# PEDIATRIC

## Surgical Pain Management Toolkit

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Evidence. Resources. Engagement.

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For additional information, refer to https://michigan-open.org/pediatrics

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# CONTENTS

# TOGETHER WE CAN MAKE A DIFFERENCE

This toolkit focuses on prevention of opioid-related complications in children and adolescents by intervening at the point many are first introduced to them: when acute pain is treated after surgery.[1]

Over the past several decades, despite having good intentions of addressing postoperative pain, providers failed to recognize that opioids have significant risks even when used to treat acute pain and prescribed them as the primary means to control pain in children undergoing surgery. Unfortunately, postoperative opioid prescribing has helped fuel the opioid epidemic, leading to misuse, dependence, and substance use disorder among adolescents — as well as a startling increase in the incidence of overdose in young children.

## An unprecedented increase in overdose deaths

Prescription opioids are a major factor in overdose and death.[2] Between 2015 and 2016, prescription opioid-related overdose deaths increased by 30% among individuals aged 15 to 24 years, the highest of any age group.[3] The age-adjusted rate of opioid overdose deaths continues to rise (a 4% increase from 2018 to 2019, which includes increases among adolescents and young adults).[4,5] There is evidence of persistent use in those newly exposed to opioids after surgery – pharmacy data shows that 5% of adolescents prescribed opioids to manage acute postoperative pain receive another prescription 3-6 months following surgery, far past the time postoperative pain should have resolved.[6]

Although the risks are now clear, opioids continue to be prescribed for management of acute pediatric post-surgical pain in quantities and durations greater than required, without explanation of the risks, alternative strategies for pain management, or options for safe storage and disposal.

Counseling regarding safe opioid storage and disposal is not standardized or consistently delivered. We know the role prescription opioids play in overdose, that overdose rates continue to rise, and that new persistent use following surgery occurs among adolescents at the *same rate* as adults. To overcome the untoward impacts of opioid use during surgical care, we must change the culture of post-surgical opioid prescribing and pain management. **It is not too late**.

## Mitigating the risk is necessary and within our power

The current state of the epidemic is changeable. We can mitigate the risks of opioids by:

- Following evidence-based standards for prescribing pain management medications
- Providing non-opioid based strategies to manage pain
- Creating a culture of opioid safety and consistent messaging by care providers
- Educating pediatric patients and their caregivers about postoperative pain and the risks of opioids
- Encouraging safe storage and disposal of opioid prescriptions

# FOR HEALTHCARE PROFESSIONALS

Nearly half of the opioids prescribed to patients under 21 years old could be classified as high risk, based on pharmacy data from 2019.[7] More than half of these prescriptions were written by dentists and surgeons.

### To begin to combat the opioid epidemic, we need to:

- Review our prescribing patterns
- Consider the amount of opioid being prescribed and consumed
- Rethink patients' pain management

# Best Practices for Pediatric Postoperative Pain Management

We convened a multidisciplinary working group at Michigan Medicine with representatives from Surgery, Anesthesiology, Nursing, Pharmacy, Child Life, and Psychology, who provide care for patients and families after surgery. Together, we discussed concerns about postoperative pain and formulated a common message about how to best manage it. We encourage you to consider doing the same at your institution.

**Michigan Medicine's multidisciplinary working group has developed the following:**

## Throughout the Perioperative Pathway

Provide a consistent message about pain management and medication use, risks, storage, and disposal. Make sure that verbal and written instructions from all providers are consistent, from preoperative evaluation to postoperative follow-up. Coordinate transitions between all clinicians to establish shared expectations for postoperative recovery and pain management needs.

## Preoperative Counseling

As early as possible before surgery, discuss expectations regarding the experience of pain, length of recovery, and functional pain management goals with the patient and family in an age-appropriate manner. Do not routinely provide opioid prescriptions intended for postoperative use prior to surgery.

## Intraoperative Considerations

Discuss with the anesthesia team how to best manage the patient's pain in the operating room so postoperative pain is minimized. Think about using a nerve block, local anesthetic catheter, or epidural when appropriate. Administer intravenous non-opioid medications (e.g., ketorolac, acetaminophen) for management of pain before arrival in the post-anesthesia care unit unless contraindicated.

## Immediate Postoperative Considerations

In the recovery area, use nonpharmacologic techniques such as distraction, Child Life services, and parental presence to address pain and anxiety as soon as it is safe to do so. When appropriate, give enteral non-opioid medications if not already administered pre- or intraoperatively. If opioids are used in the recovery area, oral administration is preferred over IV administration. Consider obtaining a consult from the Pain Service if the patient's pain is poorly relieved despite standard therapy or from the Pediatric Psychiatry Service if a new history of substance use disorder is identified in a patient.

## Postoperative Discharge Considerations

Use non-opioid therapies as a primary method for pain management and include dosing of over-the-counter (OTC) medications and instructions for their use. Discuss and encourage non-pharmacologic therapies, including distraction, heat or ice, and physical therapy.

# First-line Medications for Pain Control

Acetaminophen (Tylenol®) and ibuprofen (Motrin®) can provide similar pain management to opioids. Specifically, a randomized study on pediatric patients undergoing tonsillectomy and adenoidectomy, a procedure associated with significant postoperative pain, showed that ibuprofen and acetaminophen in combination provided similar analgesia to morphine without risk of respiratory depression.[8]

Patient-reported outcome data collection by OPEN also show that for procedures such as circumcision, herniorrhaphy, appendectomy and adenoidectomy, patients have adequate pain management with acetaminophen and ibuprofen alone.[9] Even if opioids are prescribed, using medications such as acetaminophen and ibuprofen can decrease opioid use.


## Prescribe Acetaminophen and Ibuprofen

Since acetaminophen and ibuprofen are available over the counter and don't require a prescription for patients to use, patients and caregivers often do not receive instructions on how to use them after surgery. The packaging instructions for acetaminophen and ibuprofen provide dosing for an age and weight range and recommend as-needed use. If families follow these instructions, they may be under-dosing their children and inadequately addressing their pain. And if they were prescribed an opioid, they may think this is the first medication they should use for their child's pain, not understanding that acetaminophen and ibuprofen often provide adequate pain relief when dosed and administered correctly and that an opioid may not be needed.

