

Improving Circumcision Care in the NICU

Team #3

Clinical Safety and Effectiveness Cohort #29



The Team

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Sponsor Department - NICU

**Decrease rate of significant
post-circumcision bleeding
requiring an intervention to
resolve in infants born at
less than 37 weeks
gestation in the UHS NICU
from 6.3% to 4% by March
15, 2024.**

AIM STATEMENT

Background - Context

- An increased number of outpatient urology referrals for routine circumcisions were noticed in the Spring/Summer of 2023
- Premature infants can have increased rates of complications with circumcision such as bleeding and this leaves some providers hesitant to perform the procedure
- Currently there is confusion regarding the circumcision protocol, such as which patient is appropriate and when to perform

Background Data

- UHS NICU has a 7% complication rate for circumcisions overall in 2023 (n=100) (AAP reports 0.2-0.6% complication rate₁)
- The complication rate for premature infants is 6.3% (25% when performed after 6 weeks of life)
 - Jan-Dec 2023 = 64 circs in premature infants, 4 w/ bleeding post circ, 2 significant requiring urological eval
 - 3.1% severe complication rate (increasing to 12.5% after 6 weeks of life)
- Provider Survey
 - Issues with current process of circumcisions in the NICU
 - High level of concern regarding skills to perform and ability to manage complications
 - Willingness of NICU providers to learn a new circumcision technique

Background - Rationale

- Education regarding proper identification of candidates for circumcision, clarity of the circumcision protocol, and alternative methods like Plastibell could increase provider confidence/comfort levels
- Proactive planning and coordination of the circumcision process could facilitate better outcomes
- The Plastibell method can decrease rates of post-procedure bleeding and has lower post care needs (no Vaseline/Bacitracin w/ each diaper change)

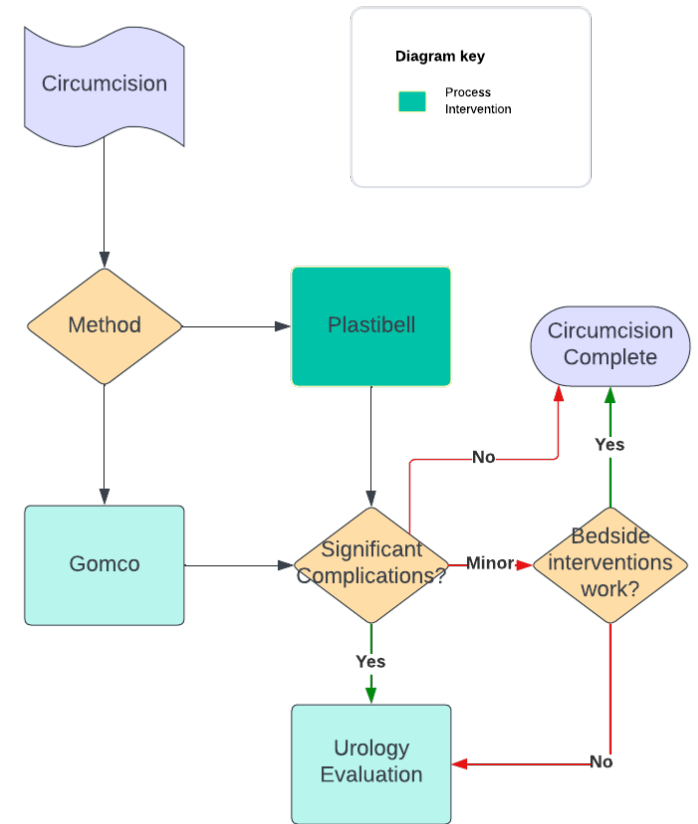
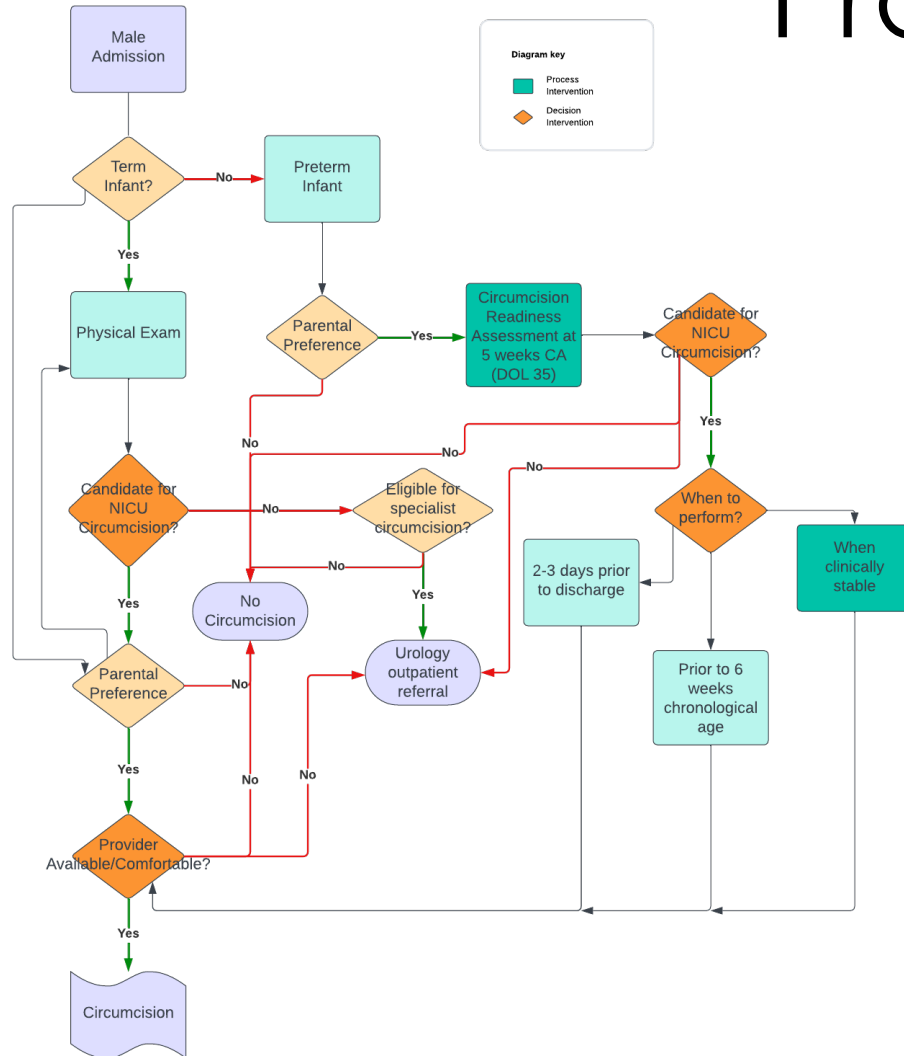
How will we know that change is an improvement?

