opinion to very thorough evidence-based conclusions. A superficial report for occupational disease causation is likely to generate follow up request by the claim adjuster. If the doctor fails to provide all the information requested, there is an increased likelihood of the adjuster setting up an independent medical exam (IME) to complete the medical assessment of the injury. Depending on the IME report, the adjuster may refuse further payment or accept and pay the claim.

Over-reliance on the use of IMEs is flawed. IME physicians are usually selected from among physicians that the adjuster hopes will share their perspective on how a claim of injury should be assessed. Some IME physicians have a track record of disputing occupational injuries, e.g., consistently finding that CTS symptoms are due to non-work causes. The claimant or his/her attorney in this situation would regard the IME report as biased and contest its findings. Far better to have the findings of the treating physician to be accepted by both parties. Parties to the claim may not like the opinion but conclude that it is not worth contesting.

This is not to say that the treating physician's report must be completely persuasive to the adjuster. But even should the adjuster find fault in the medical report, if the adjuster feels that the workers' compensation dispute system is likely to sustain that report as adequate in supporting work causality, the odds of going through the expense of litigation go down. In Virginia the treating physician typically is selected from a panel of physicians provided by the employer and adjuster. Effective use of panels can help reduce incomplete causation reports.

The risk of increased litigation over causality of RSI would be controlled by:

- The clarity and specificity of the legal standards and burden of proof;
- The consistency of case law that interprets these standards in actual claim situations;

- The ability of claim adjusters to get information from treating physicians that they feel is necessary to make a causation decision, as well as continued use by adjusters of qualified panel physicians; and
- Educational efforts by the Commission to help doctors understand the standards for determining causation and the adjuster's right to ask for such information.

If these factors worked to support rigorous and clear medical reports on causation, the risk of litigation is low. If, however, adjusters are frustrated in getting the sort of information detailed in the ACOEM six-point process (described generally above; details in the Appendix), the litigation risk is moderated. It is inevitable that a major change in the compensability standards will be initially tested through litigation. The boundaries of the new law need to be tested against actual cases. The persistence of litigation after the initial testing of the law in early disputes, however, will be higher if judicial decisions are inconsistent or unpredictable.

B. Risk of Covering Non-work Injuries

There are many "personal risk factors" that can contribute to symptoms associated with RSI, such as:

- Age – older workers are more likely to experience conditions like CTS, bursitis and shoulder injury;
- Gender – women are more susceptible to RSI type injuries;
- Weight – obesity can lead to joint and muscle problems and difficulty healing from injury;
- Smoking – heavy smokers have more problems with joints and discs in the spine;
- Arthritis – a contributing factor to joint injury;
- Activity Level – persons with sedentary lifestyles are more prone to RSI injury; and
- Other factors have been found to contribute to RSI symptoms.[52]

It is logical to ask: does the presence of one or more of the above risk factors rule out work as the primary cause of RSI symptoms? In general, the ACOEM six-step process would have the physician evaluate the gravity of these personal risks against the statistical risk of injury for particular job duties. For example, grocery clerks have a higher risk of back injury from standing or wrist injury from scanning and packing purchases. So even if a clerk with RSI symptoms has poor posture or is of retirement age, the doctor may find that the job duties were the primary cause of injury. Standing in place for hours or continually turning your wrist holding heavy objects is not a typical activity of daily living. Finally, the six-step process includes referring to the best available epidemiological evidence on the degree to which personal risk factors contribute to a given condition, e.g., gender differences in carpal tunnel syndrome are significant.

Another factor outside of work that can explain RSI symptoms is the routine practice of certain risky activities that could have induced the injury, such as are present in recreation, hobbies, or

[52] The American Medical Association has published guidelines to assist with weighing personal risk factors associated with specific injuries. *See, e.g.*, Melhorn, J.M. et al., *AMA Guides to the Evaluation of Disease and Injury Causation* (2014) at 134 (spine injury) & 295 (carpal tunnel syndrome).

second jobs. For example, guitar players can suffer RSI injuries to their hands and fingers, motorcycle or bike riders can develop carpal tunnel symptoms, and sports activities can cause "tennis" or "golfer's elbow."

This risk of covering non-work injuries under workers' compensation is partially controllable by having the standard for determining causation require that personal risk factors be identified and weighed by the treating physician against the stresses of the particular work done by the claimant. If adjusters can ask for and receive evaluations of personal risk factors, then the risk of covering non-work injuries is minimized. If, on the other hand, there is no inquiry into personal risk factors, especially personal pursuits of the employee outside of work, then the risk is higher that a number of injuries will be compensated even though personal factors outside of work are the dominant cause.

Additionally, employers currently have claims-handling mechanisms that allow claims to be investigated early, by qualified employer provided panels of physicians, to reach more accurate causation opinions. Moreover, post-employment-offer baseline employee physicals can help identify risks of injury. Finally, well-designed safety practices can help prevent losses, and establish that work-related causes of RSI are being actively addressed and controlled. Such practices can be designed with the advice of qualified medical experts, which can help prevent cases where injuries caused by factors outside of work are alleged to be work related.

C. Risk of not covering work-related injuries

Historically, workers' compensation only covered traumatic injuries occurring at a specific time and place. Some diseases were gradually recognized as work related. Lung disease and toxic chemical poisoning were added to coverage early, followed by a long list of other occupational diseases. In addition, coverage was extended to injuries that were subtle and not easily proven by objective medical evidence, e.g., a pulled muscle in low back that causes great pain but no objective evidence of muscle damage.

This extension of coverage for injuries caused by repetitive motion has become commonplace. Indeed, Virginia is the only state in the nation to deny coverage for RSI. If it is the will of the General Assembly to cover RSI, the standards for recognizing and accepting such injuries must be established with care. If the standard is too tight or restrictive, some bone fide work related injuries will not be compensated. As discussed previously, the standard for work causation can range from:

- Work as the sole cause
- Work as the primary cause
- Work as a contributing cause
- Work as a possible cause

Not only is the above range of work relatedness at issue, but also the method for establishing the connection to work. As in all workers' compensation systems, such inquiry must be done by physicians. But the rigor of the medical investigation (diagnosis, patient history, and job

analysis) and the quality of the reports is highly variable. Allowing for vague and unproven causation will increase coverage, while insisting on detailed evidence will in some cases remove coverage in which the physician fails to supply the information. Setting the bar for work relatedness and specifying it in statue and rule will determine the portion of injuries that are reasonably due to work and that receive compensation. This is a policy decision beyond the scope of medical fact finding.

An important consideration in analyzing the risk of not covering legitimate work injuries is shifting responsibility for the impact of such injuries from employers to employees and to the public generally. The obvious direct consequence is that the cost is borne not by those responsible for the harm. Studies estimate that over one-half of the total medical costs of occupational injuries are not paid by workers' compensation but through other private and public sources such as private health insurance, including almost 10% by workers directly.[53] Beyond issues of fairness, this can disrupt natural incentives through market forces to minimize employment practices that can lead to injury and increased cost. For example, when employers with unsafe work practices are required to pay increased premiums, this can serve as an economic incentive to modify practices and promote workplace safety.

Thankfully, the frequency of workplace injuries has been steadily declining in recent decades. Research shows, however, that occupational hazards continue to be a significant source of illness worldwide.[54] This is particularly true in less apparent disease conditions, which arise gradually and are more difficult to diagnose.

D. Summary of Risk Analysis

We have evaluated the options according to each of the risks outlined above. We have used a qualitative scale of "low/medium/high" to characterize risk levels. This is a rank ordering of risk, without any attempt to quantify the difference between medium and high or medium and low. This ranking of risk is an evaluative assessment of the authors, based on careful consideration of the experience of the workers' compensation system in Virginia and others throughout the country.

[53] *See* Leigh, J.P. and Marcin, J.P., *Workers' Compensation Benefits and Shifting Costs for Occupational Injury and Illness*, Journal of Occupational and Envir. Med. (Apr. 2012).
[54] *See* Rushton, L., *The Global Burden of Disease*, Current Envir. Health Rpts. (2017).

Table 1: Relative Weights of Risks of Negative Impacts for Each Proposed Option

Option	Description	Litigation Risk	Including Non-Work Injuries	Excluding Legitimate Work Injuries
Occupational Disease without Structural Change	Involves adding RSI according to the current structure and burden of proof of the occupational disease and ordinary disease of life sections	Medium	Low	High
Occupational Disease with Structural Change	Involves adding RSI along with amending the increased burden of proof for ordinary diseases of life and clarifying the causation requirements	Low	Medium	Low
Occupational Disease – unrestricted neck and back injuries	Involves adding RSI and also eliminating the prohibition against neck and back claims in the occupational disease section	Medium	High	Low
Injury by Accident	Involves adding RSI as a covered injury, by including RSI as a defined "injury by accident"	High	Medium	Low

According to this analysis, the second option – adding RSI as an occupational disease and adjusting the burden of proof – appears to involve the least negative risk among the options, and would have the most predictable overall cost impact. Other options would likely result in proportionate cost increases.

IX. Cost Impacts

In this section we set forth a range of cost possibilities from broadening coverage for RSI. This is founded on the baseline estimates for frequency and average cost per RSI claim added to the system. These estimates implicitly assume that: 1) Virginia will enact a law that follows the most common pattern in other states; 2) the enforcement of the law, especially with respect to litigation standards is typical of other states; and 3) the employment risk factors are similar to the average employment mix in the nation and Virginia employers follow the national pattern in lost prevention.

From this baseline estimate we have considered a range of scenarios to bound upside and downside cost possibilities. These scenarios are from judgmental adjustments to cost based on uncertainty about key assumptions. Among the assumptions considered are: 1) the changes in average medical cost in Virginia; 2) the rigor of medical causation determinations; 3) changes in litigation because of the new coverage.

Virginia's workers' compensation system costs about $1.1 billion in insurance premiums and about $500 million in cost to self-insured employers. These costs are made up of several components, including benefits paid to injured workers; charges paid to medical and other service providers; costs of handling claims, including attorney costs; insurance underwriting costs; self-insurance administrative costs; and other aspects of providing insurance and self-insurance. When evaluating impact from expanding coverage for RSI, "claim costs" are just one aspect to consider. In other words, "estimated average cost per claim" multiplied by "added claims from RSI" will only give a portion of the total overall cost impact on the system.

Understanding how a change in the workers' compensation laws of Virginia will impact overall system cost is quite difficult. There are myriad interactions between stakeholders that result from the operation of a workers' compensation system, including: injury prevention; injury reporting; access to appropriate medical care; prompt payment for lost wages; claims handling; attorney involvement; employer-provided modified duty; workplace accommodations; and services provided by the Commission. These highlight only the claim-related aspects of the system. Stable, predictable statutory and administrative environments and claim costs have a tremendous impact on overall system efficacy. Problems in any of these areas will impact overall system cost and operation, sometimes significantly. Of particular interest is litigation cost to the parties in the dispute and the Commission, which can burgeon if the statute and rules are not carefully crafted.

Some states, most notably California, have been caught in the turmoil of constant "reform" due to frequent changes, unnecessary manipulation of the system by certain interests, and high costs. Adding coverage for RSI in theory would impact only those employees at risk for occupational injury due to work involving repetitive motion, and if narrowly implemented would exclude burdening employers with claims for non-work conditions.

Using the frequency and cost estimates outlined earlier, we anticipate a system impact of approximately $20 million.[55] The frequency of RSI in Virginia is estimated to be 2.1% of total claims vs. the current frequency of 0.79%. We estimate approximately 1,200 additional claims, which are estimated to have a paid share of 2.5% of total cost vs. the current share of 0.55%. Average claim cost for RSI is estimated to be $17,000 vs. $15,050 for the overall average claim cost.