## Your Guidance Can Make a Difference

At Michigan Medicine, acetaminophen and ibuprofen are sent electronically as prescriptions to a patient's pharmacy. When acetaminophen and ibuprofen are written as prescriptions and instructions on how to use them are provided, families then have clear information regarding dosing and understand these are the first-line medications for pain management. **Some insurance companies may cover the cost of these medications when they are written as a prescription**.

# How to Dose Acetaminophen and Ibuprofen

**Acetaminophen**
(Tylenol®)
15 mg/kg every 6 hours
(with a maximum of 650 mg per dose)

+

**Ibuprofen**
(Motrin®)
10 mg/kg every 6 hours
(with a maximum of 600 mg per dose)

- **For mild pain**, these are used either individually or together on an as-needed basis.
- **For moderate pain**, they are given on a schedule together every 6 hours during the day, and at night as needed (if the patient wakes) for 1-2 days after surgery, and then as needed.
- **For severe pain**, they are given on a schedule together around the clock for 2 days after surgery and then as needed.

- Avoid ibuprofen and other non-steroidal anti-inflammatory drugs (NSAIDs) in patients with bleeding disorders, renal disease, peptic ulcer disease, and for specific operations at surgeon discretion. Do not use ibuprofen in children under 6 months of age. Use only one NSAID at a time (do not combine NSAIDs).
- Use caution when prescribing acetaminophen in patients with hepatic impairment or active liver disease.

## Give Acetaminophen and Ibuprofen Together

Many families are familiar with using acetaminophen and ibuprofen on an alternating basis as-needed for fever and assume they should use them for pain control in the same way. However, from a pain management standpoint, the half-life of both of these medications is long enough that they can be given together.

**Giving these two different medications at the same time has benefits:**

- Much simpler for families
- Decreases the likelihood of missing or duplicating a dose
- Less disruptive to both sleep and daytime schedules

Simultaneous administration may also allow for longer-lasting pain management.[10] For this reason, we strongly recommend administering acetaminophen and ibuprofen together for pain management. Provide caregivers with information about how to administer these two medications together for pain relief after surgery.

**Use weight-based dosing for acetaminophen and ibuprofen.**

**Recommend several days of around-the-clock use for severe pain.**

**Give acetaminophen and ibuprofen at the same time.**

# Streamline Prescribing and Education by Using Order Sets


At Michigan Medicine, we use the Epic electronic medical record system. When patients are discharged after surgery, providers use a discharge order set that contains instructions on postoperative care. Standard orders for acetaminophen and ibuprofen and instructions on their use have been added to the postoperative order sets. This simplifies the process of prescribing for providers and removes the barrier of additional work.

It also allows for standard weight-based dosing and instructions, and offers the opportunity for families to receive the medication at a pharmacy (where it may be covered by insurance). Providing the medications as a prescription validates these over-the-counter medications as the first-line choice for pain management and ensures patients receive the appropriate dose for their size.

**Create and use order sets to prescribe first-line medications and provide patient education.**

## MICHIGAN MEDICINE ORDER SET EXAMPLE DISCHARGE MEDICATIONS

### ☑ Acetaminophen

- ◯ acetaminophen 160 mg/5 mL suspension - 15 mg/kg Q6H PRN
  Disp-354 mL, R-0
- ◯ acetaminophen 80 mg chewable tablet
  Disp-60 tablet, R-0
- ◯ acetaminophen 325 mg tablet - 15 mg/kg Q6H PRN
  Disp-60 tablet, R-0
- ◯ Contraindicated - no prescription provided

### ☑ Ibuprofen

- ◯ ibuprofen 100 mg/5 mL suspension - 10 mg/kg Q6H PRN
  Disp-360 mL, R-0
- ◯ ibuprofen 200 mg tablet - 10mg/kg Q6H PRN
  Disp-60 tablet, R-0
- ◯ ibuprofen 400 mg tablet
  Disp-60 tablet, R-0
- ◯ ibuprofen 600 mg tablet
  Disp-60 tablet, R-0
- ◯ Contraindicated - no prescription provided

Back to Contents

# Michigan Medicine Patient Education on Order Set

This information is contained in the order set and prints as part of the patient's After Visit Summary discharge paperwork.

## If medication is needed to manage your child's pain after surgery, the best medications to begin with are over-the-counter pain medicines. These are acetaminophen (example: Tylenol®) and ibuprofen (example: Motrin® or Advil®).

- Do NOT give ibuprofen to children under 6 months of age or if your child's doctor has told you not to use it.
- Do NOT give any medications in higher amounts or more often than instructed.

## If your child is prescribed both Tylenol and Motrin, the best way to control their pain is to give the medications TOGETHER every 6 hours.

### To do this, you would:

- Start with a dose of Motrin® and Tylenol® together
- 6 hours later give another dose of Motrin® and Tylenol® together

### Tips for giving medication safely:

- For liquid medications, check the concentration on the bottle to make sure you're giving the correct milligram-based dose.
- Only use an oral syringe or medication cup to dose correctly. If a dosing tool does not come with the medication, ask the pharmacy for one.
- Household spoons are not accurate to measure medications.
- If your child resists taking the medication, use the syringe to squirt small amounts of medicine into the side of their cheek. This prevents gagging and your child is less likely to spit out the medication.
- If your child is resistant to taking pain medication, you may try mixing it with a food or syrup your child enjoys. Some mixes that have worked for other children include mixing medicine with a popsicle to make a slushy or adding chocolate syrup or applesauce.
- Be careful if you are mixing medication with a food your child enjoys in hopes of making it easier for them to take. If you do this, only mix the medication into a small spoonful of food. Otherwise, if they don't finish it, you won't know how much medication they took.

You can also use other non-medication approaches to manage your child's pain. These include spending time with them, playing or doing special projects, eating special foods, watching their favorite shows or movies, and using a cold or warm pack. More information on postoperative pain management can be found at https://michigan-open.org/pediatrics/

# Provider Tool: Opioid Prescribing Recommendations

OPEN conducted a survey of caregivers for pediatric (under 18) postoperative patients at Michigan Medicine from 2020 through 2022. Over 1,000 surveys have been completed for pediatric patients undergoing a variety of surgical procedures through spring 2022. Procedures were selected based on the frequency with which they occurred and/or associated opioid prescriptions.

Eligible patients and their caregivers were called to ask about the quantity and duration of opioid use, use of over-the-counter pain medications, pain score, and overall satisfaction with post-surgical pain management. Patient demographic information, procedure type, and opioid prescription data were gathered from electronic health records and matched with survey information to analyze prescribing patterns, compare pain management, and assess for evidence of overprescribing.