- Outcome measure: Rate of significant* post-circumcision bleeding
- Process measure: Following protocol, checklist
- Targets for change
 - Resident/Fellow/APP Education
 - Clarify circumcision protocol
 - Checklist in Epic for circumcision readiness assessment
 - Dedicated high-risk circ team
 - New method introduction (Plastibell)/Modifications to current method

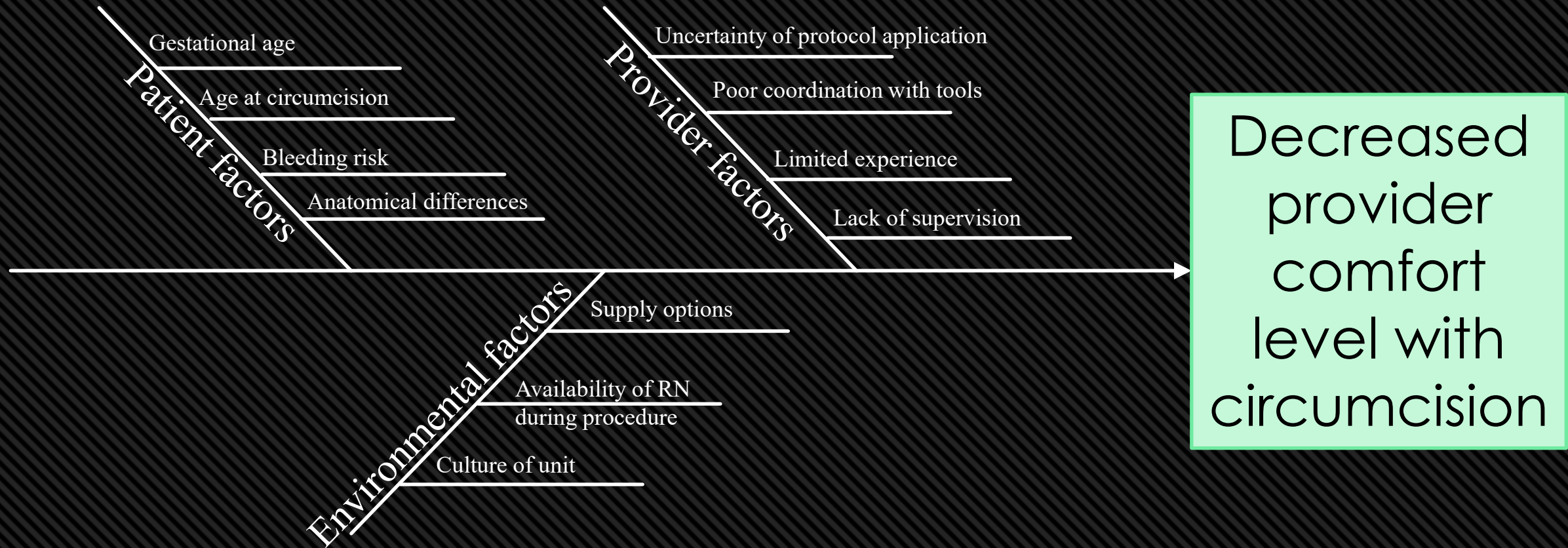


Decision Making Tools

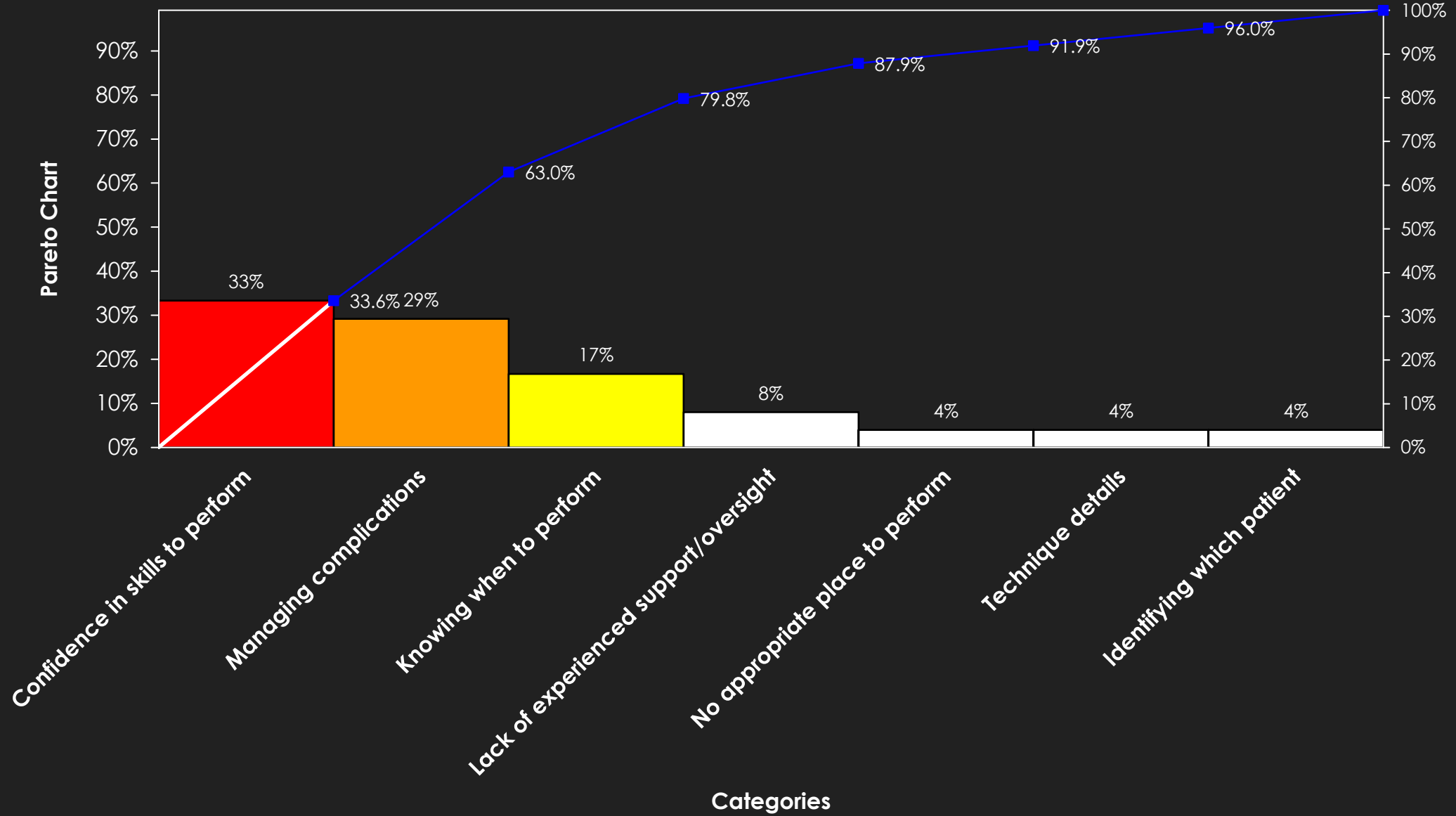
Process Map



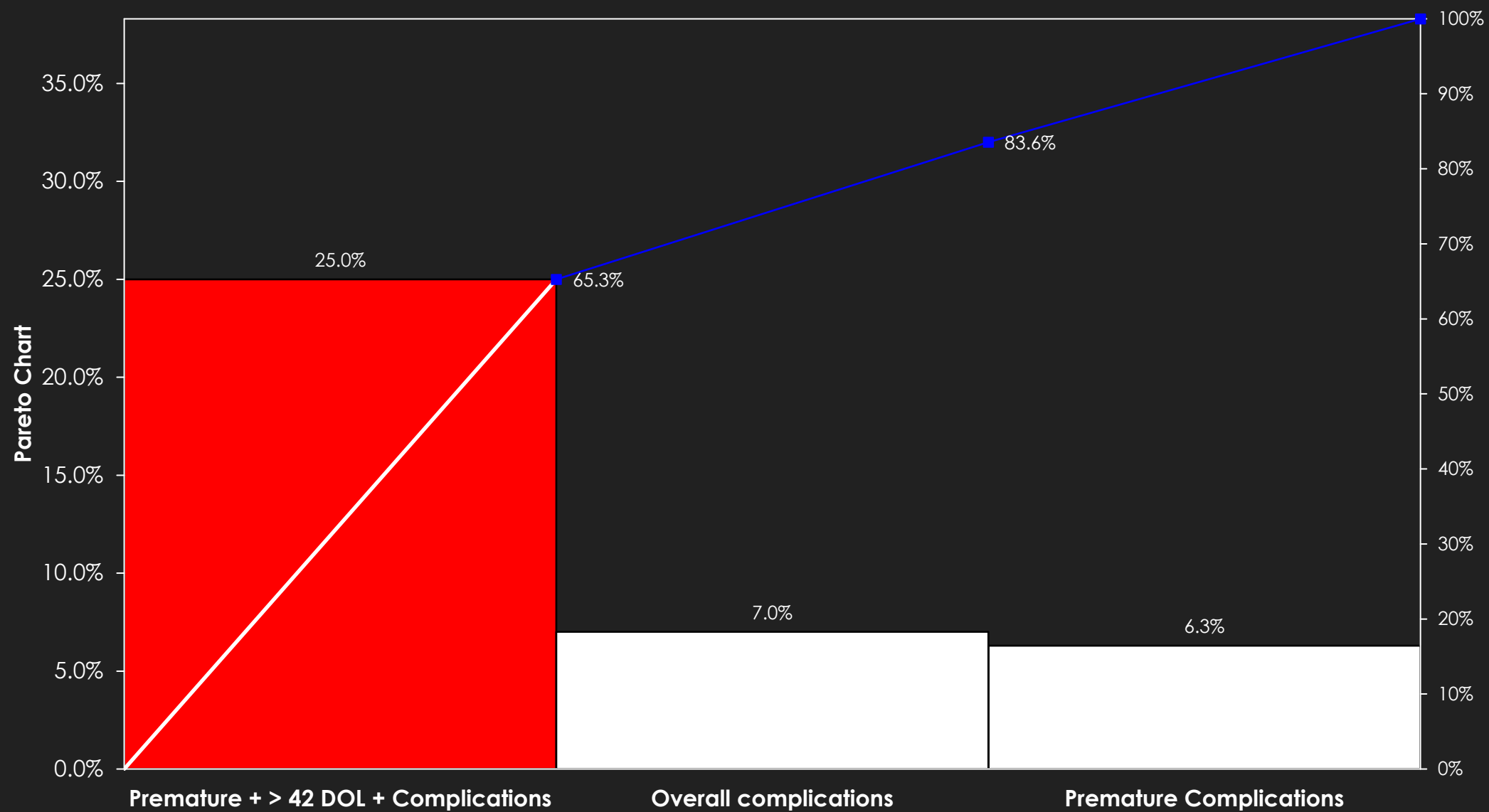
Fishbone Diagram



Pareto Chart – Providers' Biggest Concern



UHS NICU Circumcision Complications Jan-Dec 2023





Driver Diagram

AIM STATEMENT	Primary Drivers	Interventions	Measure	Responsible
Decrease rate of significant post-circumcision bleeding requiring intervention to resolve in infants born at less than 37 weeks gestation in the UHS NICU from 6.3% to 4% by March 15, 2024.	Premature infants at increased risk of bleeding after 6 weeks of life	Clarify/review circumcision protocol		Residents: 12/19 – morning report Fellows/APP: 1/31 – morning report
		Checklist in Epic at 5 weeks of life for circ readiness assessment	Adherence eval	Done 2/14/24
		Introduction of Plastibell method		Pending tools/supplies
	Appropriate timing of circumcision?	Circ checklist based on protocol	Adherence eval	Done 2/14/24
		Reminder at 5 weeks of life for circ readiness assessment		In process
		Experienced circ team for those performed > 42 DOL		Volunteers pending
	Identification of eligible patients for circumcision	Resident/Fellow/APP education regarding contraindications	Pre/post education survey	Residents: 12/19 – morning report Fellows/APP: 1/31- morning report