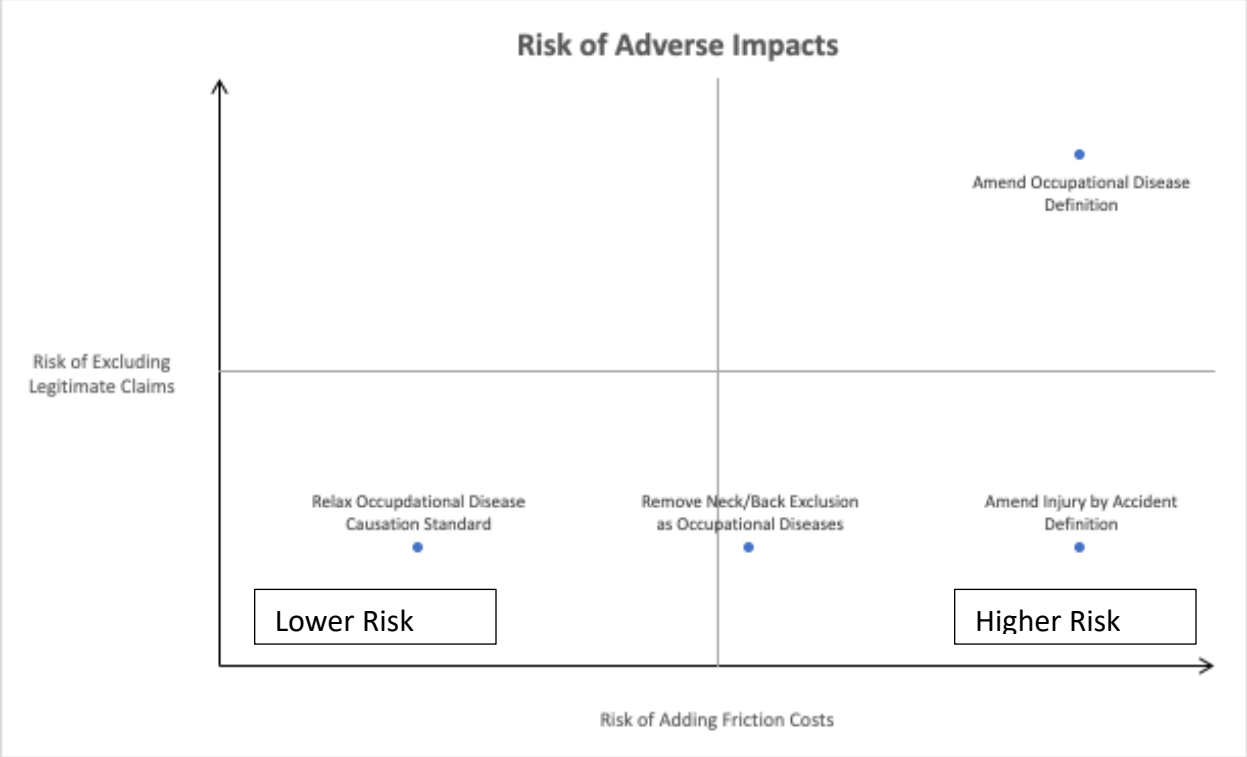
The four options for amending the Act to expand coverage for RSI are as follows:

1. Amend the occupational disease section and retain the current burden of proof;
2. Relax the causation standard used in occupational-disease claims;
3. Remove the exclusion of neck and back injuries as occupational diseases;
4. Amend the definition of injury by accident.

With respect to claims cost, they are presented here roughly in order of lowest to highest, meaning options 1 and 2 cover relatively fewer expected additional claims (and cost), and options 3 and 4 cover relatively more claims (and cost). Any expansion of coverage involves new claims and new costs and RSI is no exception. As described earlier, some approaches involve greater risk of uncertainty and increased litigation, which we refer to as “friction” cost. Moreover, the risk of excluding legitimate claims is a chief result of unnecessary friction. The risk of including non-work claims would be expected to have equivalent results. The figure below (also presented in the Executive Summary) illustrates the risk of each option of having adverse impacts on the system. The risk of added friction cost is on the x axis and the risk of excluding legitimate claims is on the y axis. The four options are placed into four quadrants based on their relative weighting on these two factors.

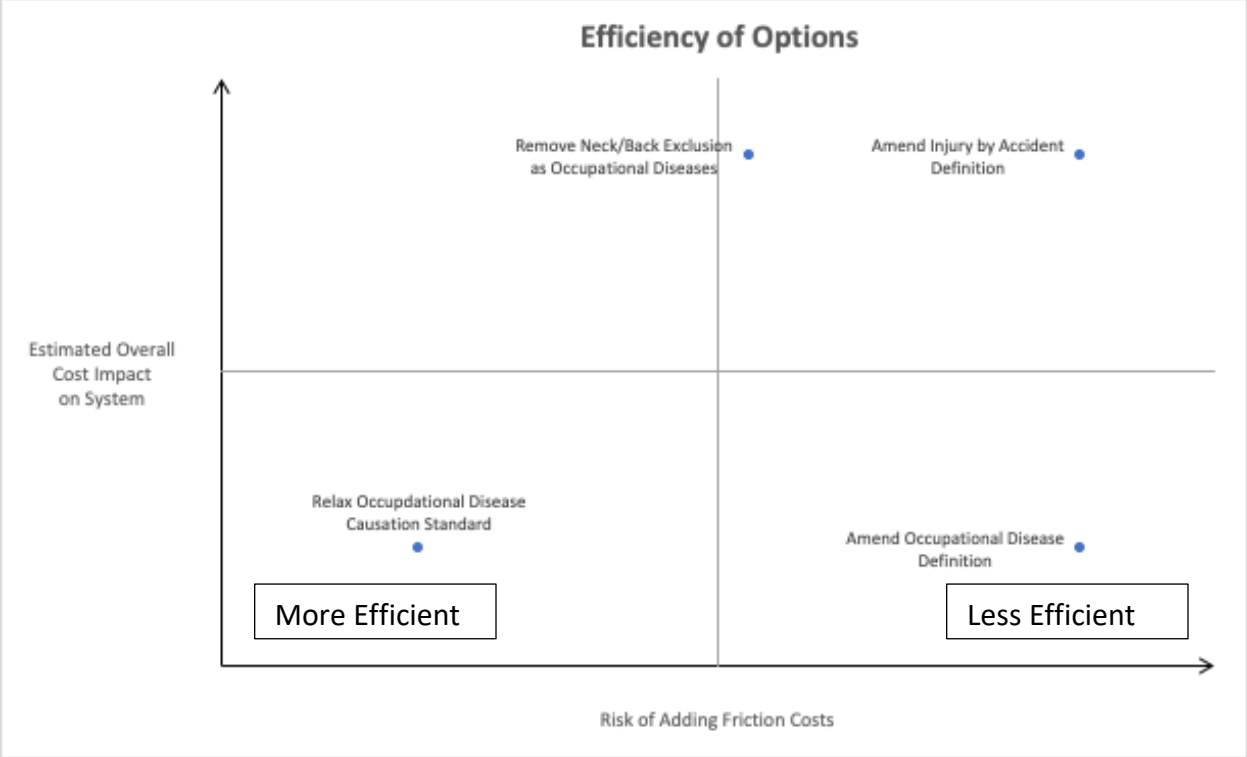
[55] This is calculated by multiplying the anticipated new claims by the total cost/claim. See the frequency and cost sections above for additional detail, as well as the Appendix.

Figure 5: Quadrants of Risk of Adverse Impact



Similarly, each option has a different estimated impact on the number of added claims. Estimated cost would directly correlate to claim frequency, but friction cost would increase out of proportion to claims added. This as a measure of efficiency, in other words, the less friction an option adds to the system, the more efficient it is in handling the increased claims from that option. The following figure (also presented in the Executive Summary) illustrates the expected efficiency of each option. The risk of additional friction costs is placed on the x axis and the estimated total cost impact is placed on the y axis. The top right quadrant would represent the highest risk of additional friction costs and the highest estimated total cost impact.

Figure 6: Quadrants of Efficiency of Options



X. Summary and Conclusion

This report has estimated a range of outcomes with respect to frequency and overall cost increase to the system. Employers would rightly expect some increase in claims and cost from broadening coverage for RSI. Some employers might worry that this "bump" in the cost of workers' compensation would be a continuing trend. This fear of continued growth in RSI claims frequency might stem from the rapid increase across workers' compensation systems in carpal tunnel syndrome and other repetitive motion claims in the 1980s and early 1990s. During those years, RSI injuries seemed to be an epidemic. Any keyboard use seemed to be provoking claims of carpal tunnel syndrome.

In recent years, medical research has cast light on the causes of RSI symptoms and how to avoid such injuries. Because of improved diagnosis and treatment of RSI and employer efforts to mitigate injury, the trend has been downward.[56] There are countless examples of automation reducing repetitive motion at work, e.g., nail guns have dramatically decreased RSI injuries in carpenters, robotics have eliminated much assembly line RSI injury, large data-entry keyboarding shops are a thing of the past. This is part of a larger trend in employer safety and

[56] NCCI reports an average annual decrease of between 5% and 10% for lost time claims involving occupational disease/cumulative injuries between 2013 and 2018. *State of the Line Report* (2020) (available at https://www.ncci.com/Articles/Documents/AIS2020-SOTL-Presentation.pdf).

job redesign. By way of perspective, the frequency of workers' compensation claims overall has declined 19 out of the last 20 years. Injury frequency reduction is likely to keep RSI injuries from substantial increase in the foreseeable future.

But similar to how employers would legitimately be wary of increased costs, employees are legitimately wary of making changes that do not result in legitimate occupational RSI being accepted and paid. This is highlighted by the current ordinary disease of life treatment of carpal tunnel syndrome; Virginia's rate of this injury is roughly 7 times lower than the average rate in other states. While there are many possible explanations for this, the likely explanation is that the ordinary disease of life provisions in the Act require a very high burden of proof, which results in legitimate claims for carpal tunnel syndrome related injuries being excluded from coverage.

In conclusion, we feel that there is a relatively low risk that RSI claims, over time, will be substantially higher than the percentage of total claims for RSI shown in the region around Virginia or nationwide. (Other states' RSI frequency is our basis for making cost projections for Virginia.) There is also a low risk that the rate of increase in RSI claims will see much increase in the future, based on the experience of other states. We anticipate that Virginia's experience would follow that across the country generally for RSI, namely that a 2.1% share of claims attributable to RSI would result in a cost increase such that RSI would account for 2.5% of total claim costs. Depending on how this is implemented, Virginia should not be greatly impacted by expanded litigation and inappropriate claims, with legitimate claims for RSI covered by the workers' compensation system.

XI. Summary of Potential Changes to the Act

The following changes to the Virginia Workers' Compensation Act could serve to accomplish the changes described in this report. In this presentation, removed text is struck; new text is underlined.

§ 65.2-101 (Definition of Injury)
"Injury" means only injury by accident arising out of and in the course of the employment or occupational disease including repetitive stress injuries as defined in Chapter 4 (§ 65.2-400 et seq.) . . .

§ 65.2-400 ("Occupational disease" defined)
A. As used in this title, unless the context clearly indicates otherwise, the term "occupational disease" means a disease arising out of and in the course of employment, but not an ordinary disease of life to which the general public is exposed outside of the employment, and specifically includes injury from conditions resulting from physical stressors including repetitive and sustained motions, exertions, posture stresses, contact stresses, vibration, or noise. Repetitive and sustained physical stress is not required to occur over a particular period, so long as such a period can be reasonably identified and documented. Notwithstanding prior court decisions to the contrary, such injuries shall be covered injuries if shown to arise out of and in the course of the employment as set forth in this section.
B. A disease or condition shall be deemed to arise out of the employment only if there is apparent to the rational mind, upon consideration of all the circumstances:
1. A direct causal connection between the conditions under which work is performed and the occupational disease or condition;
2. It can be seen to have followed as a natural incident of the work as a result of the exposure occasioned by the nature of the employment;
3. It can be fairly traced to the employment as the proximate cause;
4. It is neither a disease or condition to which an employee may have had substantial exposure outside of the employment, nor any condition of the neck, back or spinal column;
~~5. It is incidental to the character of the business and not independent of the relation of employer and employee; and~~
~~6. It had its origin in a risk connected with the employment and flowed from that source as a natural consequence, though it need not have been foreseen or expected before its contraction.~~
~~C. Hearing loss and the condition of carpal tunnel syndrome are not occupational diseases but are ordinary diseases of life as defined in § 65.2-401.~~

§ 65.2-401 ("Ordinary disease of life" coverage)
An ordinary disease of life to which the general public is exposed outside of the employment may be treated as an occupational disease for purposes of this title if each of the following elements is established ~~by clear and convincing evidence, (not a mere probability)~~:

1. That the disease exists and arose primarily (more than 50%) out of and in the course of employment as provided in § 65.2-400 with respect to occupational diseases, considering all causes ~~and did not result from causes outside of the employment~~, and
2. That one of the following exists:
a. It follows as an incident of occupational disease as defined in this title; or
b. It is an infectious or contagious disease contracted in the course of one's employment in a hospital or sanitarium or laboratory or nursing home as defined in § 32.1-123, or while otherwise engaged in the direct delivery of health care, or in the course of employment as emergency rescue personnel and those volunteer emergency rescue personnel referred to in § 65.2-101; or
c. It is characteristic of the employment and was caused by conditions peculiar to such employment.

