



KEY DRIVERS OF CHANGE

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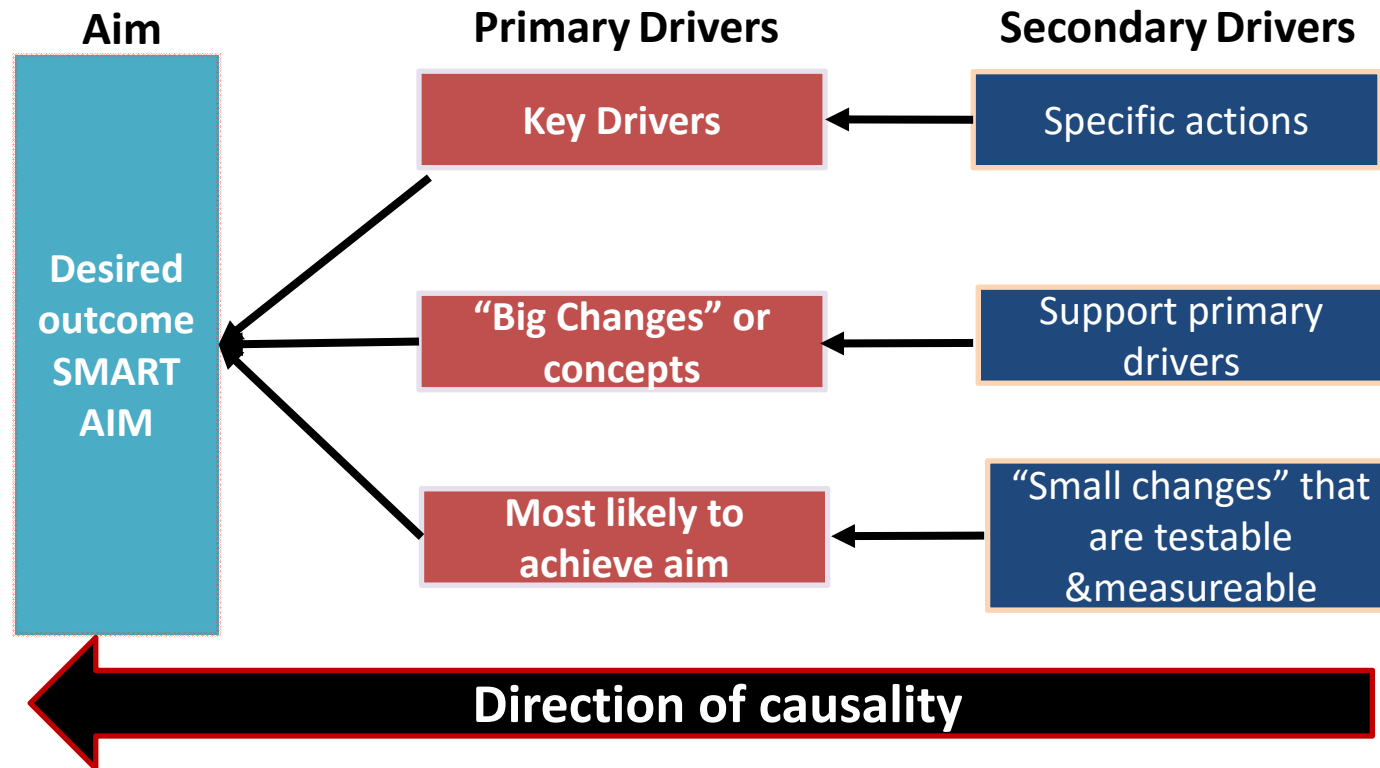
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Partnering to Improve Health Care Quality
for Mothers and Babies

