



Enhancing Intravenous Cannulation experience, with the Use of Anesthetic Gel EMLA, for both Patients' and Staff's in a Primary Health Care Setting

Authors

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Project Nature: Quality Improvement Project

Part I — Project Charter

Background and Problem Description

Among the routine procedures, probably the most common one in both outpatient and hospital are the intravenous (IV) catheter insertions. Even though it is a standard operation, a large number of patients go through significant pain, discomfort, anxiety, and procedural fear. These negative views can impact not only patient compliance and overall satisfaction but also their trust in the healthcare service.

Topical anesthetics, especially the EMLA, are very effective in lowering the pain that is felt during minor interventions as drawing blood, performing small skin operations, and putting a needle into an intravenous line. Though there is strong evidence to support this claim, topical anesthesia is still infrequently used in some areas of the clinic. Among the reasons for this are: limited time resources, a lack of standardized protocols, untrained personnel, and a long-standing belief that the pain of cannulation is either very small or unavoidable.

The main aim of this Quality Improvement (QI) project is to find out if the routine use of topical anesthesia prior to IV cannulation will lead to a decrease in patient-reported pain and an increase in staff experience in the course of treatments performed in the Health Center's treatment rooms.

Quality Dimensions Addressed

- Worklife Quality
- Client-Centered Services Strategic Priorities Supported
- Strong Partnerships with Patients, Families, and Community
- Enhanced Primary Care System and Quality
- Effective and Innovative Organization
- New Idea / Innovation

Project Team

Project Leader: Dr. Teeba Salwan Kamal Abbood

Authors Members:

Dr. Teeba Salwan Abbood (Corresponding Author)

Dr. Khalid Alkarbi

Dr. Hamda Al Mansoori
 Dr. Hamzeh Yousef Khmour
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Stakeholders

Nursing staff

Adult patients receiving IV cannulation

Patient Engagement:

The following activities can help get patients involved:

- Feedback gathered through structured form for pain scale and staff questions reflecting satisfaction

Aim Statement:

The goal is to lessen the pain and anxiety that patients report to at least 10% from the original level during the period from February 1 to April 30, 2025, through IV cannulation in treatment rooms using EMLA cream

Evidence Review:

A brief overview of the main proof that backs the application of topical anesthesia:

1. Kumar et al., 2015 – “Topical Anesthesia”

Significant pain reduction in various clinical areas (venipuncture, dermatologic procedures, and minor surgeries) was shown. The progress in formulations has continuously been supporting the position of topical anesthesia as an effective alternative to local infiltration.

2. Valdovinos et al., 2009 – “The Use of Topical Anesthesia During IV Catheter Insertion in Adults”

A randomized study comparing LMX-4 and placebo:

Mean pain score with LMX-4: 3.2

Mean pain score with placebo: 4.67

Statistically significant ($p = 0.003$)

The result supports the routine use of topical anesthesia before venipuncture.

3. Harrison et al., 1992 – “Appropriate Use of Local Anaesthetic for Venous Cannulation”

The study suggested that pain caused by intravenous cannulation of gauges 18-22 was significantly higher than subcutaneous infiltration with lignocaine ($p <$

0.006) thus disputing the common opinion that pain from anesthesia exceeded that of cannulation.

The authors strongly recommended the use of topical or injectable anesthesia in routine practice.

Project Scope

Included:

- IV cannulation executed in therapy rooms (for both genders)
- Patients over age 18 only

Excluded:

- Urgent, where delays are unacceptable
- Pediatric and laboratory cases (might be included in future phases)

Measures:

- Outcome Measures
- Patient pain score (mild-moderate-severe)
- Staff satisfaction and perceived ease of cannulation

Process Measures

- Rate of EMLA application prior to IV cannulation
- Completeness of documentation
- Data Collection Methods
- Patient and staff surveys
- Direct observation
- Weekly documentation and compliance audits

Project Target

A $\geq 10\%$ improvement in mean pain score and satisfaction levels.

Root Cause Analysis (Summary of Fishbone Analysis)

People

Unawareness of the advantages of topical anesthesia

Wrong impression that anesthesia is not needed

Undertraining of the staff as regards pain management

Process:

Lack of a protocol that dictates the use of topical anesthesia

Time pressured and large patient volume
 Unpredictable workflow in the treatment rooms
 Policies
 No institutional mandate or quality requirement for compliance
 No accountability mechanism that would facilitate the use
 Physical Structure
 Treatment room space is limited
 EMLA supplies are not consistently available
 Change Ideas Considered
 Making EMLA application prior to IV cannulation a standard procedure
 Training staff on different methods of pain relief
 Making use of posters, visual aids, and Cerner alerts
 Giving treatment room staff the authority to make EMLA requests
 Future plans for pediatrics and laboratory services expansion
 Selected Change for Testing
 Routine application of topical anesthesia (EMLA) to improve patient comfort and enhance staff experience during IV cannulation.