XII. Appendix

[under separate cover]

WorkComp Strategies H.B. 617 Report: Appendix

Expanding Coverage of the Virginia workers' compensation system to include injuries caused by repetitive motion

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Figure 5: Average Share of RSI to All Claims 29

Appendix A: Disability Benefits in Virginia

In this appendix we examine the potential impacts from expanding coverage for RSI on Virginia's workers' compensation disability benefits system. Virginia is an "award state," meaning that disability benefits, once awarded, continue until the employer can establish that they should be stopped. Benefits can be stopped, absent circumstances such as an employee's refusal of treatment or to accept return to work accommodations by the employer, only when an employee's disability ceases, which means (in Virginia) that the employee has no actual loss of earnings.[1] Thus we will assess whether Virginia's being an "award state" serves to affect the overall fiscal impact of expanding coverage to include repetitive stress injuries. There is wide variation among states on how disability benefits are quantified, but it is more common that an employee is considered disabled until the employee's maximum medical improvement or impairment rating is established, meaning the employee has medically recovered, not necessarily to their pre-injury state, but to the point of medical stability.[2]

States that use the impairment approach will typically "rate the employee's impairment (if any) and close the claim." In Virginia (and some other states that base disability on loss of earnings), however, the claim stays open if there is wage loss, regardless of medical stability. Virginia has an overall cap of 500 weeks,[3] in addition to a cap on the weekly amount payable based on the average weekly wage of the Commonwealth.[4] The difference between the two approaches – impairment approach vs. wage-loss approach – essentially becomes a question of when a claim closes.[5] The longer a claim is open, the more costly it becomes. Thus, stakeholders assert that Virginia claims stay open longer due to increased difficulty in effectively closing them. The length of time a claim is "open" is referred to as claim "duration."

WCRI asserts, however, that the Virginia system has features that contribute to shorter claim durations:

- Stronger employer tools
  - Unilateral suspension of benefits permitted under many circumstances (pending a probable cause determination)
- Obligation on worker to minimize wage loss
  - Worker must seek/accept employment if released to light duty (if not on open award)

[1] This can also be established by showing that the employee is fully able to perform all aspects of pre-injury work. In other words, the employee is in the same position as immediately before the injury occurred.
[2] Medical stability does not necessarily mean full recovery, but instead that the employee has healed as much as medically possible from the effects of the injury and their medical condition has stabilized and no further treatment is required. Virginia and most states use the term "maximum medical improvement" to indicate that the claim has reached this status.
[3] The 500-week cap does not apply to permanent and total conditions, such as loss of both hands, arms, feet, legs, eyes, or a combination of the two; total paralysis; and severe brain injuries. See Va. Code § 65.2-503(C).
[4] This is based on information reported to the Virginia Employment Commission. In 2020 the maximum weekly compensation rate was $1,137. (http://workcomp.virginia.gov/documents/rates-min-max-benefits-cola-mileage)
[5] This is relevant to indemnity benefits only. Virginia, like most states, awards lifetime medical benefits.

- Worker must make reasonable effort to market remaining capacity to work even if partial return to work (if not on open award)[6]

Virginia compares favorably with other states in terms of overall claim costs and claim durations. The WCRI CompScope™ report on Virginia shows Virginia to be slightly above the median for claim durations among the 18 states included in the report. The WCRI report also compared Virginia with other wage-loss states, noting as follows: "Under a wage-loss benefit system, workers typically continue to receive temporary disability benefits so long as they experience wage loss because of the work-related injury. We expect states with a wage-loss benefit structure to have longer duration of temporary disability because most indemnity benefits are paid as temporary disability benefits." The study (which uses only claims with 7 or more days of disability) shows Virginia was significantly lower than three of the other wage-loss states in the WCRI study.[7]

Claim severity is another source of information about the nature of workers' compensation claim costs. The average severity of indemnity claims in Virginia is higher than the national average. NCCI reported that in 2017, average indemnity severity nationally was $23,900 compared to $27,900 in Virginia, a difference of 16.7%.[8] But indemnity severity is based on multiple factors, including the rate of benefits and method of calculation (permanent benefits are calculated in several unique methods depending on the state). Temporary indemnity is based on weekly benefits paid multiplied by duration of TTD disability. The weekly benefit is typically calculated as a percentage of an employee's pre-injury average weekly wage; most states (including Virginia) pay two-thirds of the employee's average weekly wage. But states also apply caps that serve to limit the maximum weekly amount. These caps vary widely across states. As of July 1, 2020, Virginia's maximum was $1,137 per week vs. a range between $505 per week in Mississippi and $1,686 in New Hampshire. The best way to compare Virginia's relative outcome in compensating temporary is to compare average length of temporary disability across all states. NCCI research published in 2013 showed that average temporary disability claim duration in Virginia was slightly below the national average.[9] Thus, the relatively high average indemnity paid in Virginia is not attributable to longer claim durations, but more likely to higher benefit amounts and higher average weekly wages of employees.

Switching to medical cost, Virginia medical costs per claim historically have been among the highest in the U.S. A 2018 report from WCRI, however, showed a 13 percent decrease in medical payments per claim between 2017-18, after adoption of a medical fee schedule in

[6] Quoted from WCRI, *CompScope™ Benchmarks for Virginia* (20th ed. Apr. 2020), at 22/slide 30.
[7] *Id*. at 22/slide 29
[8] NCCI, *State Advisory Forums 2019 (Virginia)* at 18 & 25. This includes all types of indemnity (temporary, permanent partial, permanent total, and fatal).
[9] NCCI, *Research Brief: Workers Compensation Temporary Total Disability Benefit Indemnity Benefit Duration – 2013 Update* (Aug. 2013) at 17 (measuring 2009 accident year claims at 36 months of development).

2018.[10] It should be noted that the number of treatments per claim and the sophistication (expense) of treatments also control average medical cost per claim. There is reason to believe that Virginia average medical costs are converging on the national average. Despite this positive development, average medical cost nationally has gone up around 10% between 2014-17.[11] In summary, cost and duration data is mixed, with some results showing Virginia being more costly per claim, while others show lower costs.

Insurance premiums in Virginia are lower than the national median. This is shown by the State of Oregon's biennial report on workers' compensation composite rates across the U.S. The October 2018 report had Virginia ranked as the 41st lowest state using standardized insurance rates (called the "index rate"), which was 75% of the median of all states plus the District of Columbia.[12] Thus, while data on claim costs in Virginia is mixed, the overall insurance costs are low.

A final note on the disability benefit structure in Virginia and its impact on system costs: In a 2000 report on permanent impairment approaches, Virginia was noted as a "wage loss" or "award" state, but the cost impacts from this structure were observed to be not significantly different from states using other approaches.[13] The report concludes its discussion on this issue as follows:

> Claims people unfamiliar with the wage-loss approach look at the possibility that the worker could receive benefits for many years or for life and assume it is a very costly system. In fact, it is ordinarily no more costly than other systems. This is because most claims are terminated with a lump sum settlement. . . . These lump sum payments frequently look very much like the permanent partial benefits paid in other states.[14]

With respect to lump-sum settlements, however, one important consideration is that Virginia does not pay permanent impairment benefits for neck or back impairment, except insofar is such an impairment results in a residual loss to an arm or leg. The practical effect of this is that chronic back claims would appear to be more difficult to close, or to require higher amounts offered in settlement, compared to other states. This same argument might be made for repetitive stress injuries, in that they share some common features with back conditions and could result in difficult-to-manage claims. Given that such conditions often involve an extremity (arm, leg, etc.), however, there should be fewer impediments to managing such claims to closure, as these would be subject to permanent impairment ratings and benefits.

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[10] WCRI, *CompScope™ Benchmarks for Virginia, 20th Edition (2020)* (https://www.wcrinet.org/news/press-releases/medical-payments-per-workers-compensation-claim-in-virginia-decreased-13-percent-after-fee-schedule-introduced-wcri-study-finds).

[11] NCCI, State of the Line Guide 2018 (available at: https://www.ncci.com/Articles/Documents/AIS2018-SOTL-Guide.pdf).

[12] The October 2018 report is available at https://www.oregon.gov/dcbs/reports/Documents/general/prem-sum/18-2082.pdf.

[13] Welch, Edward M., *Permanent Partial Disability Benefits*, Mich. State Univ. (2008). Welch uses the phrase "wage loss approach" to describe the Virginia system of being an "award state."

[14] *Id*. at 14.

In conclusion, in analyzing potential impacts for adding coverage for RSI to the Virginia system we have reviewed the basic structure disability benefits in Virginia and the associated cost results. As this analysis demonstrates, multiple factors are involved in profiling a state's workers' compensation benefits system: compensation rate; medical costs; and manner of compensating permanent loss. While Virginia's approach to disability benefits is somewhat unique, research indicates that this does not operate to contribute to making Virginia's system more costly. Adding RSI would definitely add claims and the costs for such claims to the system, but it does not appear that Virginia's structure as an "award state" would compound or increase the cost impacts from such a step.

Appendix B: Impacts on Claim Handling in Virginia

In this appendix we assess how expanding coverage for RSI would impact how claims are handled. As a general characterization, workers' compensation claims involve several basic steps, which are common across all systems: 1) report the injury; 2) evaluate coverage; and 3) provide appropriate benefits. Changing the Virginia Workers' Compensation Act to allow coverage for injuries caused by repetitive motion would affect each of these steps.

Injury Reporting

In Virginia, a workers' compensation "injury" includes both an "injury by accident" and an "occupational disease." Virginia law requires that an injury be reported to an employer "immediately on the occurrence of an accident or as soon thereafter as practicable." Va. Code § 65.2-600(A). For diseases, the employee must provide notice to the employer within 60 days "after diagnosis of an occupational disease is first communicated to the employee." Id. § 65.2-405(A). For repetitive stress injuries, amending the statute to allow coverage involves either amending the "injury" definition or amending the "occupational disease" provisions. If using the "injury" approach to cover RSI, the employee would need to notify their employer when they first become aware that an injury had occurred. This can present difficulties of proof, because such injuries may slowly develop, and it is difficult to know when it is in fact an injury. States who provide coverage using the injury approach solve for this issue by triggering the notice requirement based on when there was a diagnosis of an injury or when the condition became disabling.

For the "occupational disease" approach Virginia law provides an established mechanism for establishing the date of injury: "First communication of the diagnosis of an occupational disease to the employee . . . shall be treated as the happening of an injury by accident." Id. § 65.2-403(A). This requires a medical diagnosis of a condition caused by the employee's work. In other words, the date is not simply when the employee received a diagnosis of a condition, but the date when the condition was reported to be caused by work. For a repetitive stress injury, this would mean treatment for and diagnosis of a condition coupled with communication that it was believed to be occupational.

Another issue related to reporting is the statute of limitations. If a claimant delays reporting the known injury to his or her employer longer than 30 days after the injury, the claim could be barred. RSI injuries are somewhat longer to emerge and be diagnosed as work injuries than would be typical in traumatic injuries. Thus, there may be some push back from employers caused by late reporting.

Evaluating Coverage

Next, a workers' compensation claim is evaluated by a claims manager (employed either by a third-party administrator, insurance company, or self-insured employer) to assess whether the condition is covered. Many different issues are involved in this evaluation. One that is of importance here whether there was an injury by accident arising out of an in the course of the employment. This determination is much harder than what it might appear to a lay person.