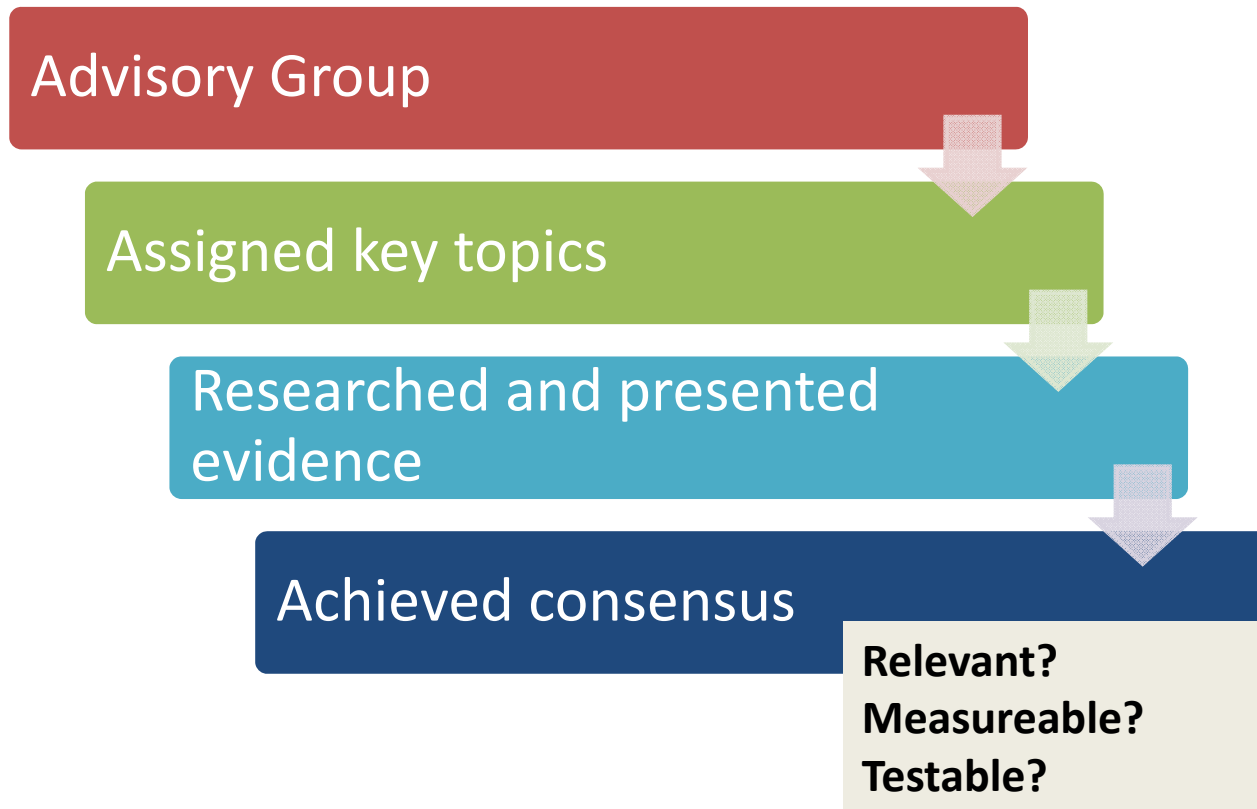


Key Driver basic concepts



https://app.smartsheet.com/b/home?lang=en_US

How our NAS Key Driver was developed



Primary Aim & Inclusion/Exclusion criteria

Aim

By 6/2020, FPQC participating hospitals will have a 20% decrease in average length of stay^{1,2} for infants ≥ 37 weeks GA diagnosed with NAS regardless of inpatient hospital location.

¹ **Baseline length of stay** pending – derived from an average of each hospital's baseline LOS

