STATE OF MINNESOTA

IN SUPREME COURT

A18-1131

Workers' Compensation Court of Appeals — Chutich, J.

William H. Johnson,

Respondent,

vs.

Filed: April 24, 2019
Office of Appellate Courts

Darchuks Fabrication, Inc. and
Harleysville Insurance Company,

Relators,

and

Injured Workers Pharmacy,

Intervenor.

Charles M. Cochrane, Cochrane Law Office, P.A., Roseville, Minnesota, for respondent.

Emily A. LaCourse, Christine L. Tuft, Arthur, Chapman, Kettering, Smetak & Pikala, P.A., Minneapolis, Minnesota, for relators.

S Y L L A B U S

1. The treatment parameters established under the workers' compensation act in Minnesota Rule 5221.6020, subpart 2 (2017), apply to treatment of an injury after

liability has been established but do not apply when liability for the compensation benefits owed for an injury has been denied.

2. An employer that contests its obligation to pay for medical treatment for an employee injury that the employer admits is covered by the workers' compensation act has not "denied liability for the injury" within the meaning of Minnesota Rule 5221.6020, subpart 2.

Reversed and remanded.

O P I N I O N

CHUTICH, Justice.

This case considers whether the medical treatment parameters established under the workers' compensation act apply to an employee's claim for reimbursement of medical expenses that the employer contends are not reasonably necessary. Minnesota Rule 5221.6020, subpart 2 (2017), states that the treatment parameters "do not apply to treatment of an injury after an insurer has denied liability for the injury." Relying on this rule, the Workers' Compensation Court of Appeals concluded that the treatment parameters do not apply when an employer contests its obligation under the workers' compensation act to pay for an employee's particular medical treatment. We disagree. Accordingly, we reverse the Workers' Compensation Court of Appeals and remand the case to the workers' compensation judge for further proceedings consistent with this opinion.

FACTS

In September 2002, employee William Johnson suffered a right ankle injury when he stepped on a piece of scrap metal while working for Darchuks Fabrication, Inc. Within

a short period, Johnson developed sharp pain and burning sensations that progressed up his right leg. These symptoms persisted and, eventually, Johnson was diagnosed with a condition known as "complex regional pain syndrome," which is recognized and governed by the workers' compensation treatment parameters. *See* Minn. R. 5221.6305 (2017). The condition is characterized by a number of symptoms affecting a person's extremities, including reduced range of motion, swelling, changes in skin texture or color, sensitivity to touch or cold, and abnormal skin temperature regulation. *See id.*, subp. 1.[1]

Since his injury, Johnson has consulted with numerous physicians and medical specialists. Early on, he was prescribed physical therapy and sympathetic blocks,[2] but these treatments did not provide lasting relief. By July 2004, Johnson had developed severe depression that, in addition to his chronic pain, negatively affected his ability to concentrate and focus in his day-to-day life. A 2004 report by one of Johnson's treating physicians concluded that Johnson was "not capable of gainful occupation" and had "not yet reached Maximum Medical Improvement for his work injury." The report recommended consultations with a pain clinic and a program that tried a variety of medications to manage

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[1] Complex regional pain syndrome is related to, and sometimes referenced interchangeably with, reflex sympathetic dystrophy syndrome. *See Complex Regional Pain Syndrome—Symptoms & Causes*, Mayo Clinic Patient Care & Health Information, https://www.mayoclinic.org/diseases-conditions (last visited Apr. 19, 2019) [opinion attachment]. According to the Mayo Clinic, these conditions are not well understood, and "[s]ymptoms may change over time and vary from person to person." *See id.* Although not appearing in the treatment parameters' list of symptoms, the condition may also include chronic paresthesias (tingling or pricking sensations), changes in hair and nail growth, and muscle atrophy. *See id.* For some, the condition is "irreversible." *Id.*

[2] Sympathetic blocks are injections of anesthetics intended to relieve pain. *Complex Regional Pain Syndrome*, *supra* n.1.

his pain and improve his quality of life. The report also noted that Johnson's condition may be a lifetime disorder. The record shows that Johnson's symptoms have consistently included paresthesias, hypersensitivity, intolerance to heat and cold, skin atrophy, and pain with physical activity. His pain is always present, and he experiences difficulty sleeping without medication. Johnson has not been able to return to work since his injury.