	Technically difficult procedure if not performed regularly ²	Introduction on Plastibell method		Pending tools/supplies
		Modifications to current procedure; Sim labs		Modifications available
		Appropriate supervision		High Risk Circ Team

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Targets for change

- Resident/Fellow/APP Education
- Clarify circumcision protocol
- Checklist in Epic for circumcision readiness assessment
- Dedicated high-risk circ team
- New method introduction (Plastibell)/Modifications to current method



Circumcision Readiness Assessment

Patient Name: Legend Amir Clark

DOB: 1/25/2024, 5:04 PM

Date of Service: 2/14/2024

Hospital Day: 2

Day of Life: 20 days

CGA: 42w1d

Time of Checklist:

DOL 35-42

Day of Procedure

Anatomy

Is the patients anatomy appropriate for circumcision: Yes, the patient does not have any identifiable exam disqualifiers.

The patient does not have any identifiable disqualifying exam findings such as chordee, torsion or angulation, large fat pad and/or buried penis, mega meatus, epispadias, hypospadias, penoscrotal webbing/decreased penoscrotal angle, undescended testes, or ambiguous genitalia.

High Risk Qualifiers

Appropriate Age and Weight:

Is the patient > 1.8 kg AND < 4.5 kg? YES,NO ▼

Is the patient </= 45 wks CGA? YES,NO ▼

Bleeding Risk:

Bleeding Risk:

Did the patient receive Vit K? YES,NO ▼

Do the parent(s)/guardian(s) decline a family history of hemophilia or Von Willebrand Disease?

YES,NO ▼

Is the patient at low risk for bleeding (no history of or resolved history of thrombocytopenia, no severe cholestasis (Direct Bili >4), no prolonged bleeding from heel sticks and venipuncture sites.

YES,NO ▼

