



Canada's Drug Agency
L'Agence des médicaments du Canada

CDA-AMC REIMBURSEMENT REVIEW

Patient and Clinician Group Input

burosumab (Crysvita)
(Kyowa Kirin Canada, Inc.)

Indication: For the treatment of X-linked hypophosphataemia (XLH) in adult patients.

January 12, 2024

This document compiles the input submitted by patient groups and clinician groups for the file under review. The information is used by CDA-AMC in all phases of the review, including the appraisal of evidence and interpretation of the results. The input submitted for each review is also included in the briefing materials that are sent to expert committee members prior to committee meetings. **If your group has submitted input that is not reflected within this document, please contact Formulary-Support@cda-amc.ca.**

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Patient Input

Name of Drug: **Burosumab “Crysvita”**

Indication: **X-linked Hypophosphatemia**

Name of Patient Group: **Canadian XLH Network**

Author of Submission: **Shari Van Vugt and Danielle Steenbergen**

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1. About Your Patient Group

The Canadian XLH Network is a national Not for Profit. The mission of the Canadian XLH Network is to work as a collective to raise awareness surrounding XLH and advocate for patients; to ensure all Canadians have access to the best possible treatment(s); to promote education amongst health care professionals, affected families and the public surrounding XLH; to collaborate with other like-minded organizations and to support affected individuals across Canada, and their families, to ensure they are coping and have a better understanding of the disease. For more information about our organization, please visit our website at canadianxlhnetwork.org

2. Information Gathering

The Canadian XLH Network conducted an online survey of XLH patients and their family/caregivers between December 2, 2023 - December 15, 2023. Links to the survey were made available on the Canadian XLH Facebook Page, Instagram account and to our closed Facebook group, XLH Canada. Links were also made available via the Facebook accounts of The XLH Network in the United States, XLH Australia (private group). Links to the survey were also made available via Facebook to members of the International XLH Alliance. Members of the IXLHA include XLH groups in India, Argentina, Morocco, Brazil, Romania, Australia, Italy, Austria, Denmark, Germany, Spain, United Kingdom, United States, France, Finland, Portugal, Israel, Russia, Canada, Chile, and the Netherlands. This survey was intended to capture the adult experience with XLH as Burosumab has already been approved for children in Canada. It included multiple choice, rating and open-ended questions. We have included impactful quotes from open-ended questions to provide an understanding of the patients' perspective.

There were 57 responses to the survey. 41 (78%) are Patients/caregivers with Burosumab experience. There are 16 (22%) patients/caregivers with no Burosumab experience. An overwhelming 93% of patients surveyed identified that they are currently presenting with symptoms because of XLH. Treatment of adults with this medication is limited in Canada to a small percentage of patients through private insurance or compassionate care programs. As such, experience provided about this treatment includes responses from many countries. Of the patients who provided their demographic information (see Tables 1 and 2), 46% live in Canada and 88% identify as female, 88% are between the ages of 30 - 59.

Table #1: Country of Survey Respondents (57)

Respondents	CAN	USA	Europe	Other	Total
Patients/Caregivers WITHOUT Burosumab experience	8	3	1	3	15
Patients/Caregivers WITH Burosumab experience	18	19	3	2	42

Table #2: Gender and Age of Survey Respondents

Respondents	Age Range						Gender		
	18-29	30-39	40-49	50-59	60-69	70-79	Female	Male	Prefer to self-describe
Patients/Caregivers WITHOUT Burosumab experience	2	5	1	1	5	2	14	2	0
Patients/Caregivers WITH Burosumab experience	6	10	9	10	6	0	36	4	1

3. Disease Experience

X-linked hypophosphatemia (**XLH**) is a disease that is often misdiagnosed and in some cases not diagnosed until family is diagnosed. Once diagnosed, XLH has typically been treated as a childhood disease with treatment ending when patients have stopped growing. However, **XLH is a progressive disease that affects the whole body, for the patient's entire life.** XLH is a rare genetic disorder (1 in 20,000). 46% of respondents reported being diagnosed with spontaneous cases, 54% reported 2 - 6 generations of XLH affected family members. The majority of the respondents were diagnosed as children. 12% of those surveyed were diagnosed as adults between the ages of 24 - 49 years. One respondent commented:

"I was diagnosed at age 24 when my son was diagnosed at age 2. Previously I was not aware I had XLH. I have suffered from bone pain for as long as I can remember. I had bi lateral tibial osteotomies at age 19. I have been on a disability since 1995."