After his injury, Johnson sought workers' compensation benefits. In 2004, the parties reached an agreement and entered into a stipulation to settle Johnson's claim for benefits. Under the agreement, Darchuks accepted workers' compensation liability for the ankle injury and, in addition to making a lump-sum payment, agreed to pay ongoing medical expenses that were reasonably required to cure and relieve Johnson's symptoms.[3] In accord with the stipulation, Darchuks paid for Johnson's medical treatment until the dispute at issue here arose, when Darchuks determined in July 2016 that Johnson's current treatment was no longer reasonable or necessary.

Since 2005, Johnson has received treatment from his current physician, a general practitioner. He has not consulted with a pain specialist, as was previously recommended by a former treating physician. Over the years, Johnson's physician has prescribed a combination of medications that include muscle relaxers, calcium channel blockers, nerve medications, sleep medications, opioid analgesics, and anti-anxiety medications. With

[3] Each of the parties quotes language from the 2004 settlement agreement, but the agreement was not entered in the record below and was not submitted in the briefing to our court. At oral argument, however, Darchuks' counsel represented that Darchuks "accepted liability" for Johnson's injury. Accordingly, the precise terms of the settlement are not material to our analysis.

these medications, Johnson appears to have achieved some measure of control over his symptoms—but has never been able to eliminate the symptoms altogether.

Despite the stability of Johnson's symptoms, his ability to manage daily life has slowly declined. According to his medical records, for example, Johnson's capacity to do household chores and outside housework diminished between 2013 and 2015. During this period he also reported increased difficulty with daily exercise because of the pain. In October 2016, Johnson told his physician that his pain completely interferes with his general activity and sleep on a regular basis.

Presently, Johnson's treatment regime consists of five medications: Endocet (an opioid for pain), lorazepam (an anti-anxiety medication), nifedipine (to reduce contractions in his blood vessels in his leg), Neurontin (a brand-name medication for nerve pain), and cyclobenzaprine (to treat muscle spasms). Aside from changes in dosage prescribed by Johnson's physician, this treatment regime has remained unchanged for more than ten years. Johnson has a check-up with his physician every three months. As required by the treatment parameters, Johnson has signed and complied with a narcotic medication contract for his opioid prescription.[4] *See* Minn. R. 5221.6110, subp. 7 (2017).

In May 2016, Darchuks requested that Johnson undergo an independent medical examination. It was the fourth independent medical examination conducted since Johnson's initial injury in 2002. Until then, every physician who had examined Johnson

[4] The workers' compensation judge noted "one isolated exception" to Johnson's record of compliance, but did not describe the incident in his findings. Nothing in the record suggests that Johnson is abusing any of his medications.

agreed with his complex regional pain syndrome diagnosis and agreed that the condition is causally related to Johnson's workplace ankle injury. The May 2016 report, however, cast doubt on the source of Johnson's symptoms and the complex regional pain syndrome diagnosis.

Based on the May 2016 report, Darchuks advised Johnson's physician in a letter denial[5] that it was discontinuing coverage for treatment and medication for Johnson's complex regional pain syndrome. In that letter, Darchuks asked Johnson's physician to begin a plan within 30 days to wean Johnson from the opioid Endocet and bring his treatment into alignment with the treatment parameters governing long-term use of opioid medications. *See* Minn. R. 5221.6110. Johnson's physician did not put a compliance plan in place, however. The physician's progress notes in October 2016 stated that Johnson's symptoms persisted, but that his current combination of prescription medications provided better outcomes than other combinations that had been tried over the years.