Platelet Count in last 15d: n/a

Respiratory Status:

Is the patient stable on \leq 2L HFNC without significant work of breathing or persistent tachypnea?

YES,NO ▼

Consent:

Has consent been obtained? YES,NO ▼

Circumcision Assessment/Plan

If all the above are marked YES, please coordinate patient's circumcision with high-risk circumcision team within the next 6 days

Using provider discretion for answers marked NO, consider coordinating patient's circumcision with high-risk circumcision team within the next 6 days.

If provider deems patient is **NOT** currently an appropriate candidate for circumcision, patient will require reassessment close to discharge.

- Please contact high-risk circumcision team when close to discharge to coordinate circumcision.
- Please repeat this readiness assessment at time of procedure.

Anatomy

Is the patients anatomy appropriate for circumcision: No

The patient has the following disqualifying exam findings:

Circumcision Disqualifying Exam Findings ▾

Assessment

Disqualifying Assessment Options ▾

- ☐ Chordee
- ☐ Penile Torsion or Angulation
- ☐ Large Fat Pad and or Burried Penis
- ☐ Mega Meatus
- ☐ Epispadias
- ☐ Hypospadias
- ☐ Penoscrotal Webbing / Decreased Penoscrotal Angle
- ☐ Undescended Testes
- ☐ Ambiguous Genetalia
- ☐ Other: ***

Jordan R Kang

9:42 PM

02/14/24

Anatomy

Is the patient's anatomy appropriate for circumcision: No

The patient has the following disqualifying exam findings:

Circumcision Disqualifying Exam Findings ▼

Assessment

Disqualifying Assessment Options ▼

- ☐ The patient should be reassessed prior to discharge
- ☐ The patient should receive a Pediatric Urology referral for circumcision consultation as an outpatient