Prescribing recommendations were then developed based on actual use, patient reported outcomes, and expert consensus. **Many of our patient-reported outcome surveys show opioids are prescribed in greater quantities than patients take and stay in the home after surgery, remaining a persistent source for misuse and diversion**.

## Specific Procedure Opioid Prescribing Recommendations

| Procedure | Opioid Doses Recommended |
|---|---|
| **Arm Surgery** | |
| Elbow | 0 |
| Humerus | 0 |
| Radius and Ulna | 0 |
| **Bladder Surgery** | |
| Uteral Implant | 0 |
| **Testicular Surgery** | |
| Hydrocelectomy | 0 |
| Orchiopexy | 0 |
| Orchiectomy | 0 |

| Procedure | Opioid Doses Recommended |
|---|---|
| **Penile Surgery** | |
| Circumcision | 0 |
| Meatoplasty | 0 |
| Penile Release | 0 |
| **Abdominal Surgery** | |
| Appendectomy | 0 |
| Inguinal Hernia | 0 |
| Umbilical Hernia | 0 |
| **Other** | |
| Dental Extraction | 0 |

*Recommendations will be updated as analysis is completed. Data is currently being collected and analyzed for additional pediatric surgical procedures. Visit https://michigan-open.org/prescribing-recommendations/ for the most up to date information.*

# Case Study: Circumcision

## Patient cohort

- 114 pediatric patients
- Pain addressed with acetaminophen and ibuprofen
- 1 patient prescribed an opioid
- 65% survey response rate

## Nearly zero opioids prescribed

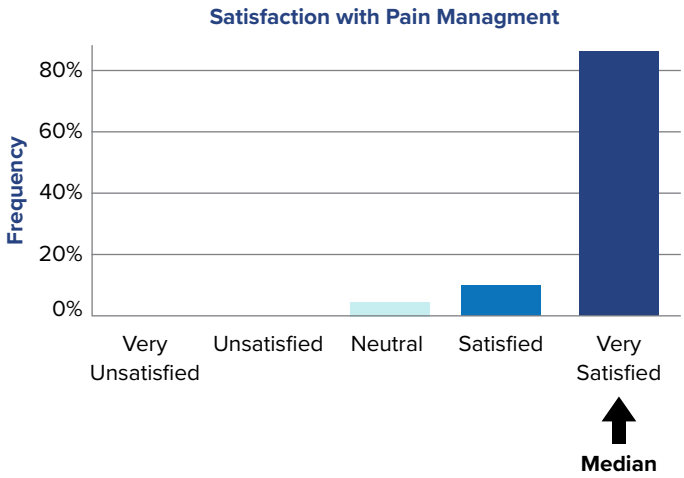
For the 114 patients undergoing circumcision during the quality improvement period, only one patient was prescribed an opioid for pain management.

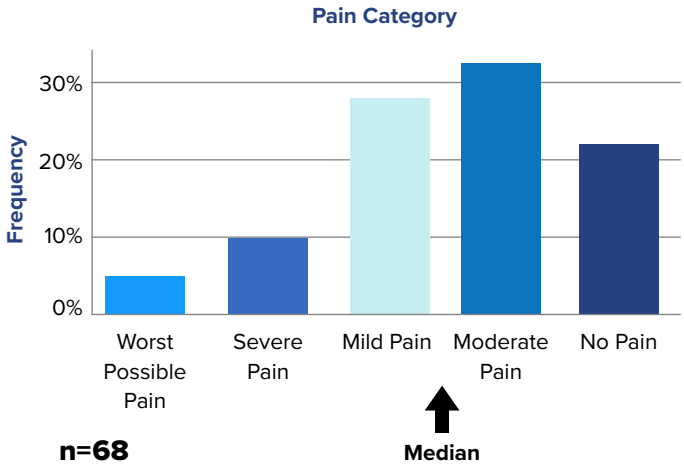
## Pain and pain expectations were managed

Parents reported that pain after surgery was mostly mild to moderate. On the scale of 1 to 5, 1 being no pain and 5 being worst possible pain, the median pain reported was 2.5. Notably, even parents of children experiencing pain did not report dissatisfaction with pain management. Nearly all parents reported their child's pain being about what they expected or better than they expected.

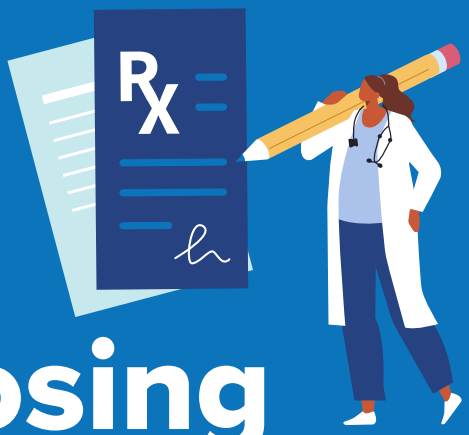
## Parents satisfied with pain management

Nearly all parents of children undergoing circumcision in the project period reported satisfaction with their child's pain management.



# Consider BMI When Using Weight-Based Dosing




In children, opioids are prescribed based on weight (mg/kg) up to a maximum weight of 50 kg. However, most oral opioids have a small volume of distribution and are not well absorbed by fat. If obese children are dosed based on their actual weight, they are at greater risk for complications or side effects compared to children in a lower weight category. In addition, a number of overweight and obese children have comorbid sleep-disordered breathing and are already at higher risk for respiratory complications related to opioid use.[11]

Consider obesity when prescribing opioids and adjust dosing.

## How should opioids be prescribed for overweight and obese children to ensure they do not receive higher doses than are safe?

Optimally, body mass index (BMI) would be considered when dosing opioids. If BMI falls outside of the healthy weight range, providers should not follow strict weight-based dosing and instead consider using ideal body weight, lean body mass or lower dose per kg reference. A recent review performed at Michigan Medicine shows that children with BMI in the overweight and obese categories are receiving more morphine milligram equivalents compared to their peers who fall into a healthy weight category.[12] Further research is necessary to determine how to best calculate opioid dosing in overweight and obese children.