Darchuks' letter denial suspended its payment of medication expenses. Thus, in November 2016, Johnson filed a workers' compensation medical request seeking payment to cover the cost of his medications. Darchuks denied the request for payment. Relying on the findings of the May 2016 independent medical examination, Darchuks contended that Johnson's complex regional pain syndrome had resolved. Darchuks asserted, moreover, that it was not obligated to pay for Johnson's treatment because it was not

[5] When an employer has accepted primary liability but denies liability for a portion of benefits, it must do so in a "letter denial" that satisfies the requirements of the workers' compensation rules of practice. *See* Minn. R. 5220.2570, subp. 5 (2017).

reasonable or necessary and his continuing medication treatment was not compliant with the workers' compensation treatment parameters for long-term treatment with opioid analgesic medication. *See* Minn. R. 5221.6110.[6] Rule 5221.6110 sets forth detailed substantive and procedural requirements that physicians must follow in treating workers' compensation patients with opioid pain medications, including documentation, patient selection criteria, risk assessment, ongoing treatment monitoring, and a written treatment contract. *See generally id*. The rules also provide specific parameters for the treatment of complex regional pain syndrome. *See* Minn. R. 5221.6305.

A formal hearing was held before a workers' compensation judge on July 21, 2017. After reviewing the reports submitted by Johnson's physician, the judge found Johnson's testimony to be credible, concluded that Johnson's diagnosis was correct, implicitly concluded that it was causally connected to Johnson's workplace injury, and found that his condition had not resolved. The judge also concluded that, by asserting that Johnson's complex regional pain syndrome had resolved, Darchuks had in effect "denied liability" for Johnson's injury. Consequently, the judge held that the treatment parameters did not apply to Johnson's claim. *See* Minn. R. 5221.6020, subp. 2. Darchuks was ordered to pay for Johnson's medications and treatment, which the judge concluded were "reasonable and necessary to cure and relieve the effects of [Johnson's] work injury."

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[6] The workers' compensation tribunals never addressed whether Johnson's treatment plan complied with the treatment parameters because they concluded that the parameters did not apply to Johnson's request for reimbursement.

On appeal to the Workers' Compensation Court of Appeals, Darchuks argued that the compensation judge misunderstood its position. According to Darchuks, it continues to accept responsibility for the reasonable and necessary treatment for Johnson's injury; therefore, it has not triggered the bar under Rule 5221.6020, subpart 2, preventing application of the treatment parameters. The Workers' Compensation Court of Appeals rejected Darchuks' argument and affirmed the compensation judge's decision.

Before this court, Darchuks does not challenge the compensation judge's finding that Johnson suffers from complex regional pain syndrome that is causally related to his work-related ankle injury. Nor does Darchuks challenge the finding that Johnson's condition has not resolved. Darchuks' only contention on appeal is that the workers' compensation tribunals erred in concluding that the treatment parameters do not apply to Johnson's course of treatment. Accordingly, our review is limited to that question alone.

ANALYSIS

The workers' compensation act requires an employer to furnish medical treatment that is "reasonably . . . required . . . to cure and relieve from the effects" of a workplace injury. Minn. Stat. § 176.135, subd. 1(a) (2018). The Minnesota Department of Labor & Industry ("Department"), in conjunction with the workers' compensation Medical Services Review Board, promulgates standards setting forth "reasonable" medical treatment under the act. *See* Minn. Stat. § 176.83, subd. 5 (2018); *Jacka v. Coca-Cola Bottling Co.*, 580 N.W.2d 27, 35 (Minn. 1998). These standards, termed "treatment parameters," *Pelowski v. K-Mart Corp.*, 627 N.W.2d 89, 92–93 (Minn. 2001), must be "based upon accepted medical standards for quality health care and accepted rehabilitation standards,"

Minn. Stat. § 176.83, subd. 5, and are meant to control costs for compensable medical treatment. *See* Minn. R. 5221.6020, subp. 1.