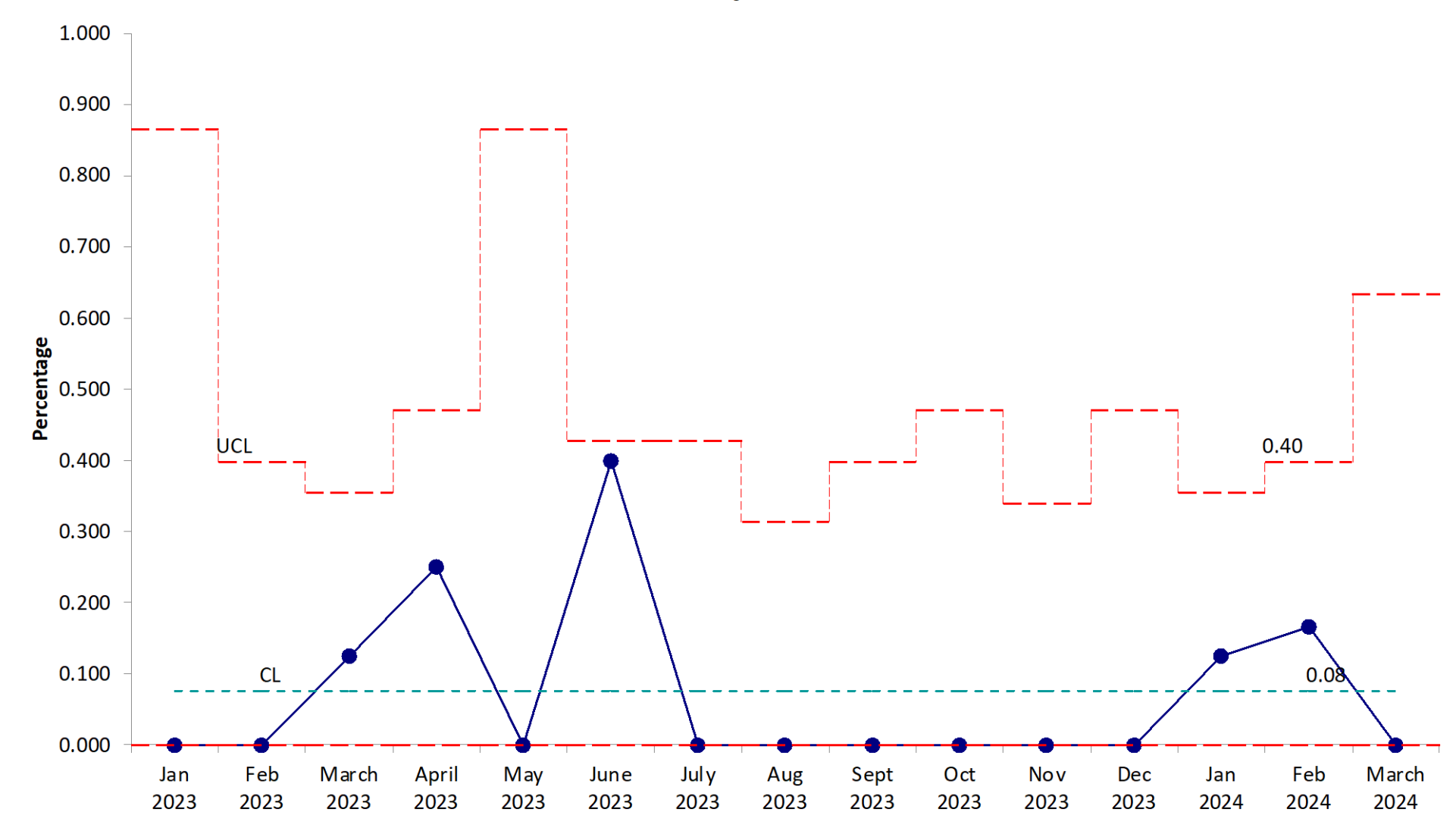
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