Part II — PDSA Cycle

Purpose

To evaluate the impact of applying EMLA prior to IV cannulation on patient pain scores and staff experience.

PLAN

Objective

To determine whether EMLA use leads to:

- $\geq 10\%$ reduction in pain scores
- Improved patient satisfaction
- Enhanced staff experience
- Target population: 84 adult patients

Predictions

70–80% of patients will report reduced pain
 Staff will report smoother procedures and improved cooperation
 Patient-centered care will be enhanced
 Minimal delays in workflow
 Measurement Plan

Post-procedure VAS pain scores
 Patient comparison to previous cannulation experiences
 Staff satisfaction surveys
 Monitoring of adverse reactions
 DO (Implementation)
 EMLA applied before cannulation following inclusion criteria
 Standardized timing and documentation used
 Patients asked to report post-cannulation pain score and compare to prior experiences
 Staff completed periodic satisfaction assessments
 One mild adverse skin reaction occurred and resolved without intervention

Study (Results and Interpretation)

Results:

75% (63 out of 84) of the patients said that EMLA had lessened their pain
 Significant gains in both patient comfort and staff workflow were reported
 Very few side effects (1 out of 84), safety was thereby confirmed
 The staff observed that patient anxiety was lower, cooperation better, and cannulation easier

Interpretation

The application of topical anesthesia resulted in quite large patient-reported pain and staff satisfaction improvements. The results are in line with worldwide proof that still supports prior cannulation use of topical anesthetics. The treatment is safe, is possible, and is useful even in a primary care setting.

ACT (Next Steps and Recommendations)

Recommendation

Start and widen the use of EMLA as a standard practice during routine IV cannulation at the health center.

Planned Actions

1. All treatment rooms will have the application of EMLA as a standardized but optional and non-mandatory practice.

- The project will be extended to pediatrics, laboratory services, and other health centers.
- Staff training on the correct application time and technique will be held.
- A Cerner pop-up reminder will be integrated, prompting consideration of topical anesthesia.
- A long-term cost-benefit analysis will be carried out and sustainable supply chain management ensured.

Appendices

Sample patient and staff surveys

IV Cannulation with and without Topical Anesthesia--- Patient Experience Quality project Al Thumama Health Center 2025

Section 1: Patient Information:

1. patient sticker :

2. Have you had IV cannulation before? Yes No

Section 2: Patient Pain Experience

Please rate your pain during the IV cannulation procedure by pointing to the pain level that best represents your experience.

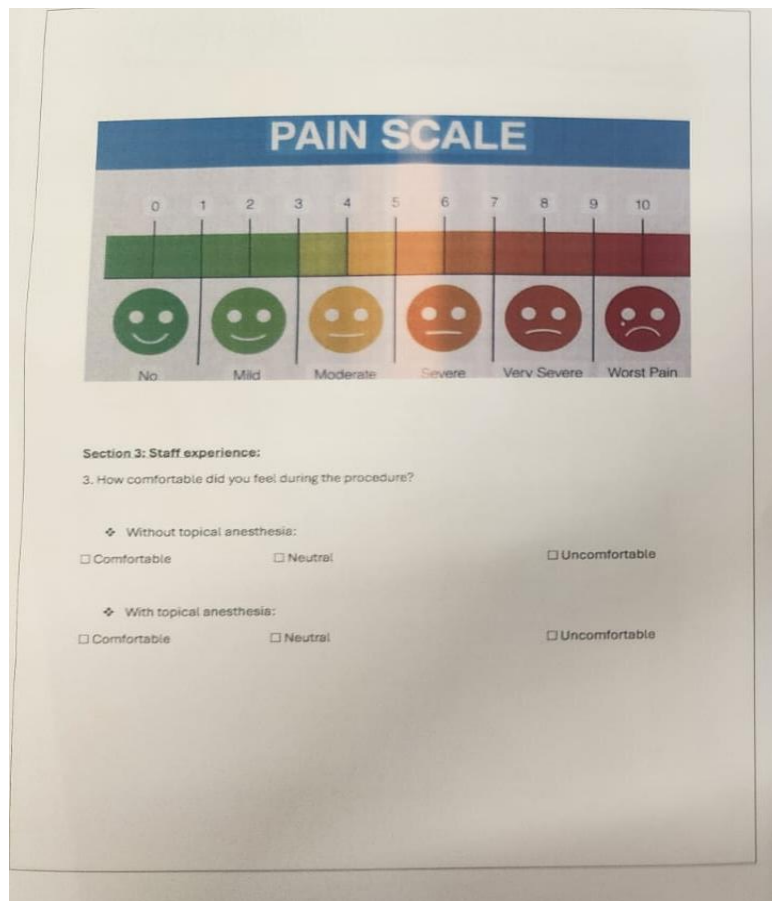
Without topical anesthesia:(Refer to the attached pain scale and circle your rating from 0 to10)