There are a great number of statutory references and case law decisions that define what arising out of employment means in different fact situations. As outlined in this report, in Virginia repetitive stress injuries do not currently meet this definition because they are not the result of a single, identifiable incident. Thus, a claims manager will typically deny coverage for a repetitive stress injury because it is not a single, identifiable incident

Additionally, RSI are a condition the evaluation of which is made difficult, as it is somewhere between a traumatic injury and a disease. Virginia courts have taken a fairly strict approach, requiring an either-or determination; in other words, the injury is legally either a traumatic injury or a disease. Whether the Act is amended to include RSI as a covered traumatic injury, or if the change is to include RSI as a covered occupational disease, the General Assembly should be clear that despite previous court rulings to the contrary, RSI are now covered conditions. This would provide a signal to claims managers to not flatly deny RSI because they "have never been covered." We point out that, under current law, "any condition of the neck, back or spinal column" is not covered as an occupational disease. Most medical definitions of repetitive stress injuries include neck, back, and spine conditions.[15] Thus, depending on how repetitive stress injuries are defined by the Act, claims adjusters may have an unfamiliar, new type of claim to evaluate and manage.

Providing Benefits

The third area to analyze impact is on the provision of benefits. Covering RSI would increase the frequency and cost of claims to Virginia policyholders and self-insurers. But, at the same time, employees injured at work would benefit from compensation for plausible work injuries. In the report we have provided alternative estimates of the cost of broadening coverage taking into consideration uncertainty over the prevalence of RSI in Virginia and how effective the statute might be in limiting the scope of claims. In analyzing potential cost impacts we look at frequency and average cost per claim under alternative scenarios. These scenarios are our attempt to place reasonable upper and lower levels of benefit costs resulting from expanded coverage. In part the range of uncertainty for our cost estimates is a function of how narrowly or broadly the new statutory language defines coverage, e.g., burden of proof for causation, excluding coverage for injury primarily caused by aging, and extending coverage for back and neck injuries. Clearly, there are tradeoffs involved in employer cost versus compensation for injuries not currently covered. It will be up to policymakers to establish an equitable balance.

[15] See generally Kirkhorn, S. and Earle-Richardson, G., *Repetitive Motion Injuries* (2006) (available at http://eknygos.lsmuni.lt/springer/23/324-338.pdf).

Appendix C: Medical Causation

Requiring that an injury or disease be caused by, or primarily caused by, employment is a widely accepted tenet for covering many types of workers' compensation claims. Traumatic injury, such as a car crash, laceration, or broken bone is usually tied to work even without a physician attesting to this. In other circumstances the connection of injury to work may be murky.

Establishing causation as part of broadened coverage for repetitive stress injuries ("RSI")[16] lies at the heart of this study. If an employer could be assured that the injury they are being asked to compensate is primarily due to their workplace, they would presumably be more disposed to support coverage for RSI. Moreover, if the array of contributing factors were identified and their relative contribution assessed, the medical treatment of the diagnosed condition will be improved.

This appendix discusses expert evidence on causation, which must always be supplied by a physician. First, it reviews weakness in current practice for determining causation. It then describes a well-established standard for causation determination. Next, it reviews practical barriers to rigorous causation analysis and how claims administrators deal with reports they find incomplete or inadequate; this includes the treating physician's first reports of injury and opinions on causation. It concludes with some steps that the Commission might follow to improve causation determination and thereby reduce litigation.

States vary on what evidence needs to be shown for work relatedness of RSI. Often, the evidence reduces to checking a box on a form that attests to the statutory standard for an accepted injury. Virginia uses the "Attending Physician's Report" (Form 6) to assist with gathering information that is relevant to a workers' compensation injury; Form 6 is somewhat more demanding than a simple "check the box" type of form. It asks for a description of diagnostic testing and findings. It also asks for the patient's account of how injury or exposure to occupational disease occurred. The form does utilize check boxes (Yes, No, Unknown) for the physician to opine on the work relatedness of the diagnosed condition; this checkbox approach is common among states but leaves a lot to be desired in rigorously assessing work relatedness of injury. The information on Form 6, if **fully** supplied by the physician, would go a long way in assisting claims administrators in determining how they will handle the claim and administration of benefits.

Tennessee is a good case study of what might happen if coverage is expanded for RSI and the determination of causation is left open to the judgment of treating physicians without any criteria to guide their opinions. The Assistant Medical Director for the Tennessee workers' compensation system, Dr. Jim Talmage, asserts that the following single sentence opinion is all too common in the reports of treating physicians: "There is a GREATER than 50% Probability that Mr. X's condition was caused by the work exposure at Company "Z." In Tennessee, the

[16] As in the main body of the report we refer generally to injuries caused by repetitive motion as "repetitive stress injuries" or "RSI."

presumption regarding causation afforded to authorized treating physicians makes such a determination difficult to rebut. Specifically, this statute provides, "[t]he opinion of the treating physician, selected by the employee from the employer's designated panel of physicians pursuant to § 50-6-204(a)(3), shall be presumed correct on the issue of causation but this presumption shall be rebuttable by a preponderance of the evidence."[17]

Fortunately, there is a well-established methodology for making detailed, medically-sound determinations of causation. This methodology was first published by the National Institute for Occupational Health and Safety (NIOSH) in 1979 (citation in the source of the table below). As can be seen by re-publication of the methodology by the American College of Environmental Occupational Medicine (ACOEM) and the American Medical Association (AMA), this standard is well recognized and accepted by occupational medicine specialists. The following table from the ACOEM/AMA lists the recommended six-step methodology for establishing causation in workers' compensation cases. We have included the table focused on disease cases as it is more relevant to RSI causation assessments.

Figure 1: Six-Step Causation Test

National Institute for Occupational Safety and Health/American College of Occupational and Environmental Medicine Steps for the Determination of Work-Relatedness of a Disease
1. Identify evidence of disease
2. Review and assess the available epidemiological evidence for a causal relationship
3. Obtain and assess the evidence of exposure
4. Consider other relevant factors
5. Judge the validity of testimony
6. Form conclusions about the work-relatedness of the disease in the person undergoing evaluation

Source: Excerpted from Melhorn, J.M. et al., *AMA Guides to the Evaluation of Disease and Injury Causation,* (2d ed.) (Table 3-2) (*citing* NIOSH Pub. No. PB298-561 (1979) and ACOEM Guidelines 2004, 2008, & 2011).

The above method is echoed in a "Best Practices" guide for determining causation published by the Texas Department of Insurance, specifically the need to diagnose the condition objectively and thoroughly, use best medical evidence when appropriate, identify the specific connection between the condition and work activities, and the importance of stating the factors that went into the medical judgment regarding causation.[18]

[17] Tenn. Code Ann. § 50-6-102(14(E)).
[18] See: https://www.tdi.texas.gov/wc/hcprovider/documents/bestpractices.pdf

Dr. Talmage, mentioned previously, is a co-author of the ACOEM/AMA definitive guide on causation assessments and advocate of the six-step causation methodology. Dr. Talmage asserts, however, that this rigorous methodology does not appear to be widely adopted by general practitioners. Information from interviews with occupational medicine specialists confirmed that it is not always clear from reviewing sample reports of treating physicians whether their determinations of causation are founded on all, or any, of the steps in this process.

In practice, there are degrees of compliance with the above six step process. For example:

- Step 1: "Identify evidence of disease." This involves gathering all evidence of disease from patient encounter, medical records, and new diagnostic testing. The physician may have identified a diagnosis but did not give evidence for how this was supported or show that other possible diagnoses were considered and ruled out.
- Step 2: "Review and assess the available epidemiological evidence for a causal relationship." This involves consideration of the best available medical evidence showing a connection between work and the diagnosis, including the statistical association of personal risk factors and the diagnosis. The requirement to consider the medical literature is very seldom done by non-occupational medicine specialists. The most extreme departure from the six-step process is probably a complete failure to cite the best epidemiological evidence of a causal relationship between work and the injury in question.
- Step 3: "Obtain and assess the evidence of exposure." This requires investigation into the specific nature of the job of the patient and what exposure it creates for RSI. The glaring defect on many reports is an unrealistic or incomplete assessment of the patient's job risks. Too often the physician accepts a general description of the job from the patient without confirming descriptions of the work from the employer or claims adjuster.
- Step 4: "Consider other relevant factors." Here, the physician assesses other factors that may contribute to the diagnosis, such as preexisting conditions and personal risk factors. This is particularly important if the law requires the doctor to opine on whether the job was the "primary" or "predominant" cause of injury, considering all other contributors.
- Step 5: "Judge the validity of testimony." This step involves the physician considering the history in light of the result of other investigations and judging the validity and relative weight of all the evidence.
- Step 6: "Form conclusions about the work-relatedness of the disease in the person undergoing evaluation." This final step is the critical report on findings and considered judgements. The treating physician's thoughts on how the evidence was considered is often not spelled out in a generic report. Just rendering a yes or no on occupational causation without a full statement of the basis for this is akin to a judge issuing a decision with no justification.

The information gleaned from these steps would greatly assist claim adjusters in evaluating coverage in a workers' compensation case involving RSI. An item of particular interest is whether the physician truly understood the work performed by the claimant and how their representations matched the formal job description (AMA step 3). This is not only important for a causation determination but also needed for duty restrictions for return to work.

Once the job of the claimant is accurately understood by the treating doctor, there remains the question of how that job could have caused the diagnosed injury. In Saskatchewan, Canada, claim adjusters utilize an established policy in evaluating the relationship between required job activities and RSI causation, focusing on the force and repetition required by the job. The following matrix is established by policy to provide guidance on these factors.

Figure 2: Evaluating Force and Repetition Involved in Job Activities

HIGH FORCE/LOW REPETITION
• Medium to high probability of employment relationship.
• Probability increased with poor ergonomics.
• Job examples:
  ○ Grinder operator.
  ○ Electricians.
	HIGH FORCE/HIGH REPETITION
	• High probability of employment relationship.
	• Probability increased with poor ergonomics.
	• Job examples:
	  ○ Meat cutters.
	  ○ Carpenters.
	  ○ Jack hammer operator.

LOW FORCE/LOW REPETITION
• Low probability of employment relationship.
	LOW FORCE/HIGH REPETITION
	• Medium to high probability of employment relationship.
	• Probability increased with poor ergonomics.
	• Job examples:
	  ○ Typists.
	  ○ Cashiers.
	  ○ Painters.

Source: Excerpted from Saskatchewan Workers' Compensation Board, *Policy and Procedure Manual, Appendix G: Repetitive Strain Injuries* (May 1, 2020) at 145 (available at http://www.wcbsask.com/wp-content/uploads/2016/02/SK-WCB-Policy-Procedure-Manual-May-1-2020.pdf).

Claim adjusters also would be very interested in evidence of other health issues in evaluating RSI. They need to know if the physician had inquired into non-work activities and health issues that might also have caused the symptoms of injury (AMA step 4). Concerns about other health or personal risk factors is frequently brought up by stakeholders as a drawback to expanding coverage for RSI, as the symptoms can mirror symptoms of common ailments. Given that in workers' compensation, the employer "takes the employee as they find them," there is concern that common, everyday health issues will become the employer's responsibility. A frequently noted concern involves injury to older workers, particularly with economic shifts where the

average age of the workforce is increasing. Age is medically established to predispose a person to many types of injury, e.g., shoulder injuries increase with age regardless of the inherent hazards of the job. States have handled these issues in various ways, for example by requiring a certain length of employment before providing coverage for such conditions; by increasing the burden of proof, similar to how Virginia currently handles "ordinary diseases of life"; and by enhancing the causation standard, for example requiring work to be a "major contributing cause" or the "primary cause." Kentucky excludes injuries caused by the "effects of the natural aging process."[19] Such issues are involved in *any* case, however, and not just one involving repetitive stress injuries. Thus, the more thorough a causation opinion from a treating physician, the less concern there is that non-occupational conditions will insinuate themselves into the workers' compensation system.

According to the AMA, the information needed by the doctor to make a sound analysis of causation may be available at the time of the first visit. However, obtaining additional information (previous medical records, additional diagnostic testing, and detailed job description) is almost always necessary. The minimum initial assessment of causality may be based on a thorough initial assessment. But, the degree of uncertainty should be clearly communicated to the patient and employer. The adjuster can then follow up and ask for additional information or call for an IME examination.