Burosumab is already approved for children in Canada. This survey was intended to gather information about adult patients with XLH. Specifically, to understand the impact of the disease on adults living with XLH. For this survey, adult patients were asked if there were differences in symptoms they presented as a child versus those they have as an adult. These are symptoms that directly impact quality of life. The consensus was that symptoms in adults differ than those in childhood and are severe and debilitating. Becoming more so as they continue to age. Most patients described multiple symptoms. 100% of respondents answered this question. All indicated having symptoms of XLH as adults that differed from their childhood symptoms. 44% of patients indicated severe pain, 28% loss of mobility, 21% loss of energy/fatigue, 21% had an increase in dental issues (loss of teeth, root canals, failed dental implants), 26% have developed arthritis and/or spinal stenosis. Patients' comments on adult symptoms:

*"What?!!! As an adult the symptoms became *ASTRONOMICALLY* worse. I do not want to get into the details, as a way to keep me pushing through today."*

"It's bone pain and deformities, surgeries, extreme dental pain, dental procedures, dental surgeries, digestion, energy levels, fatigue, problems sleeping, back pain, headaches...and the list goes on. Socially and psychologically, I find it really difficult to know how to explain this — it has a significant impact on you all throughout your life."

"As an adult my mobility has decreased significantly, I walk with walking aids (a walker), I have had double hip surgery at the age of 28. My vertebrae are all fusing together due osteophytes as well as all of my other joints. I walk hunched over due to this as I can not stand fully straight anymore. This all began in my early 20s and progressively got worse over the last 6 years and the negative progression has finally slowed down over the last 2-3 years."

“I am 21 now and it is very painful to run. It is also very painful to walk long distances or stand for a long period of time. I often feel tired after what would be a normal day. If I go on a short trip to the mall, let's say (2hrs) I know it will be painful to walk the remainder of the day and the day after. Due to that I often opt out of events in order to not experience that pain and avoid taking painkillers.”

“Even at the age of 30, my physical capacities were equivalent to those of an 85-year-old. While I could still walk (with a limp) as a child, today as an adult I can no longer even jump, stand on tiptoe or kneel.”

Patients were presented with a list of 10 symptoms that most impact their quality of life and asked to rate their symptoms. The rating scale used was 1 - 5 with 1 – No Issue, 2 - Mild/Rarely, 3 - Moderate/Sometimes, 4 - Severe/Often, 5 - Extremely Severe/Constantly. **(Table 3)**

Table 3: Impact of symptoms that most impact patients’ quality of life (57 respondents)

Rating	No Issue	Mild/Rare	Moderate/ Sometimes	Severe/Often	Extremely Severe/Constantly
Joint Stiffness	1	6	8	25	17
Osteomalacia	1	6	16	10	15
Fatigue/Muscle Pain & weakness	2	2	10	19	25
Tooth Abscesses/dental abscesses	4	10	15	12	16
Deformities of lower limbs	5	11	9	15	17

57 (100%) patients responded to these questions. The majority of these patients 77% are quite you under age 60. 98% of respondents indicated they suffer joint stiffness, 98% of respondents indicated fatigue/muscle pain, 93% are impacted by tooth/dental abscesses, 98% indicated they are impacted by osteomalacia, 91% have deformities of their lower limbs, 67% have had fractures/pseudo fractures, 77% suffer from headaches, 67% have spinal stenosis, 60% suffer from hearing loss, 47% have irregularities in the shape of their head. Patients have reported:

“It's bone pain and deformities, surgeries, extreme dental pain, dental procedures, dental surgeries, digestion, energy levels, fatigue, problems sleeping, back pain, headaches...and the list goes on. Socially and psychologically, I find it really difficult to know how to explain this — it has a significant impact on you all throughout your life.”