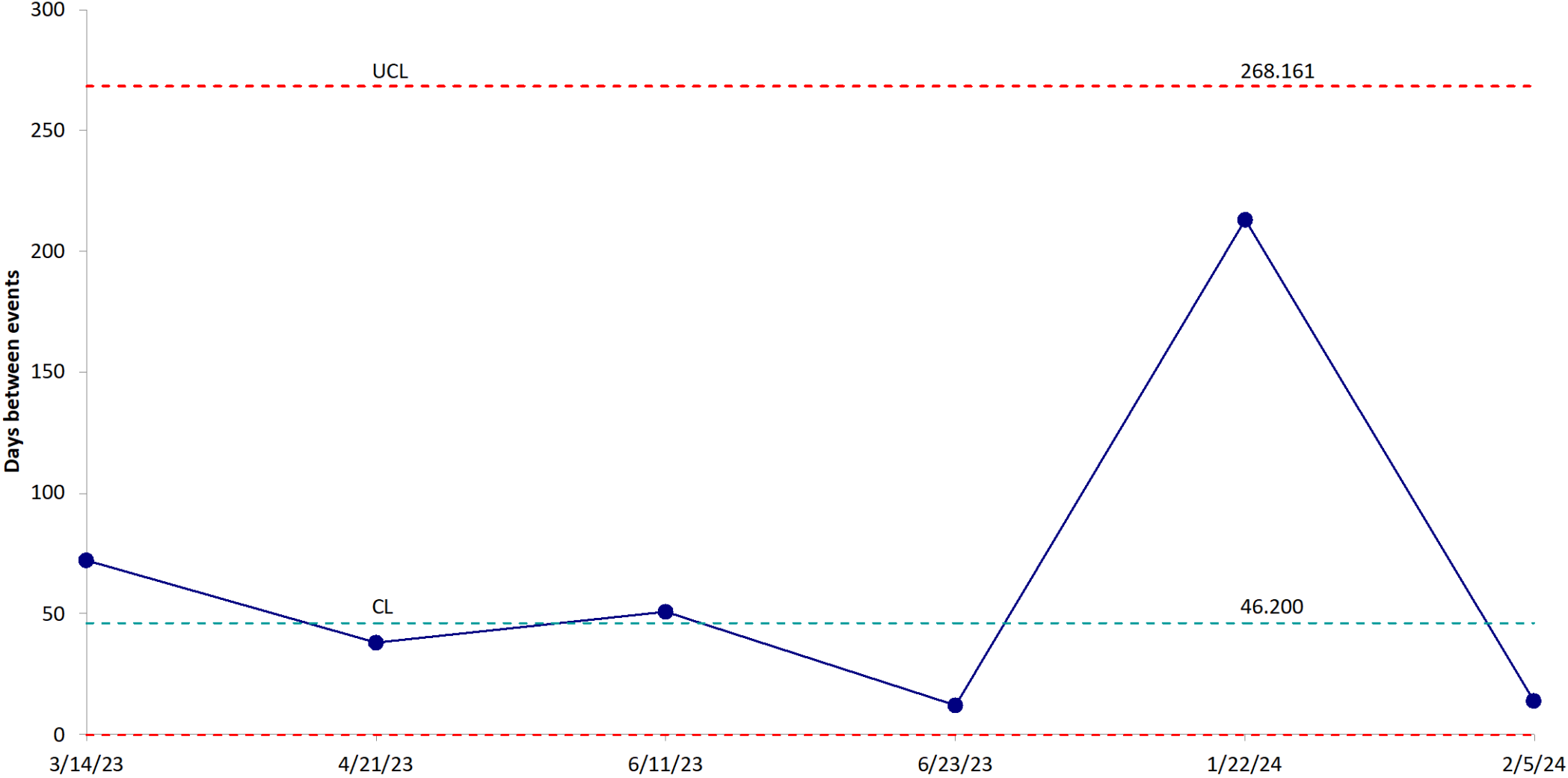
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