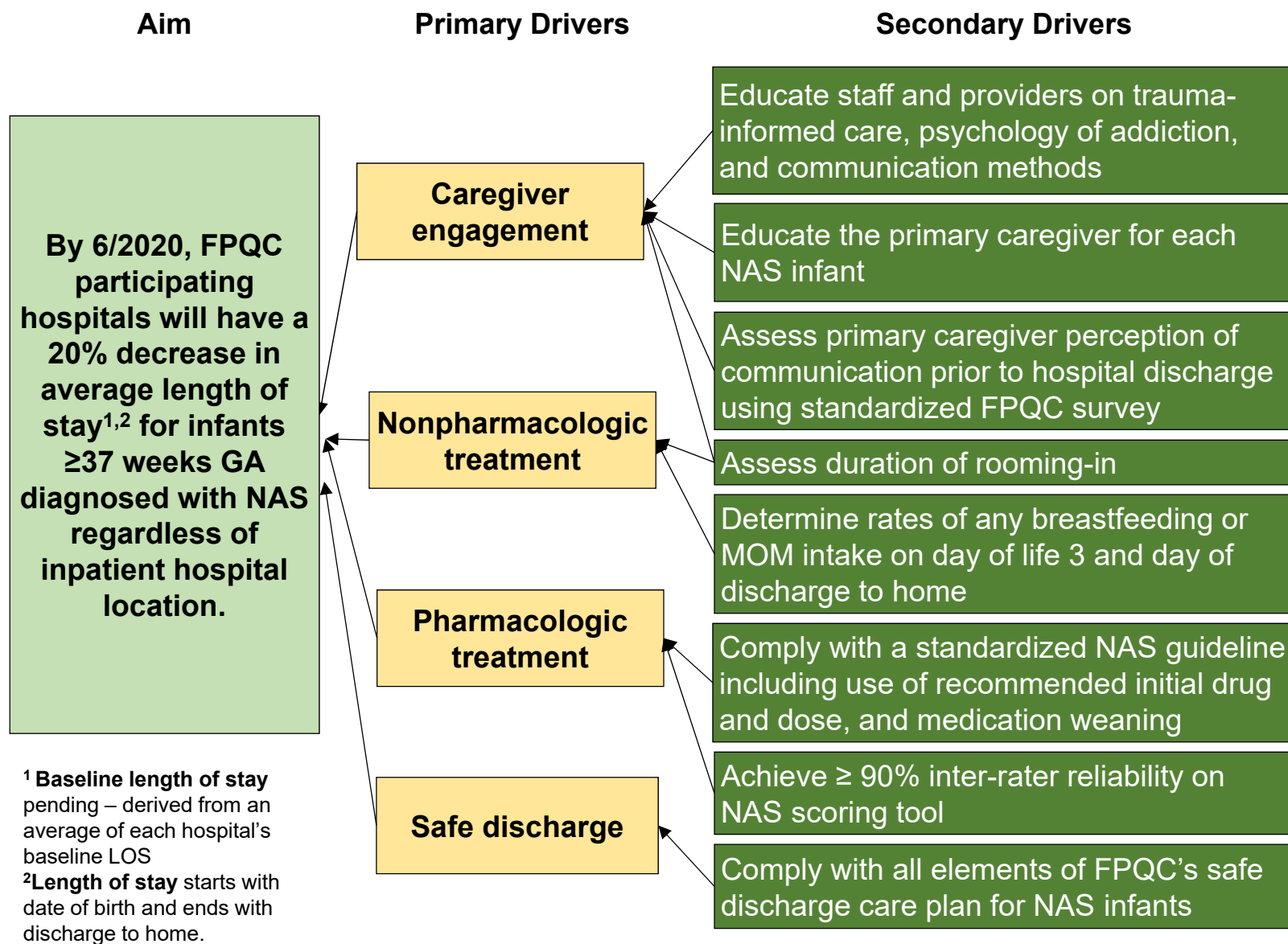
² **Length of stay** starts with date of birth and ends with discharge to home.