“Living with XLH means pain and that in an endless cycle. The muscles are very stiff so that you can't do all the everyday household chores and are dependent on help. The bone and joint pain is always there, but it can get a lot worse. This means that you have to take painkillers all the time. These make it easier to deal with the pain, but you are never pain-free. Due to the daily struggle with pain and stiffness, you are clearly, quickly and almost daily very exhausted. Chronic fatigue is present and this makes everyday life even more difficult. While healthy people have many hours in a day, a day for people with XLH is over in just a few hours as there is no capacity left and you need many breaks to recover. My everyday life at home is severely restricted.”

Impact of XLH on patients’ mental and emotional well-being

Patients were asked how XLH has impacted them (Socially, Psychologically and Financially). 52 patients responded to this open ended question. 19 (37%) indicated that they have suffered socially - unable to keep up with peers, unable to participate in sports, limitations as a result of low self esteem. 21 (40%) indicated an impact on their Psychological well-being listing anxiety, depression, PTSD due to surgeries/ treatments, 4 patients indicated being suicidal due to living with XLH and its symptoms, 32 (62%) indicated that they were financially impacted due to the cost of medication/treatment/dental care, travel to and from appointments and loss of work due to treatment, sick days and disability. Patients' comments regarding their social, mental and emotional wellbeing are difficult to read. See comments below:

"Worst day: I sit in my room and cry leaving my children to my husband because I am really unsure if I want to live anymore. Everything hurts. I am angry at the world and I feel like a total failure because I can't just ignore the pain"

"There is nothing they can do besides knee replacement but they don't want to do that at my age since knee replacements only last 15-20 years(I'm afraid they will have me committed if I told them go for it I have a 5-10 year suicide plan anyway I won't be around that long and it will outlive me - afraid I'll b committed and NO depression med or therapy can heal this kind of pain, so that's useless too). XLH is horrible. 0 out of 10 would not recommend it."

"I don't have a social life. I work because I have to support myself and even though I sit all day, just getting out of bed and to the office is a difficult task. When I am not working I am sleeping. I go days without eating because I'm too sore or exhausted to get up and feed myself. I can sleep 12 hours straight and still feel like I haven't slept in days. I'm constantly dozing off at my desk while I'm working no matter how much sleep I get. I have unimaginable pain and no meds help, not even strong opiates. I have toothaches several days each month and I only have 2 half-molars left. All my other teeth broke off at the gum line. Because of the PAIN (8-10 on the pain scale daily) and the depression of being toothless with no money to afford dentures, I think of suicide DAILY."

"Socially and psychologically, I find it really difficult to know how to explain this — it has a significant impact on you all throughout your life. It can be psychologically exhausting to go through setback after setback, injury after injury, tired day after tired day, losing teeth, missing entire year's of your life because of surgeries. All of this compounds and the effects are deep and omnipresent. It affects your work, your productivity, how much you want to achieve in life, your social life. It's made me want to go to the end of the earth to save my children from having to go through the same things that I've gone through, and what I've seen so many others affected by XLH go through."

"Socially I have been unable to keep up with my friends of the same age, due to limited mobility. I often am too tired to go out or do certain high impact activities that I would like to be able to do. I use a walker which socially has made me uncomfortable and feel judged often out in public for looking young and using a walking aid."

"Mentally it can be draining to feel like your body is constantly failing you or hearing you need another surgery."

4. Experiences With Currently Available Treatments

A combination of Phosphate and Calcitriol is the standard treatment available to adult patients in Canada. Patients take large doses of phosphate up to 5 times daily and Calcitriol 1 to 2 times daily. This treatment addresses the issue of low phosphate, but it does not address other serious symptoms of XLH. Phosphate is expensive and is not covered by private insurance. There are supply chain issues in sourcing phosphate. Long term use causes serious side effects. See table 4

54% of respondents have discontinued use of phosphate upon advice by a physician, 100% of respondents reported having to pay for phosphate out of pocket. 57% of respondents reported this as a financial burden and 7%

noted they had to **skip doses due to financial reasons**. 10% reported issues receiving the drug from the pharmacy due to challenges obtaining stock. 14% noted they would miss doses occasionally due to the frequency of the high doses prescribed. 3% discontinued for ethical reasons. Patients' comments on "conventional" treatment:

"Having to get our pills under a special authorization is very difficult . We were set up to receive the medication from the hospital and then it was changed to picking up from the pharmacy. There always seems to be issues now. The pharmacy says they can't get a letter from Dr. and Dr. says its been sent. Then the Pharmacy says the medication is stuck at the border. It makes it very difficult and stressful."