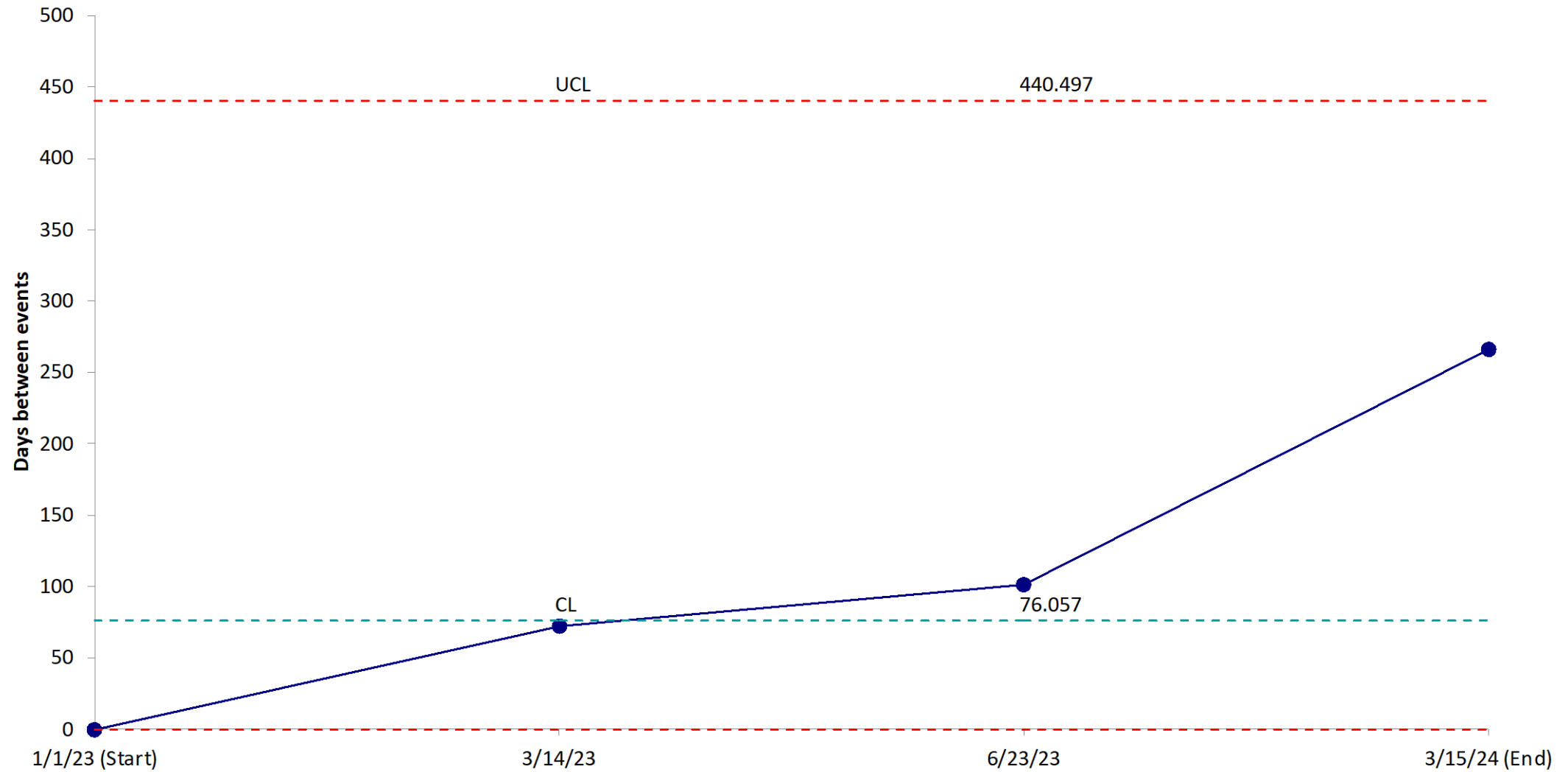
Premature Circumcision Complications Jan '23 - March '24