# Patient-Specific Prescribing Considerations

## Screening to Identify Patients at Risk from Opioids

The following best practices were adapted from the Prescription Drug and Opioid Abuse Commission (PDOAC) prescribing recommendations, which were created in partnership with OPEN and the University of Michigan Injury Prevention Center.[13] These strategies have been implemented at Michigan Medicine since 2019.


**Screen** for the patient's opioid-related risk by looking for the following factors:

- **Increased risk of respiratory depression**: Concurrent medication use (e.g., prior opioid prescriptions, sleep aids, benzodiazepines), obstructive sleep apnea, obesity, neurological disorder, oxygen desaturation prior to discharge.
- **Increased risk of opioid misuse**: Concurrent medication use (e.g., prior opioid prescriptions, sleep aids, benzodiazepines), depression, anxiety, chronic pain, past prescription misuse, substance use, or substance use disorder.

**Educate** patients and families about the following:

- Use of prescription opioids ONLY to manage severe breakthrough pain that is not relieved by acetaminophen and ibuprofen
- How to taper opioid use as pain improves
- The side effects of opioid medications (sedation, respiratory depression, dependence, withdrawal)
- The risks of opioid medications, which include addiction, overdose, and diversion (use by anyone other than to whom it was prescribed)
- How to safely store and dispose of opioids
- Appropriate use of naloxone, if prescribed

**Coordinate** postoperative care transitions with primary care providers for patients with elevated risk.

- Refer patients to a specialist for management of substance use disorder or chronic pain, if appropriate.
- Use language that respects individuals with substance use disorder to mitigate stigma.
- If a patient screens positive for increased risk, provide the patient and family education regarding possible adverse outcomes and establish a follow-up plan. The prescription drug monitoring program (PDMP) must be accessed prior to prescribing controlled substances in schedules 2-5 when exceeding a 3-day supply, in compliance with Michigan law. Prescribing limits and "Start Talking" consent may also apply based on patient age and clinical indication.
- Do NOT prescribe codeine or tramadol. Due to pharmacogenetic differences, codeine and tramadol are poor choices for pain management and should not be prescribed.
- Do NOT prescribe fentanyl or long-acting opioids (e.g. methadone, OxyContin®).
- AVOID prescribing opioids that contain acetaminophen (e.g. Norco®, Vicodin®, Percocet®) to minimize risk of acetaminophen overdose.
- AVOID prescribing opioids with other sedative medications (e.g., benzodiazepines, skeletal muscle relaxants).
    - If concurrent prescribing is necessary (e.g., to manage postoperative muscle spasms), educate the patient and family about the increased risks of sedation and respiratory depression and consider co-prescribing naloxone.
    - For additional information about naloxone, refer to https://michigan-open.org/medic/.

# Check Medication Monitoring Programs Before You Prescribe

Prescription drug monitoring programs (PDMPs) are state-level electronic databases that track prescriptions for controlled substances such as opioids.[14] All 50 states and the District of Columbia have implemented PDMPs in an effort to improve risky opioid prescribing practice and keep patients safe and informed.[15]

In Michigan, the PDMP is the Michigan Automated Prescription System (MAPS). Michigan law requires that a query of MAPS be performed when an opioid supply of three days or more is prescribed for a patient. It is good practice to check MAPS prior to prescribing any opioid or controlled substance, regardless of duration.

Use PDMPs before and after prescribing opioids.

## We Can Make PDMPs More Effective

For PDMPs to be most effective, states must work together to improve accessibility, ease of use, and the transparency of PDMPs across state lines. Electronic interstate data sharing will aid in increasing PDMP data's utility, enhancing patient care, and avoiding drug diversion and misuse. This is crucial as evidence suggests that patients cross state lines in order to seek pain management options and avoid detection by PDMPs.[16] In addition, integration of EHR systems, real-time data updates, improved accessibility and ease of use, and access delegation are all critical facilitators that may help improve PDMP implementation and efficacy.[17]

**Integrating PDMP access into the EHR may lead to greater efficiency by:**

- Reducing the time and effort providers need to access patients' prescription histories
- Allowing providers to both interact with patients and obtain pertinent information in one step

Once every quarter, the Michigan Department of Regulation and Licensing sends providers a report of the controlled substances they have prescribed for patients. To assess for ongoing use in patients who have received new opioid prescriptions, consider checking another MAPS report on the patients on your report.

# Preoperative Medication Counseling

As prescribers write for fewer opioids, there may be concern about possible increase in phone calls for refills or inadequate pain management. In fact, single institution studies found that with appropriate patient education, not only did patients consume less medication, but requests for refills did not increase.[18] To ensure appropriate pain management, all patients and families should receive preoperative counseling about postoperative pain and how to manage it.

## Set Clear Expectations

Talk about the experience of pain and usual length of recovery with the patient and family in a manner that is age appropriate.

- *"Some pain is normal. Your child should be able to walk and do light activity, but may be sore for a few days. This will gradually get better with time."*
- *"Half of all patients who have this procedure take less than five doses of an opioid medication."*

## Discuss Effective Alternatives

Discuss use of over-the-counter medications.

*"Tylenol® and Motrin® are the first medications we use to manage your child's pain after surgery. By themselves, they are often enough to manage your child's pain."*

## Explain Safer Use

Explain when opioids should be used.

*"These pills are only for management of severe pain from your child's surgery and should not be used to manage pain from other conditions."*

## Talk About Risks

Talk about the possible risks associated with opioids.

*"We are careful about opioids because they have been shown to be addictive, cause harm, and even cause overdose if used incorrectly or abused."*

## Advocate for Disposal

Let patients know that they should dispose of their medications after acute post-surgical pain has resolved, and how they should do this.

*"Disposing of the opioid prevents accidental overdose or misuse. You can use a drug disposal bag, take pills to an approved collector (including police stations), or mix the medication with kitty litter in a bag and throw it in the trash."*

# Michigan Medicine Pharmacy Counseling Example

To help educate families about safe use, storage, and disposal of their opioid medications, pharmacy counseling for opioids was implemented at Michigan Medicine. When families pick up their opioid prescription here, they receive counseling on safe use, storage, and disposal as well as a Deterra® drug disposal bag. The bag allows families to dispose of their opioid medication safely at home after acute postoperative pain has resolved.