The treatment parameters function as a "yardstick by which the treatment offered by the health care provider is measured." *Jacka*, 580 N.W.2d at 35. The workers' compensation statute allows a workers' compensation insurer to withhold payment if it determines "that the level, frequency, or cost of a procedure or service of a [health care] provider is excessive, unnecessary, or inappropriate according to the standards established" by the treatment parameters, "unless the commissioner or compensation judge determines at a hearing" that the treatment "was not excessive under the rules."[7] Minn. Stat. § 176.83, subd. 5(c).

The rules provide that the treatment parameters do *not* apply to treatment if the employer "denied liability for the injury." Minn. R. 5221.6020, subp. 2. But even if an employer denies liability, the treatment parameters "*do* apply to treatment initiated after liability has been established." *Id.* (emphasis added).

Here, we are asked to determine whether Darchuks "denied liability" when, after the fourth independent medical examination questioned the reasonableness of the ongoing medication regime, it denied payment of Johnson's medical request. Stated differently, the

[7] We have also held that the treatment parameters do not bind the compensation judge's inherent discretion to "depart from the rules in those rare cases in which departure is necessary to obtain proper treatment." *Jacka*, 580 N.W.2d at 35–36. And though the *rules* established by the Department provide some circumstances under which it is permissible to depart from the treatment parameters, *see* Minn. R. 5221.6050, subp. 8 (2017), we have recognized that the workers' compensation *statute* provides the compensation judge with flexibility to conclude that a departure from the parameters is reasonable and necessary in an "exceptional circumstance." *Jacka*, 580 N.W.2d at 35–36.

question here is whether Darchuks lost the right to invoke the treatment parameters to challenge coverage for the treatment regime prescribed by Johnson's physician when it objected to the latest medical payment request. To resolve this question, we must first interpret the phrase "denied liability" in Minnesota Rule 5221.6020, subpart 2. We then apply our interpretation to the circumstances here.

I.

The meaning of an administrative rule is a question of law that we review de novo. *J.D. Donovan, Inc. v. Minn. Dep't of Transp.*, 878 N.W.2d 1, 5 (Minn. 2016). When a question is raised about the interpretation of the Minnesota Rules, the principles of statutory interpretation apply. *Id.* The first step is to determine whether the language of the contested rule "is subject to more than one reasonable interpretation." *State v. Fleck*, 810 N.W.2d 303, 307 (Minn. 2012). If so, the rule is ambiguous. *Id.* But if the rule is not ambiguous, we construe the rule "as a whole and the words and sentences therein are understood . . . in light of their context." *Schmidt ex rel. P.M.S. v. Coons*, 818 N.W.2d 523, 527 (Minn. 2012) (internal quotation marks omitted) (citation omitted).

Rule 5221.6020, subpart 2, which governs the application of the treatment parameters generally, provides that the treatment parameters "do not apply to treatment of an injury *after* an employer has *denied liability for the injury*." Minn. R. 5221.6020, subp. 2 (emphasis added). The key phrase here is "denied liability for the injury" because it describes the condition that must be satisfied to trigger the rule. The verb "deny" has a straightforward and clear meaning: to disclaim responsibility for, or to refuse to accept the validity of, some proposition. *See Webster's Third New International Dictionary* 603

(1976) (second and sixth entries). The phrase "liability for the injury" carries a particular meaning under the workers' compensation act, however. The act makes every employer "liable to pay compensation in every case of personal injury or death of an employee arising out of and in the course of employment." Minn. Stat. § 176.021, subd. 1. Section 176.021 uses the term "liability" synonymously with the word "obligation." *See Liability*, *Black's Law Dictionary* (10th ed. 2014). The obligation that the act imposes on employers is to pay the compensation set forth in the statute when an employee suffers an injury that is covered under the act. *See* Minn. Stat. § 176.021 (2018) (defining an employer's liability); *see also id.* § 176.011, subd. 16 (2018) (defining personal injury); *id.* § 176.101 (2018) (setting out the compensation schedule under the workers' compensation act).