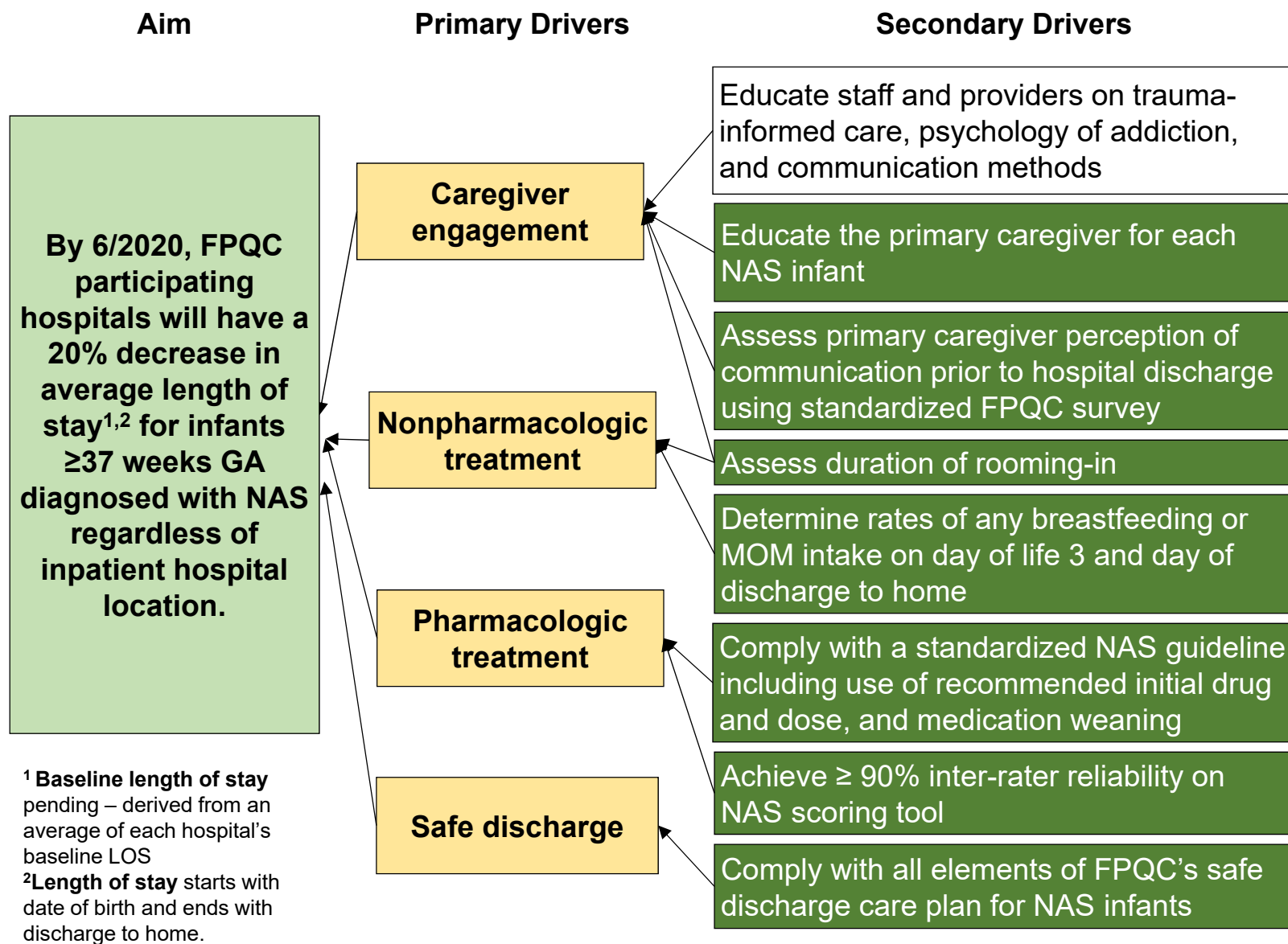
INCLUDES	EXCLUDES
<ul style="list-style-type: none">• Gestational age ≥ 37 weeks• Infant admitted in any hospital location with <u>NAS diagnosis</u> (ICD-10 = P96.1)<ul style="list-style-type: none">• Clinical signs• Severity of signs requires treatment beyond observation period (non-pharmacologic and/or pharmacologic)• +/- maternal history• +/- lab confirmation	<ul style="list-style-type: none">• Readmissions• Iatrogenic withdrawal• Conditions which in themselves may prolong length of hospital stay (e.g., major congenital anomalies, genetic syndromes, HIE, surgical diagnoses)

Balancing Measure: Outpatient medication management for NAS

- Are changes designed to improve one part of the system causing new problems in other parts of the system?

Operational Definition	Goal
Numerator: # of infants discharged home with any medications to manage NAS symptoms Denominator: # of infants $\geq 37\ 0/7$ weeks GA admitted anywhere in the hospital with a diagnosis of NAS and started on medication Exclusion: None	Would not expect to increase over time





Staff education: evidence

- Co-occurring diagnosis of Post Traumatic Stress Disorder and Substance Abuse Disorders (SUD) in women – 30-59%¹
- Application of **trauma-informed care** is suggested to create a supportive environment and establish good relationships²