"I only get my prescription from a specialist who is several kilometers away from me. This means that I regularly have to make long journeys for my therapy, which is also associated with high costs. There is no doctor near where I live, nobody knows anything about XLH and nobody voluntarily prescribes a prescription for my medication."

"We would have delays at our pharmacy getting our phosphate ordered in or mixed up properly"

"I also had a lot of anxiety giving phosphate to my children due to my kidney disease and my father dying with the same."

Table 4: Side Effects of Existing Therapies

<Table Heading>	<Table Heading>
Diarrhea/IBS	71%
Stomach Pain	64%
Nephrocalcinosis	39%
Calcification (Organs, tissues, etc)	21%
Thyroid Issues	17%

"I was diagnosed with Kidney Disease, with my kidney function dropping to as low as 30%. Doctors strongly believe all of the issues regarding my Kidneys, Thyroid, and Parathyroid are connected to the high doses of sodium phosphate over many years."

"I started on Calcitriol, up to 10 tablets per day, and Phosphate, up to six per day. I stopped taking this medication. As treatment for XLH in children and adults it is extremely hard to tolerate, causing issues with digestion, nausea and constant bathroom visits"

"Calcitriol and phosphate supplements. Struggled to get a high enough daily dose to improve levels and it ended up causing stomach pain, IBS, nephrocalcinosis and thyroid issues."

"Until I turned 21 I took Calcium, Phosphate, and Vitamin D.... I did have to have a parathyroidectomy 5 years ago in which 90% of my glands were removed because of numerous nodules found on them."

"I tried phosphorus and calcitriol, but 1) they didn't alleviate the pain, fatigue, spasms, or progression of enthesopathy or calcification, and 2) they caused extreme abdominal distress (I can handle bone pain and even open heart surgery without pain medications generally, but this abdominal distress wasn't a simply stomach ache; I came close to going to

the emergency room, believing it had to be appendicitis or something similarly dangerous). It also triggered hyperparathyroidism, necessitating an additional medication, Cinacalcet.”

Surgical treatments due to XLH:

Respondents were asked if they have had any surgical treatments for their XLH symptoms. An overwhelming number reported having multiple surgeries and anticipate more in the future. 50 (88%) respondents reported having had major surgeries. Patients commented on over 20 different types of surgeries. We have included here the ones that appear most commonly from respondents. 22 (44%) of respondents have had osteotomies, 8 (16%) have had knee and/or hip replacements, 8 (16%) had 8-plate surgery, 18 (36%) dental surgeries (including, multiple extractions due to abscess, root canals and dental implants) The majority of our respondents are under age 60 (77%)! Many patients commented on having multiple surgeries throughout their lifetime:

“Several double osteotomies throughout childhood and some in adulthood! Over 50 surgeries and 90 percent related to XLH head to toe!”

“2 tibial osteotomies, 1 femur osteotomy, 1 laminectomy, 1 microdiscectomy, 2 inguinal hernia surgeries, 10 oral surgeries for major dental restorative bone grafts, implants, complex extractions”

Treatment of pain

The current standard of care does not address management of pain. Patients were asked how they manage pain associated with XLH. 98% of patients surveyed use some sort of over the counter or prescription pain medication. 52% of respondents reported regular use of anti-inflammatories, 39% reported regular use of Acetaminophen, 21% have to use opioids, 20% use CBD or THC to manage their pain.