C.S. MOTT CHILDREN'S HOSPITAL
UNIVERSITY OF MICHIGAN HEALTH

*The prescription received today is an opioid. Please review this sheet to ensure the opioid is given & stored safely.*

**Give safely**

| | Notes |
|---|---|
| **Medication overview** | Medicine name/brand_____<br>Dose_____<br>Circle pain type: Mild / Moderate / Severe |
| **Medication Tracking** | Use this format for tracking the doses of medicine your child receives and when he/she receives them:<br>Medicine name \| Last dose \| Time of last dose \| Dose \| Time |
| **Side effect review** | ☐Drowsiness<br>☐Upset stomach<br>☐Constipation<br>☐Other_____<br>Refer to the info sheet provided by the pharmacist to learn more about the side effects of your medication. |

**Keep safely**

List some places in your home where medicine can be safely stored out of a child's reach.

**Toss safely**

Scan the QR code to find drug disposal information and resources near you, or visit:
michigan-open.org/takebackmap

**I will use these steps to safely administer medication prescribed to** _____ (Name of child)

**I will safely store this medication in** _____ (Location in home)

**I will throw away unused medication when it is no longer needed, using the following safe disposal method:** _____ (Method)

Download Example

Back to Contents

# Connect with Primary Care Providers for Better Outcomes

While a prescription from a surgeon may be the initial point of opioid exposure for a patient, the relationship a surgeon has with a patient is often episodic and as a result, signs of ongoing use or misuse may not be identified. A primary care provider has a longitudinal relationship with the patient and can be better equipped to identify persistent use, misuse, or onset of substance use disorder. However, primary care providers are often unaware that their patients have received an initial opioid prescription from their surgeon. Providing a primary care provider with information about their patient's operative procedure and the plan for management of acute postoperative pain (especially if that plan includes an opioid prescription) allows for better communication, consistent messaging, and improved patient monitoring after surgery.

The goal of this communication is to let the primary care provider know that their patient had surgery, when it occurred, the plan for pain management, whether an opioid was prescribed and, if so, how much was dispensed, and the expectations in terms of pain duration and plan for refills (if any).

Ideas in terms of sharing this information include using the capability of the electronic medical record to auto-populate a letter or communication to the primary care provider containing this information. If an after-visit summary is created by your electronic medical record, you might forward a copy of this automatically to the primary care provider. Providers could also add standard language to their operative notes containing this information and forward the operating report to the primary care provider.

Dear PCP,

Today, your patient (insert patient name) underwent (insert surgery name).

Postoperative medications include:

(list all new medications prescribed today)

If the patient was prescribed an opioid, we intend this for short-term use to manage severe breakthrough pain only. We expect the nature of their pain to be time-limited and no further opioid medication to be prescribed. If you have concerns, please contact us.

Sincerely,
Surgeon

Back to Contents

# For Families

Surgery can be stressful for both you and your child. This is natural and expected, and some of this comes from worry about the pain after surgery and how it can be managed. These tools will help you talk to your surgeon about pain before your child's surgery and manage your child's acute pain following their operation.

**Disclaimer**: This information is not meant to be applied in cases of chronic pain in children.

# Preparing for Your Child's Surgery

Pain tells your child that their body is healing and that they might need to balance activity with rest. It is an uncomfortable but natural part of recovery. The amount of pain, how long it lasts, and when it peaks varies based on the procedure that the child undergoes. Each child can have a different emotional response to pain as well, which changes their pain experience.

## Helping Your Child Recover Well

Every child recovers from surgery in their own way, and kids who have the same procedure might have completely different experiences of pain. In most cases, the pain will not be long-lasting and will get better with time and healing. This is called *acute pain*. The goal with acute pain is to manage it in a safe way, so children can heal and recover well. They should be able to drink, eat, and sleep as best as possible given their post-surgical condition.

Pain can be managed using both medication and non-medication options as part of a larger pain management plan to be discussed with your surgeon.

## Boost Your Post-op IQ: Questions to Ask Your Surgeon

Below are some questions to consider when meeting with your child's surgeon. Getting answers to these questions can help you navigate your child's recovery with more confidence.

- What level of pain is typical after this surgery?
- When should I expect the pain to improve?
- When should I be concerned if the pain doesn't improve?
- What can I do to help the pain improve? Will over-the-counter medications such as Tylenol® (acetaminophen) and Motrin® or Advil® (ibuprofen) be recommended, and will you provide dosing instructions for them? Should I use them only if needed or on a schedule? Should I get them before surgery?
- Do you recommend prescription medication such as an opioid for my child? How much will you prescribe and at what dose? What are the risks of using an opioid?
- If I choose not to fill an opioid prescription for my child, will you honor that decision?
- If I don't get an opioid prescription after surgery but then need it during recovery, how difficult is it to get later?
- Does the hospital have Child Life services who can offer preoperative experiences including tours and websites explaining the surgery process?

The answers to these questions will vary based on the surgery your child is having. If your surgeon is using medical language that you don't understand, ask them to rephrase it using common language.

## Discuss with Your Surgeon:

- If your child has risk factors for opioid addiction, including depression, anxiety, current medication use, prior opioid misuse, or a family history of addiction
- If your child has increased anxiety about their surgery
- Any other concerns you may have about your child having surgery

After your visit, reach out to your surgeon's office if you have any additional questions.

# Talking About Surgery with Your Child

Preparing your child for surgery is important to help their surgical experience and recovery go more smoothly.

## Prepare Together

Have age-appropriate conversations with your child about their planned surgery and what to expect.

- Let your child guide the conversation.
- Answer their questions as best as you can, using simple language they can understand.
- Check what resources your surgeon or hospital may have to help you prepare your child.
- Read stories of similar experiences:
  - *Thump! Ouch!* is a book about a child who gets hurt and needs to go to the hospital.
- Watch videos as examples:
  - Preparing for Surgery at Mott Children's Hospital

Consider your child's anxiety level when talking to them about surgery.

**Choose the right time**. If your child is anxious, it may be better to wait until a few days before surgery to discuss it with them, as their anxiety may grow as they wait. It is still very important to talk with them about surgery before the event, so they can be prepared.

**Encourage feelings of security**. Remind your child of the things that will stay the same despite the changes that happen with surgery and recovery. Some of these stable things include family, home, their room, pets, and their school.

Help your child keep an attitude that is adaptive, flexible, and hopeful.

**Don't be afraid to talk about pain**.

- Help your child understand that you and the medical team will work to manage their pain as best and safely as possible.
- Be honest and positive. This will help your child have realistic expectations about their pain following surgery.
- Review the reasons for your child's surgery, and remind them that the surgical pain will be temporary.