PAIN SCALE

0 1 2 3 4 5 6 7 8 9 10

No Mild Moderate Severe Very Severe Worst Pain

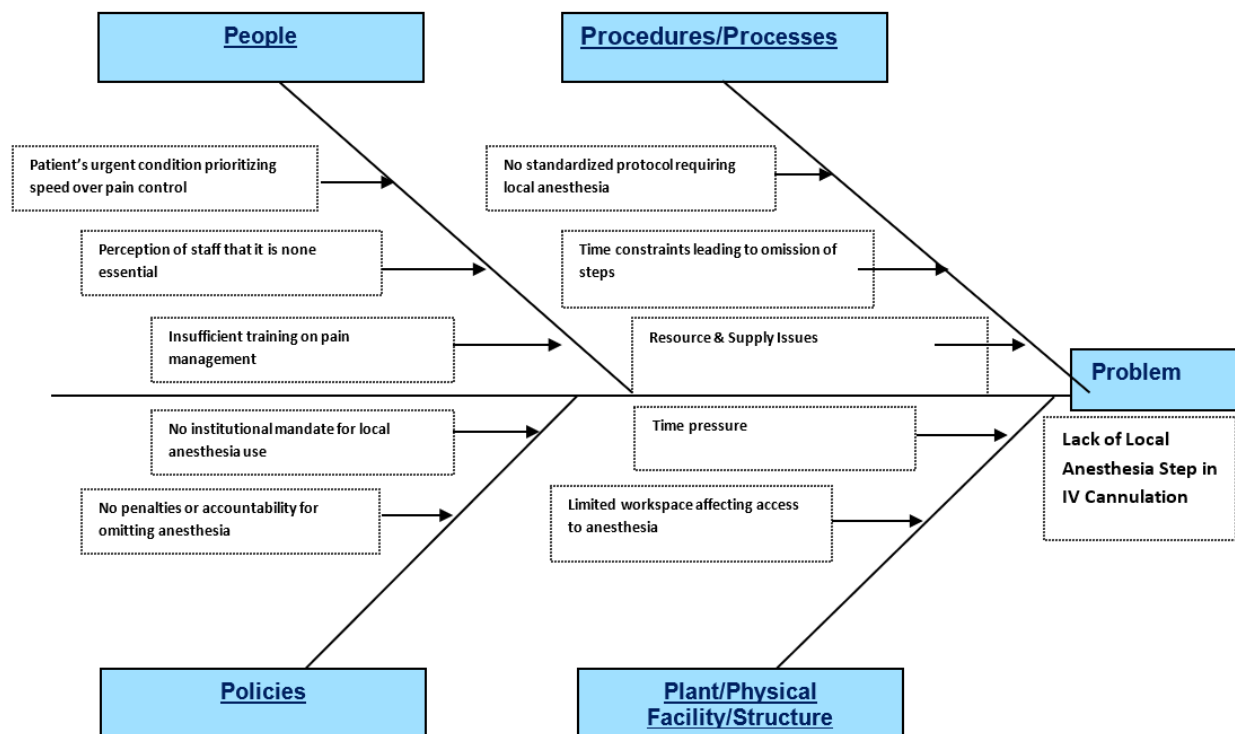
> With topical anesthesia:



Fishbone diagram

Fishbone diagram

Use the fishbone to identify the problem and its related causes: People, Process, Policies and Physical facility/Structure or you may create a new category.