From this language, we come to the straightforward conclusion that the phrase "liability for the injury" in Rule 5221.6020, subpart 2, refers to the employer's obligation to pay statutory benefits for personal injuries that are covered by the workers' compensation act. Consequently, under Rule 5221.6020, subpart 2, an employer may not invoke the treatment parameters when it denies liability, that is, when the employer claims that it is not obligated to pay compensation for an injury. An employer's denial might occur, for example, when a dispute arises between the parties concerning whether an injury is covered under the act. Under these circumstances, the employer's position disclaims responsibility for any compensation or benefits, as opposed to objecting to a *particular* treatment recommendation or regime. When an employer takes this position, there is no

reason for the treatment parameters to apply unless and until the employer's liability is established.[8]

This interpretation makes sense in light of other language in Rule 5221.6020, subpart 2. The rule provides that, in cases where an employer has denied liability for the employee's injury, the treatment parameters nevertheless "apply to treatment initiated *after liability has been established*." Minn. R. 5221.6020, subp. 2 (emphasis added); *see also* Minn. Stat. § 645.16 (stating that "every law shall be construed . . . to give effect to all its provisions"). Stated differently, once a dispute about an injury is resolved in favor of benefits coverage—by a determination of a compensation judge, stipulation of the parties, or other procedure—the ongoing treatment of the covered injury is then subject to the parameters set forth in the rules.[9] Accordingly, we conclude that the ban on applying the

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[8] As the Workers' Compensation Court of Appeals has aptly explained, " '[w]hen an employer and insurer deny liability for a work injury . . . [they] have no real interest in information about the course of the employee's care and no legitimate expectation of influencing or limiting the employee's treatment options.' " *Schulenburg v. Corn Plus*, 65 W.C.D. 237, 248–49 (Minn. WCCA 2005) (quoting *Mattson v. Nw. Airlines*, 1999 WL 1243053, at *5 (Minn. WCCA Nov. 29, 1999)), *aff'd without opinion*, 696 N.W.2d 790, 791 (Minn. 2005); *see also Oldenburg v. Phillips & Temro Corp.*, 60 W.C.D. 8, 13 (Minn. WCCA 1999). Here, however, Darchuks has steadfastly maintained its interest in Johnson's treatment, asserting in this proceeding only that the current course of treatment for the existing symptoms of Johnson's compensable injury does not comply with the treatment parameters.

[9] Although not necessary for our decision, we note that this interpretation is consistent with the workers' compensation tribunals' own rules of practice. *See* Minn. R. 5220.2510–.2960 (2017). Rule 5220.2570 governs the form that an employer's denial of liability must take. The rule states, "[w]hen an employer or insurer denies liability for a work-related *injury*, it shall serve and file the documents prescribed by this part." *Id.*, subp. 1 (emphasis added). "A denial of *primary liability*," moreover, "must clearly indicate that its purpose is to deny liability for the *entire claim*." *Id.*, subp. 3 (emphasis added). But when the

treatment parameters in Rule 5221.6020, subpart 2, applies only when an employer denies that it has an obligation under the act to pay compensation for an alleged workplace injury.

II.

With this understanding of the rule in mind, we assess whether Darchuks has denied liability for Johnson's injury here. When a question arises about the application of law to undisputed facts, we review it de novo. *Gilbertson v. Williams Dingmann, LLC*, 894 N.W.2d 148, 151 (Minn. 2017). The Workers' Compensation Court of Appeals concluded that the treatment parameters did not apply to Johnson's reimbursement request because Darchuks argued to the compensation judge that Johnson's condition had resolved and that the treatment prescribed by his physician was not reasonable. *Johnson v. Darchuks Fabrication, Inc.*, No. WC17-6114, 2018 WL 3134402, at *3 (Minn. WCCA June 13, 2018). The court reasoned that, by putting Johnson's condition and treatment at issue, Darchuks in effect denied that a causal connection exists between Johnson's work-related ankle injury and his present symptoms.[10] *Id.*

We disagree. It is true that Darchuks contested the validity of Johnson's diagnosis and argued that his medical prescriptions were improper under the treatment parameters.