5. Improved Outcomes

Patient Preferences: It is important to all patients with XLH that their quality of life be considered when evaluating new therapies. XLH is not only a progressive bone disease, but **conventional treatment using Phosphate and Calcitriol can cause a great deal of harm to the body, such as nephrocalcinosis, kidney disease, calcium deposits, and thyroid issues, all while allowing XLH to continue progressing.** 50% of patients surveyed noted the inconvenience of achieving their daily doses of phosphate, and struggling with side effects such as headaches, stomach pain and diarrhea.

Patients want to stress the importance of receiving treatment with Burosumab. It is injected subcutaneously in bi-weekly or monthly doses, relieving all patients and their families from the struggle of daily dosing with Phosphate and Calcitriol, giving them freedom to go about their daily lives. However, **87% noted the biggest relief for them is the boost in energy levels, muscle function, pain relief, improved bone strength and bone density, fewer broken bones and deformities and overall better quality of life.** Burosumab has also shown evidence of improving kidney function following years of damage from phosphate, along with fewer dental issues. Patients want the ability to choose a treatment option that is safe for them to use but also targets the root causes of their disease, allowing them to have the best quality of life.

“Cost of treatment will be much less than the cost of leaving individuals untreated and relying on their caregivers. The impact to the medical systems, workforce and social services would be tremendous. It is not just the individuals who experience negative outcomes from XLH. I frequently miss work, experience financial instability and daily stress as a result of my partner’s condition. Watching your loved one suffer on a daily basis is horrific. I share their fear of life without funded treatment as we are aware they would become fully dependent on caregiver support for many areas of daily living activities. This fear also extends to the unbearable pain that would be magnified without regular Burosumab treatment. As their caregiver, I would no longer be capable of working which would create additional

financial stressors. Surgeries would not be required as often if adults are treated throughout the lifespan. A PROGRESSIVE disease does not stop impacting individuals when they become adults.”

“At age 42 I had lost my father, the only person that I could speak with about XLH that understood the struggles I faced. I was in severe pain and honestly didn't know if I wanted to continue to live. My mental health was an emotional wreck. My Dad had taught me to be determined growing up with a disease that would not determine who I was. As I remembered his words one day I googled XLH. We had only found out the actual name after my Dad had become paralyzed from his severe spinal stenosis caused by XLH. That day I found a patient advocacy/support group. Through this group I found others with the same disease which I had never met anyone else but most importantly I found out about the clinic trials for Burosumab. I have heard several people in the XLH community call this a miracle drug. It is easy to see the difference it makes in the lives of children. It is so amazing to think those kids will not face the traumatic orthopedic surgeries my generation faced. However, what isn't easy to see are the stories like mine. I am now able to go to the grocery store to buy my groceries, cook meals for my family, and live a life with minimum pain and fatigue. What you can't see is that I am not mentally struggling now to hold on for others when I didn't want to hold on for myself. Burosumab gave me my life back!!! Why should anyone struggle if it isn't necessary?”

“I had my first surgeries 2 years ago and being on Burosumab I was able to heal much quicker than my surgeon had expected based on previous XLH patient surgeries. The reason I had the surgeries was to remove osteophytes on my hips and femurs so that I was able to move as they were beginning to fuse together and prevent me from flexing forward or standing straight. It had been a long arduous process to get doctors to take my mobility seriously (as they said I was so young and I should just exercise more). Finally after 5 years of begging doctors to look at my stature and my walking I was referred to an orthopedic surgeon. I feel that patient care and care teams need to improve in Ontario and the standard of care amongst XLH patients can vary so much and no two are the same so our care teams need to be more prepared for that. Having access to Burosumab has helped me be more active and heal quicker after surgery. I have more energy and less pain on a regular basis and I have not had an abscess or a root canal since being on Burosumab. Previously I have had 14 root canals and over 10 dental abscesses.”

“I have experienced many XLH issues as an adult. However, I have also noticed a huge improvement in my symptoms since starting Burosumab. Mainly, I have less fatigue, less muscle stiffness, less joint pain, and heal from injuries faster.”

“9 months after starting Crysivita I did a 5k foam fest with my family. I tried almost every obstacle. I was able to walk up the hills, although I had to take breaks when we finished, I felt absolutely amazing. It was the start of a new world opening up for me when I realized just how much I could do now.”