1. Najavits, L.M., (2002) *Seeking Safety: A Treatment Manual for PTSD and Substance Abuse*. New York: Guilford
2. Marcellus L. Supporting women with substance use issues: trauma-informed care as a foundation for practice in the NICU. *Neonatal Netw* 2014;33:307-14.
3. SAMHSA. Trauma-informed approach and trauma-specific interventions. Retrieved from <https://www.samhsa.gov/nctic/trauma-interventions>
4. Blanch A, Filson B, Penney D. Engaging women in trauma-informed peer support: A guidebook. National Center for Trauma-Informed Care. Retrieved from <https://www.nasmhpd.org/content/engaging-women-trauma-informed-peer-support-guidebook>

Staff education: evidence

- ☉ Lack of knowledge about substance abuse and treatment leads to judgmental attitudes¹⁻³
- ☉ Staff education programs aimed at improving **interviewing skills** and increasing **knowledge of addiction** improve relationships with NAS families and enhance mother-infant interactions⁴⁻⁶
- ☉ **Motivational interviewing** is a clinical approach that helps people with SUD make positive behavioral changes⁷



1. Atwood EC, Sollender G, Hsu E, et al. A Qualitative Study of Family Experience With Hospitalization for Neonatal Abstinence Syndrome. *Hosp Pediatr* 2016;6:626-32.
2. Cleveland LM, Bonugli R. Experiences of mothers of infants with neonatal abstinence syndrome in the neonatal intensive care unit. *J Obstet Gynecol Neonatal Nurs* 2014;43:318-29.
3. Fraser JA, Barnes M, Biggs HC, Kain VJ. Caring, chaos and the vulnerable family: experiences in caring for newborns of drug-dependent parents. *Int J Nurs Stud* 2007;44:1363-70.
4. Corse SJ, McHugh MK, Gordon SM. Enhancing provider effectiveness in treating pregnant women with addictions. *J Subst Abuse Treat* 1995;12:3-12.
5. Gerace LM, Hughes TL, Spunt J. Improving nurses' responses toward substance-misusing patients: a clinical evaluation project. *Arch Psychiatr Nurs* 1995;9:286-94.
6. French ED, Pituch M, Brandt J, Pohorecki S. Improving interactions between substance abusing mothers and their substance-exposed newborns. *J Obstet Gynecol Neonatal Nurs* 1998;27:262-9.
7. SAMHSA. Motivational interviewing. Retrieved from <https://www.integration.samhsa.gov/clinical-practice/motivational-interviewing>

Staff education: evidence

- ☺ Staff should be well-versed on NAS signs, NAS scoring, and non-pharmacologic techniques of NAS management to facilitate parent participation in care and decision-making.¹
- ☺ Knowledge facilitates:
 - ☺ Informed discussions with families
 - ☺ Family education
 - ☺ Set realistic expectations related to NAS outcomes



1. Institute for Patient and Family Centered Care. at <http://www.ipfcc.org/about/pfcc.html>.

Staff education: recommendation/measure

- 👤 **Recommend staff receive education on bundle** which includes: 1) trauma-informed care, 2) psychology of addiction, 3) motivational interviewing, and 4) NAS symptoms, scoring, and non-pharmacologic techniques
- 👤 Small 15 minute segments accessible via FPQC website
- 👤 Separate % for EACH topic