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employer denies "liability for a portion of benefits or *any other compensation where primary liability has been accepted*," a letter denial explaining the "specific reason for the denial" is sufficient. *Id.*, subp. 5(E) (emphasis added). The rules of practice clearly contemplate the situation presented here: an employer can accept primary liability, but later deny responsibility for specific medical treatment that the employer asserts is not reasonable or necessary, without losing the right to rely on the treatment parameters.

[10] The Workers' Compensation Court of Appeals has held that a denial of medical causation is a denial of liability for an injury. *See Schulenburg*, 65 W.C.D. at 247–49.

But the bar against applying the treatment parameters is triggered only when an employer denies liability for an *injury*. Minn. R. 5221.6020, subp. 2. Darchuks has admitted—and continues to admit—that Johnson suffered a workplace ankle injury. It also admits that Johnson has not fully recovered from this injury, and that it has a continuing liability to cure and relieve the injury. Darchuks, therefore, agrees that it has an obligation to pay for ongoing medical treatment as required under the workers' compensation act. Consequently, it has not denied liability for Johnson's injury. *See id.*

Johnson responds that, because complex regional pain syndrome is the only remaining diagnosis related to his workplace injury, when Darchuks asserted that the condition had resolved, it was a denial of liability for the injury. On this record, however, Johnson's argument is moot. The compensation judge expressly found that Johnson was correctly diagnosed with complex regional pain syndrome, the syndrome was causally related to his workplace ankle injury, and the condition has not resolved. Those factual findings were upheld on appeal, and, critically, Darchuks has not challenged them in this court.[11] *See, e.g.*, *County of Hennepin v. Mikulay*, 194 N.W.2d 259, 262 (Minn. 1972) (noting that an issue is moot when the court has nothing to decide).

Here, Darchuks asserts only that it is not obligated to pay for the treatment prescribed by Johnson's physician. This assertion follows from its position that Johnson's treatment does not comply with the treatment parameters because it is not reasonable and necessary. Darchuks is entitled to make that argument to the workers' compensation judge,

[11] At oral argument, in fact, Darchuks expressly stated that it accepts the compensation judge's finding that Johnson suffers from complex regional pain syndrome.

as it did here. *Cf. Jacka*, 580 N.W.2d at 32 ("[T]he compensation judge is responsible for determining whether medical treatment is 'reasonably required' within the scope of Minn. Stat. § 176.135, subd. 1."). And, in doing so, it did not renege on its 2004 agreement with Johnson that Johnson suffered a work-related injury for which it is obligated to pay compensation under the act.[12]

Because Darchuks does not contest its liability to pay for treatment that is reasonably required to cure and relieve the effects of Johnson's workplace ankle injury, it has not "denied liability for the injury" under Rule 5221.6020, subpart 2. Rather, the treatment parameters apply to Johnson's medical request because the workers' compensation tribunals have established that Johnson suffers from complex regional pain syndrome, his condition is causally related to his workplace ankle injury, and his condition has not resolved. *See id.* (stating that the treatment parameters apply "to treatment initiated after liability has been established"). We therefore reverse the decision of the Workers' Compensation Court of Appeals.

[12] It might be a different case if Darchuks had asserted that Johnson no longer suffered from *any* symptoms causally connected to his work-related ankle injury. *Compare Mattson*, 1999 WL 1243053, at * 5 (noting that treatment parameters do not apply when employer denied that employee's current condition was causally related to the work injury), *with Wolfe v. Wesi Johnson Screens*, 2002 WL 1400043, at * 7 (Minn. WCCA June 6, 2002) (noting that treatment parameters applied when employer contested a diagnosis, but did not contest its liability for the work injury). But here, Darchuks has not argued that Johnson's ankle injury has resolved.