“Burosumab has made it possible for me to have a good life. I am able to continue to work full time at a job that is physical. It has to increase my energy levels so I can tackle daily activities. I have had knee replacements on Burosumab and have found that my healing has been successful. When I had surgeries in the past without being on Burosumab my bones took months to heal. Most individuals that have HTO are able to return to work after 12 weeks. When I had the same surgery (HTO) it took my bones 9 months to heal.”

“XLH is NOT just a childhood disease, it is a whole body-whole life disease and should be treated accordingly.”

6. Experience With Drug Under Review

All patients surveyed were aware of Burosumab. Many have children who are treated with Burosumab. 38 adult patients surveyed are currently being treated with Burosumab, 76% of these patients have access to Burosumab through private insurance. The remaining 24% access Burosumab through patient support/compassionate care programs from the drug manufacturer. All report positive results while on this treatment.

“When I was able to start Crysivita my life changed drastically. My pain while not gone has reduced dramatically. I

actually have times when I am pain free. At first when this happened I was afraid to move and walk because I was sure without the pain to tell me when I am about to move wrong I would cause myself permanent damage. I am able to move in ways I have never been able to before Crysvida. I am able to participate in playing with my children taking them to places like Canada's Wonderland, we did a 5k foam fest and I was able to move enough to actually try most of the obstacles."

"I have also noticed a huge improvement in my symptoms since starting Burosumab. Mainly, I have less fatigue, less muscle stiffness, less joint pain, and heal from injuries faster."

"Burosumab has made it possible for me to have a good life. I am able to continue to work full time at a job that is physical. It has to increase my energy levels so I can tackle daily activities. I have had knee replacements on Burosumab and have found that my healing has been successful. When I had surgeries in the past without being on Burosumab my bones took months to heal. Most individuals that have HTO are able to return to work after 12 weeks. When I had the same surgery (HTO) it took my bones 9 months to heal."

Disadvantages: Patients noted the biggest disadvantage is access to Burosumab. Those on treatment, describe the constant worry that they may lose coverage at any given time as annual renewals are challenging. Many patients express the stress that is involved with knowing there is a treatment available that targets the root cause of their disease, but they cannot access this treatment due to cost. Patients comment on their fears:

"I want to stress the insurance issue. We had coverage, we did everything we were supposed to including moving 6 hours from home so my husband could secure work with good benefits. We got coverage and got started. Less than a year later the company changed the benefits so now they still officially covered the Crysvida there was a 5k cap per year. This didn't even cover one dose. When emailing back and forth with HR trying to get this resolved I got copies of emails with the DIN number of the medications me and my daughter were on and instructions from insurance on what my husband's employer should tell us when we complained about the sudden change in coverage with zero notice. Not a single person was even informed that the change took place until after medications started getting denied coverage. This affected a lot of people at his work and they were angry at my husband. We spoke with legal counsel but were told it would settle for 20k if we pursued it and my husband would lose his job. That wouldn't cover a single dose. With the medication being so expensive our insurance has no incentive to follow the law or be decent."

"My biggest fear is that someday my access to Burosumab will be withdrawn, and I will fall back into the world of pain and fatigue that I experienced before beginning the treatment. In fact, it wasn't until I began the Burosumab treatment and it had started to mineralize my bones that I realized just how much pain and fatigue I'd been living with, without fully noticing it at the time, since it was just my normal state of existence. Now that I know what it's like to live with significantly less pain, I don't know how I would handle returning to my old normal. I had a taste of it though when I had surgery and became hypophosphatemic through blood loss, and my entire body hurt. I remembered having felt that way before Burosumab, but at the time, it was just normal, and I didn't know there was any other way to exist. Now I do, and I'm terrified of what it would be like to go back to that level of pain permanently."

"My private insurance requires a new prescription from my physician every year which is not an issue; however they also require that the specialty pharmacy gets prior authorization. This has become increasingly difficult and was denied last year because my current physician at the time was too busy to submit a letter of medical necessity. After going 3 months without medication I was in severe pain again and my fatigue was so severe I was unable to get out of bed for long periods of time. I began to have a mental breakdown. I changed physicians and within a week of seeing the new MD and him writing a letter I was able to get my medication."