Marcus loves playing with his friends Olivia and Nora, but one day while they are swinging at the playground he falls and gets hurt. He has to go to the hospital! At the hospital, Marcus meets a dog named Denver who teaches him about pain, how to help the pain feel better, and how to take medicine safely so that Marcus can get back to playing with his friends again.

The book can be read with augmented reality using your smartphone or tablet. The book is available in English or Spanish. Contact Mott-Pediatric-Trauma@med.umich.edu

https://pediatric-trauma.med.umich.edu/injury-prevention/pain-and-medication-resources

# Preparing for Your Child's Surgery

Think about how your child reacts to pain and what has helped them deal with pain most effectively in the past. For a young child it can be difficult to understand why they are experiencing pain; physical comfort, such as hugs and snuggles, can be very helpful.

## Preparing for Your Child's Surgery

Be sure to consider your own concerns about your child's upcoming surgery and possible pain. Work to manage these, so you can be a calm, healing presence for your child. This will help them recover and manage their pain. Remember, the goal of pain management is to regulate enough of the pain, so that your child can heal and recover. They should be able to drink, eat, and sleep as best as possible given their post-surgical condition.

Purchase the over-the-counter medications (Tylenol®, Motrin® , Advil®) that your care team has recommended to use at home.

Buy food and drink that your care team recommends.

Gather things such as toys, music, books, and technology to be used for distraction after surgery.

Your child may be at home and away from school or daycare for a period of time following surgery, and may require your full-time care while they recover. If your child will miss school, communicate with their teacher before surgery to come up with a plan for their missed homework. If your child is anxious, this will also help reassure them that they won't fall behind in their work.

**Downloadable Resource: Planning For Surgery and Pain Management Worksheet**

Making a plan before surgery about how you might address pain can help with recovery and pain control. You should consider both medications as well as non-medication options that have worked well in the past.

# Preparing for Your Child's Surgery *continued*

## What You Should Know About Your Child's Surgery

After surgery, you might be invited to join your child in the recovery area. This will depend on your hospital's policy. Know that some children are very upset when they first awaken. This can be a consequence of the anesthesia itself rather than pain. Your child's recovery team is best equipped to manage this and can answer any questions you may have.

## Create Comfort at Home

Your goal is to support your child and help them be as comfortable as possible.

How will you know if your child is in pain? Ask them and watch them. You know your child best and can pick up on any signs that they're in distress.

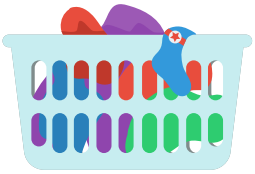
Pain might affect their sleep, appetite, and mood. They might wake up more often at night, not want to eat or drink, cling to you, or withdraw from you. For young children, it can be difficult to understand why they are having pain. Encourage and support them. Each child is unique, and their recovery may be different from another child's. Use what you know about your child to help them recover.

## Get Support if You Can

Understand that if your child isn't sleeping well, you probably will not be sleeping well either and may need support. Do not be afraid to ask for or accept help from others. Make a list of things that you could use help with, including:

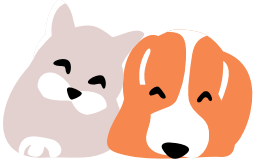
Groceries

Pickups and care for other children



Laundry

Housecleaning



Petcare

Take good care of yourself, so that you are able to care for your child. Remember: pain is a typical response to surgery, and if your child has pain, this is the body's natural way of recovering. It is not a sign that you are failing them as a parent. If there are other members of your household who rely on you for care, try to create a plan that allows you time to focus on your child's needs after surgery.

# Managing Pain After Surgery

## Over-the-Counter Medications

Your child's surgeon may recommend using over-the-counter medications (available without a prescription) such as Tylenol® (acetaminophen) and Motrin® or Advil® (ibuprofen.

Tylenol® and Motrin® each work in different ways to manage pain. They can be given together.

### Give the dose your doctor recommends

It is important to use the dose your surgeon recommends **even if it is different from the dose listed on the medication bottle**. The dose on the bottle is based on age, but dosing based on your child's weight may manage pain better.

Your team may recommend using these medications on a regular basis ("around the clock") to manage pain. This means giving your child the medications on a set schedule during the day and even at night. Ask your surgeon what dosing schedule to follow, as well as how to give the medications.

Ask the surgeon what dosing schedule to follow and how best to give your child the medications.

### Let your care team guide you

While these medications are usually alternated for management of fever, for pain they can be given together. If you give both Tylenol® and Motrin® together (at the same time), this decreases how often you need to give the medication and can be simpler. If you're giving the medication around-the-clock, it also means less frequent waking up at night. Follow the instructions your care team gives you in terms of how to use these medications and for how long.

## SAMPLE SCHEDULES PAIN MANAGEMENT MEDICATIONS

| Scheduled every 6 hours "around the clock" | | Scheduled every 6 hours while awake | |
|---|---|---|---|
| 8 AM | Acetaminophen and Ibuprofen | 8 AM | Acetaminophen and Ibuprofen |
| 2 PM | Acetaminophen and Ibuprofen | 2 PM | Acetaminophen and Ibuprofen |
| 8 PM | Acetaminophen and Ibuprofen | 8 PM | Acetaminophen and Ibuprofen |
| 2 AM | Acetaminophen and Ibuprofen | | |

# Managing Pain After Surgery *continued*

### Keeping track of your child's medications is important

This will allow you to manage the pain safely without using more medication than is advised. As with any medications, there are possible serious side effects if used more frequently or at higher doses than prescribed.

You can keep track of medications by making notes on a medication log or on your phone. Write down the name of the medication, the time you gave it, the amount you gave, and when your child can have the next dose. Share this information with anyone else who is also caring for your child, so a dose isn't accidentally given twice.

**Note**: Other medications may also contain acetaminophen. Check the labels on any medications you're giving your child (such as a prescription opioid medication) or other over-the-counter medications to make sure they aren't already receiving acetaminophen.

## TIPS FOR GIVING MEDICATIONS SAFELY

### CHECK

For liquid medications, check the concentration on the bottle to make sure you're giving the correct milligram-based dose.

### MEASURE

Only use an oral syringe or medication cup to dose correctly. You can buy these at your pharmacy if they do not come with your medication.

- Household spoons are **not** accurate to measure medications.