In the interest of speed and efficiency an adjuster might be satisfied with a report that shows a reasonable understanding of the job in question and the mechanism of injury. Willingness to accept flawed reports where the doctor did not completely understand the nature of the work and its level of risk can become a source of friction between employers and claims adjusters. Employers expect the adjuster to "cover all the bases." Note that the workers' compensation system in Virginia utilizes "employer panels" meaning that, prior to injury, employers, working with their insurer or third-party administrator, establish physician panels from which injured employee make a selection of treating physician. This provides an opportunity for assembling a cadre of providers who have familiarity with relevant job tasks and activities and thereby make the causation process more efficient.

The AMA guidelines (following in the heritage of NIOSH and ACOEM) attempt to elevate causation decisions from being based solely on generalities such as: 'in my many years of experience I find. . . .' Rather, they seek to add medical evidence on "the statistical connection between certain symptoms and types of work." With respect to causation, "scientifically referenced reports are preferred. . . . [T]he evidence-based report will discuss the available medical literature on causation, the presence or absence of other risk factors or injuries, and the mathematical likelihood that the exposure is related to the illness or injury in question."[20] What the guidelines seek is to identify injury hazards strongly associated to the occupation in which the employee was known to have engaged. It may be difficult for a non-occupational specialist to have a working knowledge of the massive literature on occupational injuries.

[19] Ky. Rev. Stat. 342.0011(1). Other states, e.g., Kansas and Missouri, have similar exclusions.
[20] Melhorn, J.M. et al., *AMA Guides to the Evaluation of Disease and Injury Causation,* (2d ed.).

However, it is common practice for a claims adjuster to call to the attention of the treating physician specific medial evidence that statistically relates the injury in question with job duties. For example, there is strong evidence that occasional key entry does not cause carpal tunnel syndrome, whereas meat cutting is strongly associated with CTS. Familiarity with such evidence equips the physician in making insightful investigation and drawing conclusions therefrom.[21]

The validity and credibility of the treating physician's reports would be enhanced if the six-step causation process was established as the normative process for credibly determining causation. In an ideal world, the physician's initial report and follow up investigation would document the above process. But a more practical option is for the claims adjuster to follow up with the physician to ask for evidence on issues of concern. For example, the adjuster might send the employee's job description or a video of the required work process. Giving the adjuster such medical evidence that work was indeed the primary cause of injury should help prevent litigation.

It may be an uphill struggle, however, to persuade general practitioners to spend the time learning and following the ACOEM/AMA six-step process. In particular, the medical literature quantifying risk factors is daunting for an untrained doctor. The following table from the ACOEM/AMA guide presents a methodology for evaluating epidemiological studies in assessing factors relevant to causation.

[21] The use of evidence to prove causation and determine the course of treatment is widely accepted within the medical community. A report by the US DOL reinforces the need for medical evidence, recommending that: "Identification of evidence-based approaches to improve the effectiveness of workers' compensation systems." ACOEM consistently promotes evidence based medical practice.

Figure 3: Evaluating Causal Relationship

Steps for Concluding a Causal Association Exists
1. Collect all epidemiological literature on the disorder
2. Identify the design of each study, giving stronger consideration to superior study designs, provided each study has sound methodology
3. Assess the methods of each study, including the existence and degree of:
a. Exposure assessment methods and potential biases b. Disease ascertainment methods and potential biases c. Absence of significant uncontrolled confounders; consideration of residual confounding d. Addressing of other potential biases or fatal flaws e. Adequacy of biostatistical methods and analytical techniques
4. Ascertain statistical significance and the degree to which chance may have produced the results
5. Assess the studies using the Updated Hill Criteria; apply the criteria to individual studies (especially 5a-5c) and to the studies as a whole (5a-5l):
a. Temporality b. Strength of association c. Dose-response relationship d. Consistency e. Coherence f. Specificity g. Plausibility h. Reversibility i. Prevention/elimination j. Experiment k. Analogy l. Predictive performance
6. Conclusion about the degree to which a causal association is or is not present

Source: Excerpted from Melhorn, J.M. et al., *AMA Guides to the Evaluation of Disease and Injury Causation,* (2d ed.) (Table 3-1).

Only a small number of providers are likely to have working familiarity with these guides. According to ACOEM, 10-20 thousand physicians identify as practicing occupational medicine, but only about 4500 are ACOEM members.[22] This is a tiny fraction of the roughly 113,000 family medicine and 115,000 internal medicine doctors in active practice nationally. Focusing on Virginia, one statewide physician directory showed only, 87 medical doctors that listed their

[22] Presentation of Lesoski, D., M.D., Michigan Occupational Health Conference (Oct. 2017) (available at http://www.moema.org/files/ACOEM_Update.pdf).

specialty as "occupational medicine."[23] This presents a challenge to employers in the selection of designated panel physicians as primary providers to treat their injured workers.

Interviews with Virginia adjusters (and other states WCS has worked in) confirmed that placing qualified physicians on panels, with experience with occupational medicine, is critical in successful worker recovery and safe return to work. The six-step process outlined above could be part of the panel "management" process to ensure that causation questions are fully and predictably addressed. Persistent failure to offer rigorous injury and causation reports could be a reason for changing the panel.

Workplace safety is another area where standard loss-prevention practices can help prevent RSI. Employers that implement such practices will be better equipped to defend themselves against the alleged connection between work and RSI (step 3 in the six-step process). More importantly, such injuries can be avoided in the first place. In summary, developing a mechanism for employees, employers, physicians, and adjusters to assess causation and prevent injury in the first place fosters predictability in the system.

We now turn to explaining why incomplete or cursory medical reports on causation might overly favor work relatedness, followed by a discussion of possible remedies. Doctors are most certainly intelligent and well trained in some aspect of medicine. They routinely deal with recording their decision process on medical records and writing reports to payers to justify treatment. This begs the question, then, as to why causation options of treating physicians can be lacking in needed specificity, completeness, and rigor? We offer these possible explanations for why causation reports are vague or incomplete.

- Unless they are trained in occupational medicine, treating physicians may not be aware of the reasoning behind the best practices among occupational medicine specialists for diagnosing and treating the condition of the injured worker.
- Applying more thorough clinical procedures in recording personal activities and doing diagnostic testing add to the time of a visit. After the initial visit, extra-clinical data gathering about job exposures is time consuming. Referencing epidemiological studies requires time. For these reasons, it may be more efficient for a doctor's practice and more acceptable to busy adjusters to make a quick "best judgment" determination on causation from the initial encounter.
- There may be financial considerations involved in simply giving the situation the benefit of the doubt and declaring a patient's condition to be caused by work rather than by non-work cause(s). If they determine it is non-work related, they may not get paid at all if the patient has no health insurance.

[23] This count only includes MDs that labelled their practice "occupational medicine." Doubtlessly, other doctors have a great deal of experience treating work injuries, without singling out their practice as occupational medicine. See directory at:
https://www.healthgrades.com/usearch?what=Occupational%20Medicine&entityCode=PS581&where=VA&pageNum=1&sort.provider=bestmatch&state=VA

- Telling a patient that their claim of work injury is medically unjustified will often create a poor reaction from the patient, especially if they do not have health insurance to cover non-occupational injuries, or if they wanted time off from work.

There are ways to overcome or mitigate poor medical reports on causation. For example, as discussed above, employers can be more selective in choosing doctors that have a good record of outcomes in treating work injuries for employers in the area. In Virginia, adjusters can work with employers to establish physician "panels" to provided treatment in workers' compensation cases. The chief difficulty with this is the paucity of occupational specialists, but a second-best solution would be to select doctors with frequent experience treating work injuries and who have a track record of giving detailed medical reports.

Another possible mitigation is to have the treating physician's opinion on causation presumed correct, provided they performed a rigorous causation analysis such as the one described above. Tennessee utilizes this approach of a statutory presumption, and in most states, including Virginia, there is a strong evidentiary preference for an opinion from a treating physician. Importantly, guaranteeing payment to the physician for providing the opinion, regardless of whether the doctor cites work or non-work as the cause, is also an important aspect to compliance. Occupational medicine specialists have said that this would go a long way to overcoming resistance to rigorous medical reports on causation.

Employers are also a key player in improving causation determinations. Adjusters could work with employers and providers to quickly supply key information, e.g., job description with videos or careful descriptions of the types of tasks actually done, witness reports, and medical evidence pertinent to the condition at hand. We have seen evidence in other states that establishing a respectful professional relationship between employers, doctors, and claims adjusters set the tone for good medical reports.

The ACOEM/AMA six-step process could be adopted by rule as the best practice in making causation determinations. Input from medical providers and claims specialists in structuring the format of such reports to ensure broad acceptance. Different requirements could be placed on using the standard. For example, failing to adhere to these standards could be weighed as failure to meet the burden of proof on a claim. Allowing for an addition to the fee schedule for medical providers who provide this documentation would also support compliance. Such a process resulting in a rule would support consistent and thorough causation opinions and go a long way in preventing unnecessary doctors' depositions and use of ad-hoc questionnaires to arrive at the same result.

In conclusion, how medical providers respond to broadened coverage in determining causation will have a major effect on the frequency of claims, claim cost, and other outcomes of the system. This risk factor interacts with the other factors that impact overall cost of this change: litigation, coverage of non-occupational conditions, and exclusion of legitimate occupational conditions. In an ideal world, doctors will apply the best techniques and use the best medical evidence available. This applies not only to the initial causation determination, but to additional

causation decisions in the case once compensability is established, such as justifying a treatment due to the injury or the connection between the initial injury and any sequalae conditions. An essential component of broadening coverage for RSI should be establishing a clear, accepted causal connection between the condition diagnosed by the doctor and that patient's job duties.

Appendix D: Repetitive Stress Injuries as a Cost Driver

All things being equal, one should be able to simply look at the RSI costs in a sample of other states to determine how much RSI coverage costs the system. All things are not equal, however, and some states, although allowing RSI, have other aspects impacting their respective systems that make controlling for such variables difficult if not impossible. For example, a state may have a high maximum compensation rate, a short waiting period, and high average medical costs. This state should have higher overall costs compared to a state with a lower maximum compensation rate, a longer waiting period, and lower average medical costs. Additionally, "allowing" RSI does not place a state on a level playing field with other states that allow RSI. As discussed in the Appendix comparing state laws, states vary in the standards used to evaluate causation; what this means is that a state may allow RSI but have a relatively strict causation standard. This might mean that while RSI claims are covered, claims in general are likely reduced. For example, the rate of claims for carpal tunnel syndrome in Virginia, which is currently a covered condition, is significantly lower than regional and national rates.[24]

This type of variation suggests that one should drill down into the laws of a particular state to see how they drive RSI claims. North Carolina shares many common with demographics, economy, and industry with Virginia. The maximum compensation rate and waiting period are similar to Virginia's. Also similar to Virginia, North Carolina pays temporary total disability benefits up to 500 weeks. This can be terminated by a permanency award, but in North Carolina the employee can choose whether to accept the award or continue on temporary disability. In this way North Carolina and Virginia have similar "award state" features. Unlike Virginia, North Carolina does provide for permanency ratings of the back. As for RSI, North Carolina provides for these in the occupational disease section, but has a schedule that includes bursitis, synovitis, and tenosynovitis. There is also a catch-all for other conditions, but these exclude any condition "to which the general public is equally exposed outside of the employment."

Another feature of the North Carolina system relevant to this analysis is the prohibition against coverage of injuries suffered by employees performing their "normal job." In other words, there must be an unexpected accident, such as a slip, trip, or fall. An arm injury incurred while performing a motion expected in the employment would not be unexpected. This does not apply to certain back injuries. Thus, North Carolina and Virginia appear to both have relatively strict treatment of RSI in statute and court interpretations. Another point in favor of using North Carolina as a model for how many RSI claims might emerge in Virginia is the fact that the mix of employment in the two states is relatively similar. Specifically, both states have lower levels of employment than the nation as a whole in high risk jobs, e.g., assembly line manufacturing and food processing.

Tennessee provides another model of what could happen in Virginia under broadened coverage. Tennessee covers RSI by statute and has a seemingly strict statutory standard for the

[24] Virginia's rate of 0.09% is over 4 times lower than the national rate (0.4%) and three times lower than the regional rate (0.3%). *See infra*, Figure 6.

nature of compensable injuries generally, including RSI. Tennessee also has strong preference for reports by treating physicians, providing that the opinion regarding causation is presumptively correct, though subject to rebuttal by the employer. Given the fact that employers select the panel of treating physicians, one would think that the physicians would be rigorous about causation. These two factors would lead one to think that Tennessee would have a low rate of compensable RSI claims. However, in practice treating physician opinions often lack sufficient depth on the topic of causation. Since most states (like Virginia) tend to offer general deference to treating physician reports, the incidence of RSI in a state may be heavily influenced by how carefully employers select doctors with occupational injury experience to include on a physician panel.