CONCLUSION

For the foregoing reasons, we reverse the decision of the Workers' Compensation Court of Appeals and remand the case to the workers' compensation judge for further proceedings consistent with this opinion.

Reversed and remanded.

Complex regional pain syndrome

Overview

Complex regional pain syndrome (CRPS) is a form of chronic pain that usually affects an arm or a leg. CRPS typically develops after an injury, a surgery, a stroke or a heart attack. The pain is out of proportion to the severity of the initial injury.

Complex regional pain syndrome is uncommon, and its cause isn't clearly understood. Treatment is most effective when started early. In such cases, improvement and even remission are possible.

Symptoms

Signs and symptoms of complex regional pain syndrome include:

- Continuous burning or throbbing pain, usually in your arm, leg, hand or foot
- Sensitivity to touch or cold
- Swelling of the painful area
- Changes in skin temperature — alternating between sweaty and cold
- Changes in skin color, ranging from white and mottled to red or blue
- Changes in skin texture, which may become tender, thin or shiny in the affected area
- Changes in hair and nail growth
- Joint stiffness, swelling and damage
- Muscle spasms, tremors, weakness and loss (atrophy)
- Decreased ability to move the affected body part

Symptoms may change over time and vary from person to person. Pain, swelling, redness, noticeable changes in temperature and hypersensitivity (particularly to cold and touch) usually occur first.

Over time, the affected limb can become cold and pale. It may undergo skin and nail changes as well as muscle spasms and tightening. Once these changes occur, the condition is often irreversible.

Complex regional pain syndrome occasionally may spread from its source to elsewhere in your body, such as the opposite limb.

In some people, signs and symptoms of complex regional pain syndrome go away on their own. In others, signs and symptoms may persist for months to years. Treatment is likely to be most effective when started early in the course of the illness.

When to see a doctor

If you experience constant, severe pain that affects a limb and makes touching or moving that limb seem intolerable, see your doctor to determine the cause. It's important to treat complex regional pain syndrome early.

Causes

The cause of complex regional pain syndrome isn't completely understood. It's thought to be caused by an injury to or an abnormality of the peripheral and central nervous systems. CRPS typically occurs as a result of a trauma or an injury.

Complex regional pain syndrome occurs in two types, with similar signs and symptoms, but different causes:

- **Type 1.** Also known as reflex sympathetic dystrophy syndrome (RSD), this type occurs after an illness or injury that didn't directly damage the nerves in your affected limb. About 90 percent of people with complex regional pain syndrome have type 1.
- **Type 2.** Once referred to as causalgia, this type has similar symptoms to type 1. But type 2 complex regional pain syndrome follows a distinct nerve injury.

Many cases of complex regional pain syndrome occur after a forceful trauma to an arm or a leg. This can include a crushing injury, fracture or amputation.

Other major and minor traumas — such as surgery, heart attacks, infections and even sprained ankles — can also lead to complex regional pain syndrome.

It's not well-understood why these injuries can trigger complex regional pain syndrome. Not everyone who has such an injury will go on to develop complex regional pain syndrome. It might be due to a dysfunctional interaction between your central and peripheral nervous systems and inappropriate inflammatory responses.

Complications

If complex regional pain syndrome isn't diagnosed and treated early, the disease may progress to more-disabling signs and symptoms. These may include:

- **Tissue wasting (atrophy).** Your skin, bones and muscles may begin to deteriorate and weaken if you avoid or have trouble moving an arm or a leg because of pain or stiffness.
- **Muscle tightening (contracture).** You also may experience tightening of your muscles. This may lead to a condition in which your hand and fingers or your foot and toes contract into a fixed position.

Prevention

These steps might help you reduce the risk of developing complex regional pain syndrome:

- **Taking vitamin C after a wrist fracture.** Studies have shown that people who took a daily minimum dose of 500 milligrams (mg) of vitamin C after a wrist fracture had a lower risk of complex regional pain syndrome compared with those who didn't take vitamin C.
- **Early mobilization after a stroke.** Some research suggests that people who get out of bed and walk around soon after a stroke (early mobilization) lower their risk of complex regional pain syndrome.