### ADAPT

If your child resists taking the medication, use the syringe to squirt small amounts of medicine into the side of their cheek. This prevents gagging and your child is less likely to spit out the medication.

- Be careful if you are mixing medication with a food your child enjoys in hopes of making it easier for them to take. If you do this, only mix the medication into a small spoonful of food. Otherwise, if they don't finish it, you won't know how much medication they took.

### COMFORT

Have a positive attitude. Be calm, honest, and empathetic but remain in charge. Explain why the medication is helpful.

### PRAISE

Give your child praise when they take the medication. Some children respond well to a small reward such as a sticker or a chart that leads to rewards.

### CONSIDER

Ask your pharmacist if you can refrigerate the medication, as the cold temperature may make it easier for your child to take.

- Sucking on ice chips or a popsicle first will also dull the taste of the medication. You can also follow the medication with a cold drink of something they enjoy.
- Motrin® can cause stomach upset if taken without food. If possible, give with food or milk.

# Non-Medication Pain Management

Non-medication strategies play an important role in managing pain and reducing anxiety. You can use these strategies, along with the medications your surgeon has recommended, to help your child recover. Using these methods may allow you to decrease use of opioids and avoid their side effects.

## Some Examples of Non-medication Pain Management Options Are:

### Mindfulness

Practicing calm breathing, like belly breathing or square breathing, can help to relax muscles that are tensed because of pain or anxiety. Your child can use their imagination to visualize a place that makes them feel calm, relaxed, and comfortable.

### Special Foods

Special foods, such as ice cream or popsicles, can distract your child from their pain by giving them something enjoyable to think about.

### Art

Art can be a tool for positive coping, a distraction from pain, and an outlet for your child or teen to communicate their feelings.

### Music

Music may be very comforting when your child is experiencing pain or discomfort. Listening to music, singing, or writing songs can help lessen pain and anxiety.

### Games & Play

Keeping your child's mind focused on something else can help reduce their awareness of pain. Helpful distractions can include toys, board games, video games, or movies.

### Books

Reading children's books about surgery and emotions can help your child understand their own pain and feelings better. This may give them a sense of control and decrease their anxiety. Reading your child's favorite books and stories together can also comfort them.

### Family Time

Many children are reassured by the presence of their family. Spend time with your child and be a calming presence for them. Some children are relaxed by gentle touch and massage, which can help reduce pain.

### Sleep

Sleep helps the body heal. Allow your child to get the best night's sleep possible by getting them to bed at their usual time and providing a relaxing and calm environment

### Food & Hydration

Make sure your child is drinking enough fluids and eating as normally as possible while being mindful of any restrictions from your surgeon. Dehydration can worsen recovery and increase pain. Some signs of dehydration in children are:

- Dry lips, mouth, or skin
- Decreased urination
- Lack of tears when crying
- Lethargy (decreased energy)

# A Quick Guide to Opioid Medications

## Medications are only one part of your child's pain management plan.

Opioids are strong prescription pain medications with the potential for serious side effects and complications. Common opioid names include oxycodone, hydrocodone, morphine, and codeine. *It is important to know that codeine is not recommended for use in children.*

### Try Tylenol and Motrin first

Because of their risks, opioids are not usually the starting point to manage acute pain. Over-the-counter medications and non-medication techniques should be the first things used to manage acute pain. Together, they are often enough to manage your child's pain. If an opioid is prescribed, it is usually only for management of *breakthrough pain* after surgery.

Breakthrough pain is severe pain despite over-the-counter medications and non-medication techniques. Know that even if you are using an opioid for breakthrough pain, you should still use the over-the-counter medications recommended and non-medication techniques. This will allow you to use as little of the opioid as possible.

Some opioids already contain acetaminophen. If this is the case, your child may be unable to take over-the-counter acetaminophen with the opioid. **Check the label and discuss this with your pharmacist**.

### Opioid side effects

Anyone who uses an opioid is at risk for these side effects:

**Nausea and vomiting**

**Constipation**

**Itching**

**Sleepiness**

**Slowed breathing**

**Impaired motor skills, thinking, or judgment**

Children who are overweight or have obstructive sleep apnea or snoring have a higher risk of sleepiness or slowed breathing from an opioid. *Do not use opioids to help your child sleep.*

## COMMON OPIOIDS INCLUDE:

| Generic Name | Brand Name |
|---|---|
| Fentanyl | Duragesic* |
| Hydrocodone | Vicodin®*, Norco®* |
| Hydromorphone | Dilaudid® |
| Methadone | Methadose® |
| Morphine | MS Contin®, Kadian |
| Oxycodone | Perococet®*, OxyContin® |
| Oxymorphone | Opana® |
| Tramadol | Ultram®, Ultracet®* |

* Contains acetaminophen (Tylenol). Use caution if you're also taking acetaminophen separately.

Back to Contents

# Opioids Have Real Risks

Anyone who uses an opioid, even for a short time, is at risk for dependence, tolerance, misuse, addiction, and overdose. Adolescents are especially at risk for opioid misuse and addiction because the parts of the brain that control impulsiveness and decision-making are still developing.[19] In addition, peer pressure can also affect their behavior. Other factors that increase the risk of opioid use disorder include personal history of depression and/or anxiety and family history of substance use disorder.

## Tolerance

When an opioid no longer has the same effect on your child's pain as it first did, which means they need a higher dose to control pain. For example, if your child is taking an opioid which first worked well for pain, and then later it doesn't work as well, it does not always mean the pain is worse. Instead, your child may have become **tolerant** to the opioid.

## Dependence

When your child's body has started to rely on the opioid to function. This can happen even with using an opioid for a short time period, but the longer your child takes an opioid, the higher the risk. This is one reason why it is important to use an opioid for as short a time as possible. Suddenly stopping an opioid when a person is dependent causes symptoms of withdrawal, such as muscle aches, yawning, runny nose and tearing eyes, sweating, anxiety, difficulty sleeping, nausea/vomiting, and/or diarrhea.

## Misuse

When your child takes the opioid they were prescribed at a higher dose, more often, or for reasons other than which it was prescribed.

## Addiction

When your child develops a brain disease known as Opioid Use Disorder (OUD). People with this condition seek and use opioids even though they are causing them harm.

## Overdose

When your child takes a dose of medication that is too high for them. This affects breathing and can cause your child to stop breathing.