Other features to note about the Tennessee system: Similar to North Carolina and unlike Virginia, permanent impairment can be paid for back and neck conditions in Tennessee. Tennessee is not an "award state" for permanency, meaning that once an employee reaches maximum medical improvement, their impairment is rated, the permanency benefit is paid, and the claim is closed. The Tennessee statute does utilize other factors in determining permanency, however, such as education and unemployment rates, which in effect adjusts a permanency award (higher) if circumstances warrant such adjustment. The Tennessee statutory maximum for weekly benefits ($1,093) is similar to Virginia's ($1,137).

In effect, the rate of RSI in North Carolina is very limited, while the frequency in Tennessee is more in line with national results. This is confirmed by BLS data, which show the following incidence rates: 1.2% (NC) and 2.0% (TN) of all reported lost time claims in 2018, compared with 3.4% nationwide (1.0% in Virginia). Note that BLS data is reported injuries, not paid claims. Data from paid claims show frequency nationwide at 2.1% (NCCI 2014-18) and 2.2% in Tennessee (EDI data 2017; NC paid claim data not available). The somewhat higher relative rates of RSI in Tennessee may be due to Tennessee's higher share of employment in industries prone to RSI injuries, e.g., manufacturing (8.9% TN versus 4.7% VA) and Transport and Material Moving (11.3% TN versus 7.7% VA).

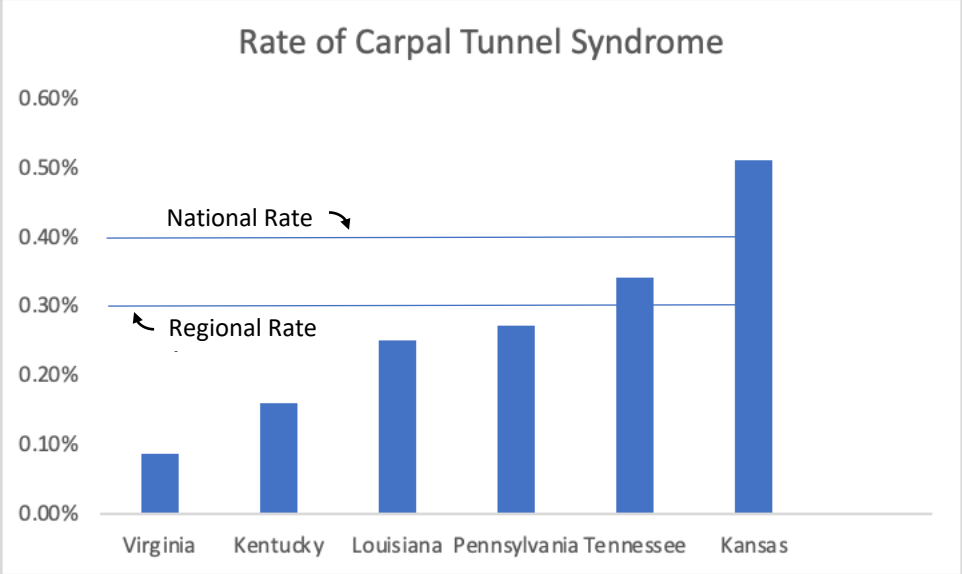
In summary, North Carolina and Tennessee might serve as templates for how RSI coverage might expand in Virginia. The North Carolina system appears to mirror Virginia's current approach of a strict causation standard, and incidence rates are similarly very low. In Tennessee RSI are more generally accepted, although the causation standard is crafted specifically to minimize allowance for non-occupational causes of injuries. The results in Tennessee are in line with national results. In conclusion, these two state comparisons demonstrate the range of results that Virginia might experience in expanding coverage for RSI, and in particular demonstrate the potential impact from statutory approaches to limiting coverage in particular cases.

Appendix E. Comparison of Other State Laws

Introduction

Workers' compensation is a state-based system, and thus each state develops its own respective programs. Certain program elements, however, tend to converge across states. Of particular interest in this comparison are the following: 1) identifiable similarities or dissimilarities in current Virginia law, including contrasting the accident approach with the disease approach; 2) causation and burden of proof standards; and 3) particular language in limiting or defining the scope of coverage. Some of the states provided data concerning coverage of repetitive motion injuries. The following figure shows reported claims (EDI data; 2017 AY) using the nature of injury code for carpal tunnel syndrome. The horizontal lines showing regional and national percentages are from NCCI reported data on paid claims cumulated over AY 2014-18; the regional data included Maryland, D.C., and Kentucky; the national data includes NCCI states (36 out of 51 states plus D.C.)

Figure 4: Comparison of Carpal Tunnel Syndrome Rates



This indicates that Virginia's rate of carpal tunnel syndrome, a covered repetitive stress injury, is well below that in other selected states providing EDI data and regional and national rates. This is an excellent illustration of how the outcome of a law can be influenced strongly by a host of factors, such as how the law is administered, case law on interpreting statutes, the claims environment in a state and the quality of medical care. The sharply lower rates of CTS in Virginia might be explained by the rigorous burden of proof in Virginia and to an industry mix in Virginia that has relatively few high-risk jobs for CTS.

The following states (presented alphabetically) were selected for comparison because they were identified as providing examples of how injuries by repetitive motion are covered elsewhere; the list is not exhaustive.

State Comparisons

Florida

Florida treats causation of occupational disease similarly to accidental injuries, requiring proof that "the nature of the employment was the major contributing cause of the disease." Fla. Stat. 440.151. The statute further defines "nature of the employment" to mean that in the occupation engaged in, "there is attached a particular hazard of such disease that distinguishes it from the usual run of occupation, or the incidence of such disease is substantially higher in the occupation in which the employee was so engaged than in the usual run of occupations." The statute also requires proof by "clear and convincing evidence," which is a heavier burden of proof than for other injuries.

Illinois

Illinois uses a "six-part test" in covering occupational diseases, which is similar to Virginia's test for occupational diseases. One major distinction is that the statute specifically allows "aggravations." In other words, an occupational disease is one arising out of an in the course of the employment, or a disease that has "become aggravated and rendered disabling as a result of the exposure of the employment. Such aggravation shall arise out of a risk peculiar to or increased by the employment and not common to the general public." 820 ILCS 310/1. The disease must either have its "origin" in the employment or it must have been aggravated by the employment. 820 ILCS 310/1. The Illinois statute also makes clear what "common to the general public" means in describing that exposure means that "for any length of time however short, he or she is employed in an occupation or process in which the hazard of the disease exists."

Indiana

The standard for an "injury" is "injury by accident arising out of and in the course of the employment." Ind. Code 22-3-2-2(a). Historically, Indiana used an "accident" focus with respect to cumulative trauma injuries, meaning that the courts looked for a sudden and unexpected event. Indiana then shifted to examining whether the injury itself was unexpected. In other words, the inquiry changed from "was the untoward event unexpected" to "was the untoward result of the event unexpected." This shift occurred by case law in 1986. *Evans v. Yankeetown Dock. Corp.*, 491 N.E.2d 969 (Ind. 1986). In 1991, this shifted further to making compensable the aggregation of smaller traumatic events. *Union City Body Co. v. Lambdin,* 569 N.E.2d 373 (Ind. Ct. App. 1991). The movement to a liberal interpretation of accident is shown in a 1994 case, in which an employee developed a degenerative condition as a result of work, but the condition only manifested itself through a lifting event outside of work, yet this condition was held compensable. *Four Star Fabricators, Inc. v. Barrett*, 638 N.E.2d 792 (Ind. Ct. App. 1994).

Kansas

In Kansas an injury by accident is considered to arise out of the employment only if "the accident is the prevailing factor causing the injury." Kan. Stat. 44-508. Specifically excluded are injuries from "the natural aging process or by the normal activities of day-to-day living." A "prevailing" factor is defined as the "primary factor, in relation to any other factor." Injuries from repetitive motion are covered, not as an accident or disease, but by special definition:

> 'Repetitive trauma' refers to cases where an injury occurs as a result of repetitive use, cumulative traumas or microtraumas. The repetitive nature of the injury must be

> demonstrated by diagnostic or clinical tests. The repetitive trauma must be the prevailing factor in causing the injury.

Kan. Stat. 44-508. The statute further requires that the employment must have exposed the employee to "an increased risk or hazard which the worker would not have been exposed in normal non-employment life."

Kentucky

Kentucky defines an injury as a "traumatic event or series of traumatic events, including cumulative trauma." Specifically excluded, however, are the "effects of the natural aging process." Ky. Rev. Stat. 342.0011(1). Occupational diseases are defined in a similar manner to Virginia, but, unlike Virginia, Kentucky does not generally prohibit coverage for ordinary diseases of life. For occupational diseases Kentucky uses the conventional causation standard "arising out of and in the course of the employment." Ky. Rev. Stat. 342.0011(2).

Louisiana

The Louisiana statute excludes as an injury any "gradual deterioration or progressive degeneration." LA Rev. Stat. 23:1021(1). The statute covers repetitive stress injuries as a disease, however, and specifically includes "work-related carpal tunnel syndrome." An occupational disease is a "disease of illness which is due to causes and conditions characteristic of and peculiar to the particular trade, occupation, process, or employment in which the employee is exposed to such disease." LA Rev. Stat. 23:1031.1. The statute specifically includes carpal tunnel syndrome and specifically excludes "degenerative disc disease, spinal stenosis, [and] arthritis of any type." The statute also establishes a presumption that a disease was not contracted in employment that has a duration shorter than 12 months, but this can eventually be established by evidence that the disease was contracted "during the course of the prior twelve months' employment."

Missouri

Missouri uses the "prevailing factor" standard for all injuries. The employee must show that the work injury is the "prevailing factor in causing both the resulting medical condition and disability." "Prevailing factor" is defined as "the primary factor, in relation to any other factor, causing both the resulting medical condition and disability." Mo. Rev. Stat. 287.020(3). Repetitive motion injuries are covered as an occupational disease, but only if the "occupational exposure was the prevailing factor in causing both the resulting medical condition and disability." Mo. Rev. Stat. 287.067(3). The condition "must appear to have had its origin in a risk connected with the employment and to have flowed from that source as a rational consequence." Missouri excludes conditions that are caused by "ordinary, gradual deterioration, or progressive degeneration of the body caused by aging or by the normal activities of day-to-day living."

Nevada

Nevada uses a list of scheduled conditions as covered occupational diseases. Included on the list are the conditions of "tenosynovitis and prepatellar bursitis." Nevada has a 90-day Nevada residency or continuous employment requirement for compensability of these conditions, however. Nev. Rev. Stat. 617.430(2). Other, non-listed conditions may be covered as occupational diseases if they do not arise from "a hazard to which workers would have been equally exposed outside of the employment." An "aggravation" of a pre-existing condition that

does not have its origin in the employment is compensable, unless the employer proves that employment was not "a substantial contributing cause" of the aggravated condition. Nev. Rev. Stat. 617.366.

North Carolina

In North Carolina an "accident" is defined as excluding a "series of events in employment, of a similar or like nature, occurring regularly, continuously or at frequent intervals in the course of such employment, over extended periods of time." N.C. Stat. 97-52. However, diseases attributable to such causes are compensable, if they are on a scheduled list of diseases; included on the list are "bursitis, due to intermittent pressure in the employment," "Synovitis, caused by trauma in employment," and "tenosynovitis, caused by trauma in employment." N.C. Stat. 97-53. There is a "catch all" condition covering diseases "due to causes and conditions which are characteristic of and peculiar to a particular trade, occupation or employment" but any condition "to which the general public is equally exposed out of the employment" is excluded.