By Mayo Clinic Staff

Complex regional pain syndrome

Diagnosis

Diagnosis of complex regional pain syndrome is based on a physical exam and your medical history. There's no single test that can definitively diagnose complex regional pain syndrome, but the following procedures may provide important clues:

- **Bone scan.** This procedure might help find bone changes. A radioactive substance injected into one of your veins allows your bones to be seen with a special camera.
- **Sympathetic nervous system tests.** These tests look for disturbances in your sympathetic nervous system. For example, thermography measures the skin temperature and blood flow of your affected and unaffected limbs.

  Other tests can measure the amount of sweat on both limbs. Uneven results can indicate complex regional pain syndrome.
- **X-rays.** Loss of minerals from your bones may show up on an X-ray in later stages of the disease.
- **Magnetic resonance imaging (MRI).** Images captured by an MRI test may show a number of tissue changes.

Treatment

There's some evidence that early treatment, within the first few months of symptoms, might help improve complex regional pain syndrome symptoms. Often, a combination of different treatments, tailored to your specific case, is necessary. Treatment options include:

Medications

Doctors use various medications to treat the symptoms of complex regional pain syndrome.

- **Pain relievers.** Over-the-counter (OTC) pain relievers — such as aspirin, ibuprofen (Advil, Motrin IB, others) and naproxen sodium (Aleve) — may ease mild pain and inflammation.

  Your doctor may prescribe stronger pain relievers if OTC ones aren't helpful. Opioid medications might be an option. Taken in appropriate doses, they might help control pain.
- **Antidepressants and anticonvulsants.** Sometimes antidepressants, such as amitriptyline, and anticonvulsants, such as gabapentin (Neurontin), are used to treat pain that originates from a damaged nerve (neuropathic pain).
- **Corticosteroids.** Steroid medications, such as prednisone, may reduce inflammation and improve mobility in the affected limb.
- **Bone-loss medications.** Your doctor may suggest medications to prevent or stall bone loss, such as alendronate (Fosamax) and calcitonin (Miacalcin).
- **Sympathetic nerve-blocking medication.** Injection of an anesthetic to block pain fibers in the affected nerves may relieve pain in some people.
- **Intravenous ketamine.** Some studies show that low doses of intravenous ketamine, a strong anesthetic, may substantially alleviate pain. However, despite pain relief, there was no improvement in function.

Therapies

- **Heat therapy.** Applying heat may offer relief of swelling and discomfort on skin that feels cool.
- **Topical analgesics.** Various topical treatments are available that may reduce hypersensitivity, such as over-the-counter capsaicin cream, or lidocaine cream or patches (Lidoderm, LMX 4, LMX 5).
- **Physical therapy.** Gentle, guided exercising of the affected limbs might help decrease pain and improve range of motion and strength. The earlier the disease is diagnosed, the more effective exercises might be.
- **Mirror therapy.** This type of therapy uses a mirror to help trick the brain. Sitting before a mirror or mirror box, you move the healthy limb so that the brain perceives it as the limb that is affected by CRPS. Research shows that this type of therapy might help improve function and reduce pain for those with CRPS.
- **Transcutaneous electrical nerve stimulation (TENS).** Chronic pain is sometimes eased by applying electrical impulses to nerve endings.
- **Biofeedback.** In some cases, learning biofeedback techniques may help. In biofeedback, you learn to become more aware of your body so that you can relax your body and relieve pain.
- **Spinal cord stimulation.** Your doctor inserts tiny electrodes along your spinal cord. A small electrical current delivered to the spinal cord results in pain relief.
- **Intrathecal drug pumps.** In this therapy, medications that relieve pain are pumped into the spinal cord fluid.

It's possible for complex regional pain syndrome to recur, sometimes due to a trigger such as exposure to cold or an intense emotional stressor. Recurrences may be treated with small doses of an antidepressant or other medication.