## Diversion

When anyone other than your child gets and uses the prescribed medication. This can happen when you do not safely dispose of an opioid or leave it unattended. Diversion is dangerous because it can lead to misuse, overdose and/or opioid use disorder in others. Sharing or selling an opioid is a felony in the state of Michigan.

# Tips for Reducing Opioid Risk

- Tell your doctor about any other medications your child is taking and if your child has a history of opioid misuse or addiction, depression or anxiety, or a family history of addiction.
- Do not use opioids along with antihistamines such as Benadryl or sleep medications.
- Only use the opioid for the reason, dose, and frequency that it was prescribed, and use it for the shortest possible time period. If your child doesn't need it, don't use it and dispose of it properly.
- Write down what medications you're giving your child and when. This will help you be sure you're using the medication only as prescribed.
- Double-check dosing to make sure you're giving only the amount prescribed.
- Watch your child for signs of side effects or complications, and if you notice them, contact your provider.
- Lock the opioid medication in a safe place. If you cannot lock it up, keep it out of common areas of the house.
- Do not share your child's opioid with anyone else. It is a prescription only for your child.
- Dispose of any remaining medication in a safe way when your child has recovered. Keeping an opioid prescription in your home is risky. Children may accidentally take it and overdose, and others may find it and misuse it. Ask your pharmacy if they have home drug deactivation/disposal kits to give you so you can safely dispose of your medication.

# Medication Safety: Remove the Risk & Be Part of the Solution

Stopping the opioid epidemic starts with removing risk from our homes. Keeping opioid medication in your home is risky. Younger children may accidentally take it and overdose, while adolescents and adults may find it and misuse it. Safe storage and disposal of opioids and unused medications protects both your family and your community. The Food and Drug Administration (FDA) recommends drug take-back options or mail-back programs as the first-line approach.

Every 10 minutes a child visits the emergency room for medication poisoning.[20]

Three in five teens say prescription pain medication is easy to get from their parents' medicine cabinet.[21]

12.5 million people age 12 and older misused opioids in the last year[22]

https://pediatric-trauma.med.umich.edu/injury-prevention/medication-safety


## Store opioids safely

It is important to store opioids out of sight and reach of children, teens, and pets. Safe storage prevents accidental opioid use or misuse.

- Store opioids in areas only you have access to.
- Lock up your pills if possible (like a drawer or box).
- Do not store your opioids in common rooms in the house or in purses.

Download Brochure

# Dispose of Opioids Safely

## Personal disposal method

- Deactivating pouch
  - Example: Deterra®[23]
  - Scan QR code for instructions on how to use Deterra®.
  - English and Spanish versions provided.
- Mail back pouch
  - Example: Stericycle®[24]

## Permanent disposal box

- Find a disposal box near you on a Household Drug Take Back Map
- These collection sites safely and securely gather and dispose of your unused or expired medicines, including those that contain controlled substances.[25]
- In your community, authorized collection sites may be retail, hospital, or clinic pharmacies and/or law enforcement facilities.

## Take Back Event

- Find a medication Take Back Event in your community.
- Events are hosted through partnerships with law enforcement and community health organizations.
- They are typically hosted in the spring and the fall.
- For more information, scan the QR code to visit our Take Back Event website.

## Personal Trash

Use your household trash as a last resort.

- Mix opioids (do not crush) with used coffee grounds or kitty litter in a plastic bag and throw in household trash.
- Scratch out personal information on prescription labels and dispose of original medicine containers.

Do **not** flush opioids down the toilet.

- This can cause environmental problems.
- Flushed medications contaminate the surface and groundwater.[26]

# DOWNLOADABLE RESOURCES





### Customize

Co-branding our materials with your organization's logo is available upon request and free of charge.

## Medication Tracking Log

This log will help you keep track of which medication you've given your child, including the time they've received it and the dose.

Download the log

## Non-Pharmacological Pain Management Brochure

Learn how to manage or reduce your child's pain and anxiety without using medication.

- Distraction techniques
- Mindful breathing
- Memory bank exercise

Download the OPEN brochure: English, Spanish, Arabic

## Safe Storage & Disposal of Opioids Stock Card

Learn how to safely store and dispose of your opioids.

Download our stock card: English, Spanish, Arabic

## Pain Plan Tool

Making a plan before surgery about how you might address pain can help with recovery and pain management. You should consider both medications as well as non-medication options that have worked well in the past.

Download the tool

## Brochures

We offer to customize the brochures seen throughout this guide with your organization's logo free of charge. OPEN's brochures include all of the legislatively mandated education required when prescribing an opioid.

Visit our website to view and request your free customized brochures.

# LEARN MORE

### Helpful Resources

- How opioids specifically affect teenagers: National Institute on Drug Abuse
- About opioids and their risks: Centers for Disease Control and Prevention
- How to talk to your child about surgery: Children's Hospital at Dartmouth-Hitchcock
- Three- to five-minute videos from the Pediatric Trauma Group at C.S. Mott Children's Hospital on medication safety and non-medication options for pain management in five- to eight-year-olds and eight- to 12-year-olds.
- A website created by the Pediatric Trauma Group at C.S. Mott Children's Hospital focused on medication safety.

### Additional Information

- National Institute on Drug Abuse (NIDA)
- Centers for Disease Control and Prevention (CDC)
- Children's Safety Network
- US Food and Drug Administration (FDA)
- Substance Abuse and Mental Health Services Administration (SAMHSA)
- National Institutes of Health (NIH)
- US Drug Enforcement Administration (DEA)

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# ACKOWLEDGMENTS

## AUTHORS AND CONTRIBUTORS

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### OPEN

At OPEN (Opioid Prescribing Engagement Network), we work with physicians, public health experts, policymakers, and payers to positively impact the opioid epidemic through improved prescribing and pain management. OPEN aims to prevent opioid-related harms throughout the state and beyond through data-driven research, evidence-based pain management recommendations, development of education and resources for patients and providers, and community engagement. Visit michigan-open.org for the most up to date recommendations, educational materials, and resources.

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### University of Michigan Health C.S. Mott Children's Hospital

The University of Michigan Health C.S. Mott Children's Hospital, a Level 1 Pediatric Trauma Center, cares for the most seriously injured children. Our work involves educating children and adults, advocating for effective laws, providing reduced cost safety products to low-income families, conducting research, and creating safe environments. In addition, we provide a wide range of educational injury prevention programs and outreach events for children, parents, and community members, such as car seat installation tutorials and infant safety classes.

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