Oregon

In Oregon, an occupational disease is compensable if caused by "substances or activities to which an employee is not ordinarily subjected or exposed other than during a period of regular actual employment." OR Rev Stat 656.802. Specifically included are injuries caused by "any series of traumatic events or occurrences which requires medical services or results in physical disability or death." Proof that employment activities were the "major contributing cause" is required. Oregon uses the "major contributing cause" standard for both traumatic injuries and occupational diseases. Oregon specifically allows aggravations of pre-existing conditions, but again requires proof that the injury was the "major contributing cause" of the condition. The statute further requires that a compensable injury must be established by "medical evidence supported by objective findings" Or. Rev. Stat. 656.005(7)(A). More stringent requirements apply to "mental disorders." This "major contributing cause" standard was enacted in 1990, and further refined in 1995, by the Oregon Legislature to constrain coverage of certain injuries and better control system costs. A good summary of the impact from these changes on costs can be found in: Welch, Edward M., *Oregon Major Contributing Cause Study* (Oct. 5, 2000) (available at https://www.oregon.gov/dcbs/reports/Documents/archive/arc-general/finalmcc.pdf).

Pennsylvania

In Pennsylvania, an occupational disease is defined as "diseases (1) to which the claimant is exposed by reason of his employment, (2) which are causally related the industry or occupation, and (3) the incidence of which is substantially greater in that industry or occupation than the general population." 77 Penn. Stat. § 27.1. Injuries from repetitive motion are not specified in the statute but are considered compensable. Aggravations of pre-existing diseases or conditions are covered. See https://www.dli.pa.gov/Businesses/swif/claims/Pages/What-is-Work-Related-Inury-and-Occupational-Disease.aspx

South Carolina

South Carolina excludes injuries from repetitive motion as an accidental injury but covers them either as a defined "repetitive trauma injury" or an occupational disease. SC Code § 42-1-160(F). The statute defines a "repetitive trauma injury" as "an injury which is gradual in onset and caused by the cumulative effects of repetitive traumatic events." SC Code § 42-1-172. The

section goes on to require medical evidence establishing a causal connection between the "repetitive activities that occurred while the employee was engaged in the regular duties of his employment and the injury." The evidentiary standard is "preponderance of the evidence." An occupational disease is covered if it is "due to hazards in excess of those ordinarily incident to employment and is peculiar to the occupation in which the employee is engaged." S.C. Code 42-11-10. The evidentiary standard is "preponderance of the evidence." The disease must be "recognized as peculiar to a particular trade, process, occupation, or employment." The statute also requires proof of cause "from a hazard to which the workman would have been equally exposed outside of his employment." It allows for "ordinary" diseases "to which the general public is equally exposed" if there is proof of "continuous exposure peculiar to the occupation itself which makes such disease a hazard inherent in such occupation." South Carolina does exclude "any chronic disease of the skeletal joints."

Tennessee

Tennessee covers "cumulative trauma conditions" including "hearing loss, carpal tunnel syndrome or any other repetitive motion conditions" so long as the condition arose "primarily out of and in the course and scope of employment." Tenn. Code Ann. 50-6-102(14). This standard similarly applies to "the aggravation of a preexisting disease, condition or ailment." The "primarily" standard is defined as requiring that the "employment contributed more than 50 percent (50%) in causing the injury, considering all causes." The effect of this definition is that it is mathematically impossible to have more than one "primary cause" in that by definition, a primary cause is more than 50% of all causes. The employee's treating physician's opinion is presumed correct on the issue of causation, but this presumption is rebuttable by a preponderance of the evidence.[25] Prior to 2015, Tennessee used a six-part test similar to Virginia's. The statute was amended effective 2015 to treat occupational diseases like any other injury. The six-part test used prior to 2015 did not have a higher burden of proof and did not exclude neck and back injuries, but excluded conditions from a "hazard to which workers would have been equally exposed outside of the employment."

Summary and Conclusions

This selection of states is not comprehensive but provides a fair representation of various approaches to covering RSI. More of the states above define coverage of RSI as an occupational disease, with a fair number providing a special definition. Some include them as a traumatic injury, and others simply include them through case law. Each state covers occupational diseases generally, and some utilize a list of qualifying diseases but allow for other non-listed diseases. Several of the states include aggravations of diseases as covered conditions, with some requiring increased evidence of a causal connection, e.g., Nevada requires that the employment be a "substantial contributing cause" to an aggravation.

[25] Note that WorkComp Strategies participated in an analysis of the Tennessee workers' compensation system in 2012 and made recommendations to clarify the causation standard due to inconsistent interpretations of the standard and concerns over courts covering conditions based on a "could have been caused" standard. In 2013, Tennessee enacted reforms that, among other things, tightened the causation standard; the "arising primarily" standard for repetitive motion conditions, however, was in place *prior* to the analysis or reforms.

A few of the states surveyed utilize a causation standard for workers' compensation injuries generally, which would appear to be more strict than a simple "more likely than not" standard. The standards range from "primary cause" to "major contributing cause" to "prevailing" cause. Most of the states call for specific proof of a causal connection with work when it comes to an occupational disease. Most states share the following elements in defining what qualifies as an occupational disease:

- A work exposure to a risk of the disease
- A risk that is peculiar to a specific employment
- Employment activities that involve an elevated risk of the disease in question

A few of the states deal with "complex" cases where causation is particularly difficult by excluding certain conditions (degenerative disc disease; spinal stenosis; arthritis; chronic disease of the skeletal joints) or by excluding certain causes (natural aging process; normal activities of day-to-day living). Nevada and Louisiana provide for "waiting periods" before holding employers responsible for covering these complex cases.

As noted in the main body of the report, Virginia uses a general "preponderance of the evidence" standard for traumatic injuries but excludes RSI as a covered traumatic injury. This is not uncommon among states, to exclude RSI as a covered traumatic injury. What is unusual is that Virginia also excludes RSI as a covered occupational disease (other than carpal tunnel syndrome and hearing loss). Where other states exclude RSI as a covered traumatic injury, they specifically allow them either by special definition or as an occupational disease. Even if RSI is allowed as an occupational disease Virginia's approach to disease coverage is fairly strict compared to other states, although as noted above it is not uncommon for states to impose unique or heightened coverage standards.

Appendix F: Methodology

Introduction

The central question raised from this analysis is: how many new compensable claims are likely for Virginia and what will those claims cost if typical coverage for RSI is enacted? In this appendix we provide additional detail concerning the methodology used to analyze the frequency and cost of repetitive stress injuries and estimate Virginia's experience in broadening coverage for such claims. Cost is broken into two components: indemnity cost (due to time away from work) and medical cost. Virginia indemnity costs are fairly stable and track well with typical indicators. Medical costs, however, historically quite high in Virginia, have experienced some recent downward effect as brought about by adoption in 2018 of a medical fee schedule. To briefly illustrate the methodology concerning medical cost, we have computed total medical cost from the incidence of claims by multiplying the projected number of claims by the average medical cost estimate for treatment of RSI across the country, after making certain adjustments. Our medical cost estimate is our reasoned analysis and not an actuarial projection. The estimate reflects historically higher medical costs but makes allowance for future cost reduction from the fee schedule, such that Virginia's experience will over time more reflect nationwide medical costs.

A related question is will claims for RSI as a percentage of overall claims increase or decrease in the coming years? We have no means of statistically determining if there is a trend in yearly claims that should apply to our extrapolation from 2014 to 2020 and beyond. Given the long trend in reduction of compensable injuries overall in both Virginia and nationally, however, it seems reasonably safe to conclude that the incidence level in recent years produces a higher estimate of claims cost than might develop in 2020 and beyond.

Data Sources

In addition to stakeholder interviews, analysis of other relevant research and studies, and statutory and case-law research, we built a database of information about RSI from three sources: U.S. Bureau of Labor Statistics (BLS); insurer claim payment data; and electronic data interchange (EDI) reports to various state workers' compensation agencies. For BLS data we used the "Nonfatal cases involving days away from work: selected characteristics," which is part of the Survey of Occupational Injuries and Illnesses. This annual survey of approximately 200,000 employers across the U.S. captures information from both private industry and state and local government employment. Characteristics relevant to this analysis are captured, including details about the event leading to the injury and the nature of the condition. For example, one of the categories of "events" includes "overexertion and bodily reaction" and within that is the event "overexertion in lifting – multiple episodes." Similar taxonomy regarding lowering, pushing, pulling, turning, holding, carrying, wielding, throwing, and catching are included. Other relevant categories include repetitive motions involving microtasks, as well as "repetitive or prolonged" exertions including bending, crawling, reaching, twisting, climbing, stepping up or down, kneeling, sitting, standing, walking, running, boarding, and alighting. These categories do not overlap. As for the nature of condition category, carpal tunnel syndrome and the conditions of bursitis, tenosynovitis, epicondylitis are included. When

reviewing results regarding the nature of condition, we understand that these conditions may be caused by a single traumatic event as opposed to repetitive motion, but we are able to control for this by also selecting an appropriate repetitive event. It is important to emphasize that the BLS data is based on employer responses to the survey, which means that the injuries may or may not be completely reported and may not be compensable for workers' compensation. BLS also uses its own methodology for classifying injuries. Thus, these data were used in conjunction with other sources for confirmatory purposes.

Insurer claim payment data was sourced primarily from the National Council on Compensation Insurance (NCCI) as well as the Minnesota Workers' Compensation Insurers Association (MWCIA). NCCI collects data from insurers in the capacity of their licensed statistical agent for workers' compensation data in 36 states, including Virginia. NCCI also has access to other states' data in certain circumstances. MWCIA is an independent rating bureau, and provides services similar to NCCI, but solely for the state of Minnesota.

Insurers report to NCCI "unit data" concerning claims, based on the policy year. These units are updated each year, and thus an injury can be "developed" over several years to provide a fuller picture of the cost of a claim when all losses are finally paid and claims closed. NCCI also collects detailed medical data from insurers. Unit data reports use coding standards from the Workers' Compensation Insurance Organizations (WCIO). WCIO code sets include the "Nature of Injury," the "Cause of Injury," and the "Body Part." For Nature of Injury, we used the general "sprain" and "strain" codes, limited by the cause of injury codes relevant to repetitive motion: strain or injury by repetitive motion, rubbed or abraded by repetitive motion, and cumulative/not otherwise classified. We also looked at the nature of injury codes for carpal tunnel syndrome and hearing loss as well as the miscellaneous catch-all "All other cumulative/not otherwise classified."

Some caveats on this data include: 1) the codes are reported with the initial unit report, and whether they are updated as the claim develops is not certain; this could be important with RSI, because at the initial report there may be insufficient information about the claim to code it with complete accuracy; and 2) classifying injuries with these codes is subject to some misclassification error by insurers when the code assigned by insurer is inappropriate to describe the actual injury. Despite these caveats, it is our belief that NCCI has established rigorous reporting standards and has programs in place to enforce compliance. An additional caveat on NCCI data is that it involves insured claims only. In other words, creating estimates based on insured data may not be reflective of Virginia self-insured employers. Importantly, however, we have used national results from NCCI, which would include a broad range of industries found among Virginia self-insured employers. We have also reviewed reported job classifications of Virginia self-insured employers, to ensure that in the aggregate there are not factors that would skew estimates, either to result in more RSI claims than expected among Virginia self-insured employers, or fewer.

Based on reported payroll groupings from 2019, slightly over two-thirds of Virginia self-insured employment (68%) was in the government sector (state and local government). There is wide

variety of employment among the government sector, although it is heavily weighted in office and administrative support and education occupations. National BLS data from 2019 show that the incidence of injuries from repetitive motion resulting in lost time was lower among state and local government employers than private employers, at 1.54% versus 2.87%. Another major segment of employment among Virginia self-insured employers involves healthcare related occupations, which also have a lower RSI incidence rate than all private industry. Other industries among Virginia self-insured employers, for example transportation, construction, and manufacturing, as well as other occupation types, for example office and administrative support, are at relatively higher risk of RSI. Incidence rates of RSI among office and administrative support occupations are almost double the overall private employer rate at 4.74%. Other industries and occupations among Virginia self-insureds are more neutral in terms of risk of RSI. On balance, given the relatively lower risk of RSI among government employment generally, and the high proportion of government employment among Virginia self-insured employers, we estimate that the RSI frequency would be at or below the overall national frequency.