Root Cause Analysis (Summary of Fishbone Analysis) :

- People :Unawareness of the advantages of topical anesthesia
- Wrong impression that anesthesia is not needed
- Undertraining of the staff as regards pain management

Process:

- Lack of a protocol that dictates the use of topical anesthesia
- Time pressured and large patient volume
- Unpredictable workflow in the treatment rooms

Policies :

- No institutional mandate or quality requirement for compliance
- No accountability mechanism that would facilitate the use

Physical Structure :

- ✓ Treatment room space is limited
- ✓ EMLA supplies are not consistently available

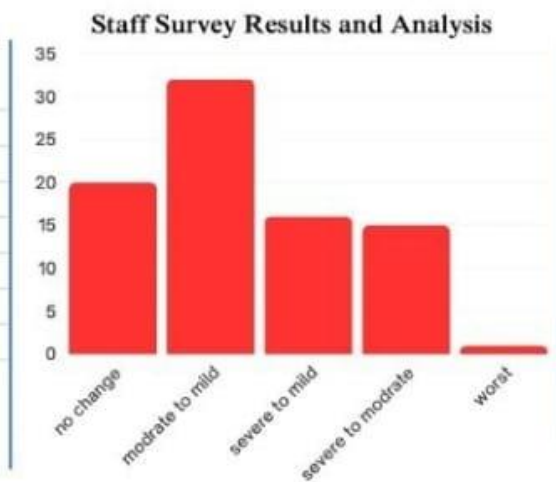
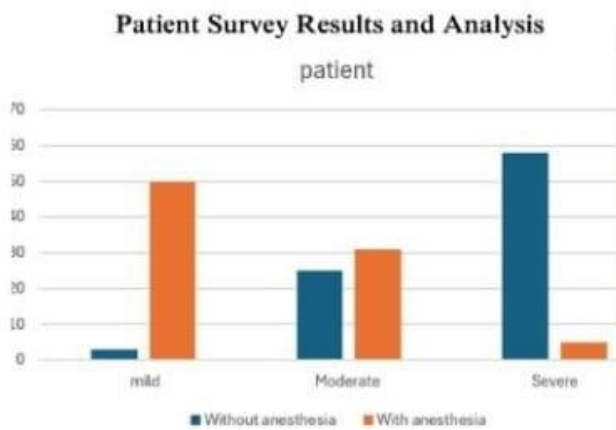
Change Ideas Considered :

- ❖ Making EMLA application prior to IV cannulation a standard procedure
- ❖ Training staff on different methods of pain relief
- ❖ Making use of posters, visual aids, and Cerner alerts
- ❖ Giving treatment room staff the authority to make EMLA requests
- ❖ Future plans for pediatrics and laboratory services expansion

Selected Change for Testing :

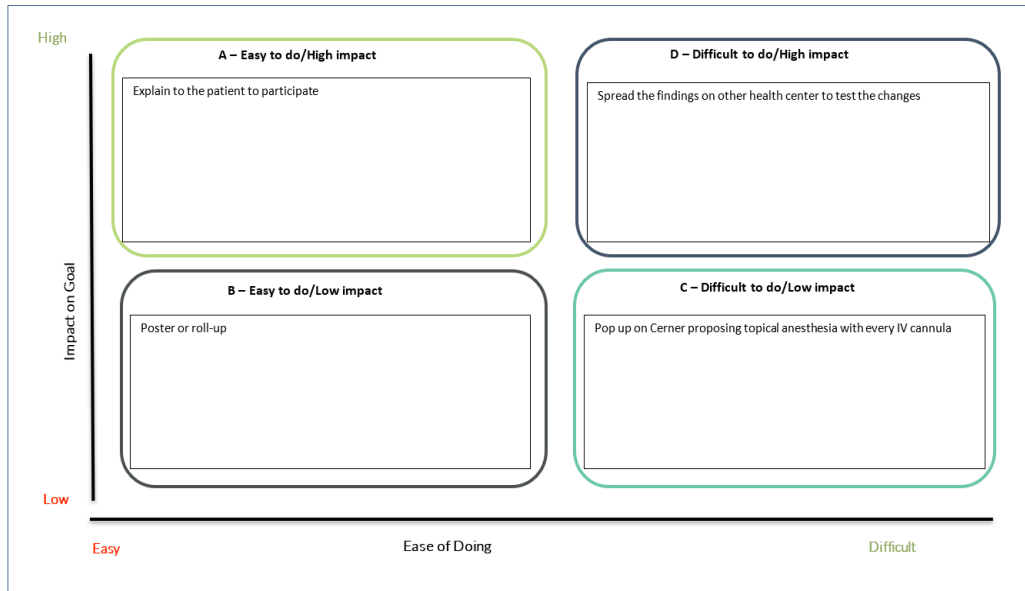
Routine application of topical anesthesia (EMLA) to improve patient comfort and enhance staff experience during IV cannulation.

➤ **Baseline and post-intervention data tables both patients and staff:**



➤ **Priority matrix:**

Prioritization Matrix



➤ **Process mapping:**

Process Map

Use the process map to present the sequence of actions, operations, movements, decisions within a process understand how a process works and the relationship of each steps (Before and/or After the Change)