Days Between Premature Circumcision Complications Jan '23 - March '24



Days Between Severe Circumcision Complications Jan '23 - March '24



Return on Investment	No complication	Bleeding complication	Complication requiring intervention
<u>Inpatient procedure</u>	\$88 - 195 ^{3, 4, 5, 6} (usually included in L&D cost)	\$88 - 195 ^{3, 4, 5, 6} (usually included in L&D cost)	\$88 - 195 ^{3, 4, 5, 6} (usually included in L&D cost)
Bleeding complication cost		\$500 ₃	\$500 ₃
Provider time cost (assuming holding pressure for 15 min 1-3x)		\$6.50 - 19.50 ₇	\$6.50 - 19.50 ₇
Reoperation cost			\$2,500 ₃
Total	\$88 - 195	\$594.50 - 714.50	\$3,094.50 - 3,214.50

Parent's Anxiety	Low	Moderate	High
Anesthesia Risk	Low (local)	Low (local)	Low - Moderate
Post-operative Pain	Low	Low - Moderate	Low - Moderate

Return on Investment	Cost
<u>Outpatient procedure</u>	\$486.76 – 6,848 ^{4, 5, 8, 9} (Texas average \$1,377)
Anesthesiologist	\$107 ¹⁰
Cost of initial urology visit	\$141 – 260 ¹¹
Cost of follow-up urology visit	\$177 ¹²
Parent cost to be at initial visit (assumed to be 4h or a half-day of work)	\$90.84 ^{3, 13}
Parent cost to be at follow-up visit (assumed to be 4h or a half-day of work)	\$90.84 ^{3, 13}
Transportation cost (assuming most people live between 10-20 miles from the clinic averaging 25 mpg)	\$1.16 – 2.33 ¹⁴
Total	\$917.60 – 7,576.01

Parent's Anxiety	Moderate - High
Anesthesia Risk	Moderate – High (general)
Post-operative Pain	Low - Moderate



Conclusions

- While our AIM Statement goal was not met, the journey towards reaching this goal has led to significant improvements in the process of circumcision in our NICU
- Further implementation of the tools developed in this project will continue to improve our outcomes in our smallest of patients
- Our overall rate of severe complications (requiring urological evaluation/management) have remained very low and the number of days between significant complications continues to widen

What's next?

- Plastibell implementation/sustainment?
- Identification of further educational/knowledge gaps (i.e. post-circumcision care)
- Continued monitoring for sustained change/improvement
 - Barriers include unit census/acuity, temporary nature of resident/fellowship training, other QI projects ongoing

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Thank You!