Medical data from NCCI contains insurer reports of paid claims and amounts based on primary ICD10 diagnostic codes and procedure codes. (Secondary ICD10 codes also show cause but there were insufficient counts for the secondary codes to be meaningful.) We used paid share for certain diagnoses relevant to RSI (e.g., carpal tunnel syndrome, synovitis, tenosynovitis) to compare Virginia's paid share with regional and national data. We have confidence that the medical data is of very good quality and accurately records the amounts paid for various treatments as of a given date.

Insurers and self-insureds also report injuries to states via electronic data interchange (EDI) standards licensed by the International Association of Industrial Accident Boards and Commissions. These reports are for both accepted and denied claims. Reports include nature of injury and cause of injury codes based on WCIO, which is the same standard as used in unit data reports described above. Thus, it is subject to the same qualifications and potential for coding errors as unit data. Importantly, the NCCI unit data shows paid claims, whereas EDI includes both paid and denied claims, similar to BLS data. We used EDI data from the following states: Virginia, Kansas, Kentucky, Louisiana, Pennsylvania, and Tennessee. The EDI data standards are rigorous, but NCCI data is more comprehensive as it involves all paid claims, whereas EDI reporting requirements may exclude certain classes of claims, such as medical-only claims. NCCI was our primary source of data to make consistent estimates of medical and indemnity cost for RSI claims broken down for Virginia, the region around Virginia, and a national scope. No other industry wide source combines reasonably reliable coding on the nature of injury with claim payment data. Using these data, we were able to construct the two building blocks for our cost estimates: 1) claims that are coded RSI as a percentage of total claims; and 2) the average indemnity and average medical payments over a sample of years associated with those claims. The sample years were from accident years (AY) 2014 through 2018. The cumulative payments to date for each year were extracted September 2020.

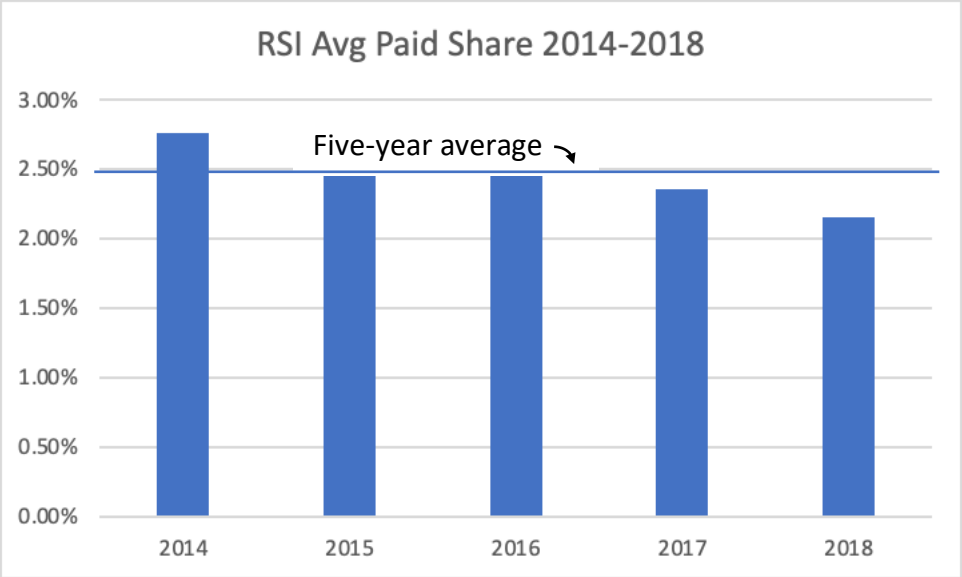
The number of RSI claims we project for Virginia under broadened coverage is derived from the frequency of such claims in two groups of states. The first is the region around Virginia (D.C., Kentucky, and Maryland) and the second is a countrywide group of 36 states plus D.C. We believe that the frequency of RSI claims in a sample of states is the best analogy of loss experience in Virginia. We relied primarily on the national sample in forming estimates. The regional sample was used as a "sanity check" to confirm no unusual outlier situations should be factored into the estimates. The region in which Virginia is grouped is a rather arbitrary collection of states that were not specifically chosen for commonality in their workers' compensation systems or composition of their economies. Having some contiguous border with Virginia seems to be the major selection criteria; putting Tennessee, North Carolina, and West Virginia in other regions illustrates the arbitrary nature of the region in which Virginia is grouped. For the share of total claims reported as RSI, the regional results for RSI (1.9%) were a little lower than national results (2.1%). For the share of total cost from RSI, we relied on paid share, with regional (2.47%) and national (2.49%) results very close.

We also estimated cost per RSI claim using the NCCI unit data and relied on national results. We compared the national results with the region as a test of reasonableness. For cost per claim we used 2014 AY claim costs (pulled as of September 2020), added a factor based on cost trends to adjust to a baseline year of 2020, and applied a "development factor" (discussed further below). Before adjustment, regional results per claim for RSI were $12,441 vs. national results of $13,769. Thus, similar to the rate of RSI among claims, regional results were a little lower than national results. In summary, using national results provides somewhat more conservative estimates based on a larger sample of state experience.

Claim Development

Insurance is unlike most other products in that the seller (insurer) really doesn't know for sure what the cost of selling policies will be until many years after they are sold. Workers' compensation is one of the hardest insurance products to forecast what policy benefits for claims will ultimately cost. Our task of estimating cost similarly shares this uncertainty over how cost will develop over many years. To estimate the average recent share of RSI costs in proportion to total costs, we averaged the paid-to-date indemnity and medical costs for the five cumulative years 2014 through 2018. The cumulative costs in any accident year will develop (usually grow) from one year to the next. If the RSI claims ultimately develop to be more costly or less costly than other (non RSI) claims, then their share of total claim costs would also be greater or reduced, respectively. We have no evidence, however, that RSI will experience average ultimate development that is significantly different from other workers' compensation claims. The 2014 AY claims, which would have approximately 6 years of development as of September 2020, had a paid share of 2.76% which was very close to the five-year average of 2.49%. The figure below shows average paid share for RSI for claims in AY 2014-18, as of September 2020. Note that the share of RSI to total claim cost is declining, which suggests that RSI costs are growing more slowly than non-RSI claims. An important caveat: the five years are at different periods of development so the declining share is a preliminary finding.

Figure 5: Average Share of RSI to All Claims



Cost per claim requires additional analysis to estimate the ultimate total cost of an RSI claim. This estimation is important in understanding total impact of the change to add RSI coverage: the number of estimated additional claims multiplied by the estimated average cost for such claims provides a total cost estimate for the change.

The actuarial process for developing historic paid data for an accident year to its ultimate level is quite refined and requires copious data. It was beyond the scope of this study to do a full loss development study. Instead, we used a judgmental loss development based on our studies of workers' compensation costs. Thus, we used the average cost of indemnity and medical payments per claim for AY2014 as of September 2020. To this average paid cost we added an additional amount to reflect "development" in costs over the next few years.[26] We then applied a factor to this developed cost to account for the trend in average indemnity and medical cost from 2014 to 2020. This is analogous to bringing 2014 home prices or wage rates up to the same nominal dollar levels as 2020. We based this adjustment on medical and indemnity cost growth from 2014-2018. To get a bearing on average cost trends we examined NCCI State Advisory Forum reports for Virginia, which reported average indemnity and medical severity for several years. The 2020 report showed average indemnity severity increased from 2014 to 2018 by approximately 10% and average medical severity was more or less "flat" over the same

[26] We note that claims can be late reported if the injury or disease is slow to materialize in a diagnosis. Some states allow disease claims to be first reported as long as five years after last injurious exposure. Thus, in our 2014 sample year there is probably some "Incurred but Not Reported" claim liability. We anticipate that many RSI involving musculoskeletal injury, like bursitis and tendinitis, would likely become symptomatic and involve treatment and diagnosis during the period when the employee is engaged in repetitive work activities, and for this reason would not likely be latent like some other occupational disease conditions involving exposure to particles or carcinogens. Regardless, there may be incurred-but-not-reported liability in our 2014 census of claims, but likely not an amount that would significantly affect our findings.

period, which further confirms the recent downward trend in Virginia in medical severity mentioned earlier.

To reiterate some of the key assumptions used in this methodology over and above the data caveats listed above:

- *We assume that Virginia will be typical in how stringently it allows claims for RSI, as compared to other states.* The cost impact is controlled by the scope of coverage permitted by the new law and the way claims managers and the VWCC and courts adjudicate disputes. Given identical statutes, two states will have substantial cost differences depending on how liberal or strict adjudicators are in deciding standards for meeting the burden of proof.
- *We assume that Virginia will continue to provide current claim management tools.* In particular, the use of employer physician panels has been frequently cited as a key cost control mechanism.
- *We use loss experience in other states as the vehicle for estimating anticipated cost in Virginia.* This can be misleading if one does not take into consideration the particular mix of employment in Virginia relative to the "benchmark" states. Virginia does have some relatively unique aspects of its employment mix (e.g., high shares of employment in Business and Financial Operations and Office and Administrative Support), but overall its mix of employment by major industry groups does not suggest that Virginia is unusually laden with jobs at high risk of RSI (e.g., manufacturing and transportation).
- *We assume Virginia's average medical costs for treating RSI injuries will be equivalent to the experience of other states after a baseline adjustment to reflect Virginia's higher medical costs.* Virginia's medical costs historically have been relatively high compared to most other states. However, Virginia's relative costs appear to be moving in the direction of the central tendency of average state costs. This is attributed to the Virginia medical fee schedule, first implemented in 2018. Thus, we consider how the average treatment cost for typical RSI in other states, adjusted at baseline to match Virginia's higher pre-fee schedule medical costs, might be used as an estimate for what could apply to such claims in Virginia with the new fee schedule in place.
- *We assume the experience of self-insurers will be comparable to the insured experience in terms of the fraction of claims that are caused by RSI.* This does not mean that we are equating the incidence rates of RSI claims for self-insurers with that for insured employers. To test this assumption we looked at the mix of job types among Virginia self-insured employers, and found that the share of industries and occupations at higher risk of RSI was low compared to the industries and occupations are lower risk of RSI. Finally, this analysis does not take into account the potentially better results in loss prevention typically experienced by self-insured employers.[27]

[27] If hypothetically Virginia self-insured employers were proportionally more involved in the type of work activities more prone to RSI, then they would bear a larger share of the overall increase from expanding coverage. Distributing estimated results across industry types is beyond the scope of this report, however.

- *We assume that frequency trends in RSI will be stable in coming years.* We have not assumed any growth or reduction in the frequency of RSI injuries compared to the years sampled to the year of our cost estimate (2020). We note that recent results from BLS might indicate a downward trend in reported RSI; between 2011 and 2018, national reported RSI involving lost time showed an average annual decrease of approximately 7%. The BLS trend closely tracks NCCI frequency data. In Virginia, the frequency of workers' compensation lost-time claims declined in 10 of the last 14 years, and the national average annual decrease from 1999 to 2018 was 3.8%.[28] Decreases in claim frequency are consistently seen across industry groups as well as among nature of injury groups; lost time claims due to occupational disease/cumulative injuries have shown consistent frequency decreases since 2006, and dropped an average of roughly 8-9% over the five-year period from 2013 to 2018.[29]

Summary

The best available workers' compensation data has limitations, described earlier. Our estimates of the potential level of repetitive stress injuries and their cost in Virginia are based on inferences made from several data sources, and testing results through secondary research and stakeholder interviews. We have in the report indicated the uncertainties of these projections. What becomes clear, even within this range of possibilities, is that the cost to payers in the workers' compensation system is relatively small. Moreover, as we have said previously, the number of compensable RSI injuries is a direct function of how well the new statute is crafted, how consistently the new statute is interpreted in litigation, and how employers respond with preventative measures against RSI.

[28] *See* NCCI, *State Advisory Forums 2019 (Virginia)* at 24 & NCCI, *State of the Line Report (2020)* (available at https://www.ncci.com/Articles/Documents/AIS2020-SOTL-Presentation.pdf).

[29] *See* NCCI, *Workers Compensation Claim Frequency – 2012 Update* at 31; NCCI, *Workers Compensation Claim Frequency – 2014 Update*, at 8; & NCCI, *State of the Line Report (2020)* (Note that the 2020 report from NCCI also indicates that occupational disease/cumulative injury conditions represent a relatively small percentage of lost time claims over that period since 2013).