Side Effects: Out of the 38 respondents who are currently be treated with Burosumab. 34% indicated having no side effects, 21% indicated having restless legs/limbs at night, 10% had minor injection site rashes, 8% indicated transient joint or muscle pain that passed after 6 months on treatment, 2% indicated, headache, nausea and constipation. 100% of patients have continued treatment regardless of the side effects. Patients comment on side effects:

“Restless leg syndrome from the crysvita. 100 percent worth it though!”

“Improved cognitive clarity, improved muscle function and endurance. I do feel those positive feelings drop off as I approach my next dose though.”

“The only side effect that I experienced was restless legs syndrome. I experienced this for the first six months of taking the medication but after my phosphorus and calcium levels were in normal ranges this side effect subsided.”

7. Companion Diagnostic Test

There are no companion tests to report on for Burosumab

8. Anything Else?

We hope our submission brings to your attention how imperative it is to provide adult patients with X-linked Hypophosphatemia (XLH) access to treatment with Burosumab.

There are many comorbidities involved in XLH, and many are highlighted throughout our survey such as osteomalacia, osteophytes, joint stiffness, arthritis, fatigue, muscle/bone pain, weakness, dental issues, deformities of the lower limbs, fractures, pseudofractures, headaches, spinal stenosis, hearing loss and irregularities of the shape of head. We also highlighted the outcome of patients who have endured treatment with Phosphate and Calcitriol, noting some very serious side effects such as nephrocalcinosis, kidney disease, hypoparathyroidism, thyroid problems and continued progression of the disease.

What’s not always easy to quantify through a survey is the trauma XLH has had on a patient’s mental well-being and quality of life. As you’ve read in our submission, many adult patients are finding themselves on disability, living with limited range of mobility and chronic pain, facing multiple corrective surgeries and suffering greatly from depression and the isolation that comes with having a rare disease. These patients feel left behind by our healthcare system, and lost without a multi-disciplinary standard of care in place. Some patients stated they were told at 18 years of age they were no longer affected by the disease when we know this is a lifelong disease that never stops progressing without proper treatment. Some patients watch their children thrive on Burosumab while they as adults continue to suffer. There is a need for change and that change needs to start with having Burosumab available to ALL patients. This treatment has the ability to stop XLH from progressing and allow a patient to heal and return to being a productive member of their lives and society. We ask that you put the patient’s quality of life first when considering reimbursement of Burosumab, and consider the burden each of these patients have to face if they don’t have access.

Appendix: Patient Group Conflict of Interest Declaration

To maintain the objectivity and credibility of the CADTH reimbursement review process, all participants in the drug review processes must disclose any real, potential, or perceived conflicts of interest. This Patient Group Conflict of Interest Declaration is required for participation. Declarations made do not negate or preclude the use of the patient group input. CADTH may contact your group with further questions, as needed.

Did you receive help from outside your patient group to complete this submission? If yes, please detail the help and who provided it.

No, the submission was completed by members of the Canadian XLH Network.

1. Did you receive help from outside your patient group to collect or analyze data used in this submission? If yes, please detail the help and who provided it.

No, data was collected and analyzed by the members of the Canadian XLH Network.

2. List any companies or organizations that have provided your group with financial payment over the past 2 years AND who may have direct or indirect interest in the drug under review.

Table 1: Financial Disclosures

Check Appropriate Dollar Range With an X. Add additional rows if necessary.

Company	\$0 to 5,000	\$5,001 to 10,000	\$10,001 to 50,000	In Excess of \$50,000
Kyowa Kirin			x	
Ultragenyx		x		

I hereby certify that I have the authority to disclose all relevant information with respect to any matter involving this patient group with a company, organization, or entity that may place this patient group in a real, potential, or perceived conflict of interest situation.

Name: Shari Van Vugt

Position: President

Patient Group: Canadian XLH Network

Date: January 11, 2024

Clinician Input

No clinician group input was received by the deadline of the call for input.