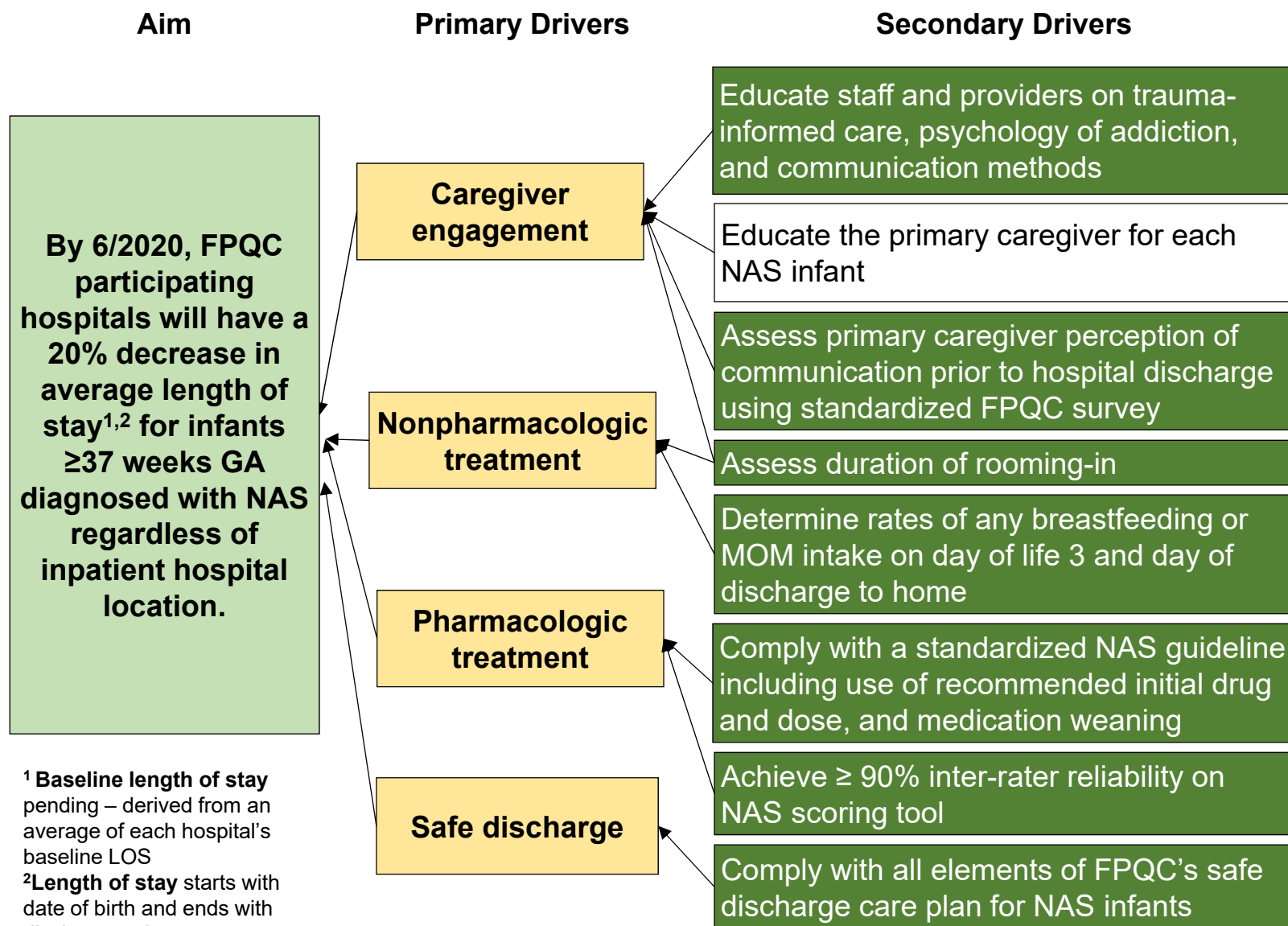
Operational Definition	FPQC Goal
<i>Numerator:</i> # of nurses, advance practice nurses (ARNPs, PAs), and physicians who receive education on <u>EACH</u> topic of the NAS education bundle to date	≥ 80% for <u>EACH</u> topic
<i>Denominator:</i> Total # of nurses, advance practice nurses (ARNPs, PAs), and physicians who care for NAS infants to date	
<i>Exclusion:</i> OB providers	

Tips on how to measure

- 🕒 Hospitals track completion
- 🕒 Attestation of completion
- 🕒 Roster
- 🕒 Assign via Learning Management System
- 🕒 Present at standing staff meeting
- 🕒 Incorporate into educational session



<https://gwenhernandez.com/2016/07/06/tracking-progress-in-scrivener-up-at-writer-unboxed/>



Primary caregiver education: evidence

- 👤 NAS primary caregivers crave knowledge and desire more education¹
- 👤 Support, coaching, and education provided to primary caregivers results in significant decreases in morphine use and increases in breastfeeding rates²
- 👤 When clinicians engage and empower primary caregivers, they nourish a collaborative relationship based on mutual trust and rapport³⁻⁵
- 👤 Information should be timely, complete and accurate so families can effectively participate in care and decision-making⁶

1. Holmes AV, Atwood EC, Whalen B, et al. Rooming-In to Treat Neonatal Abstinence Syndrome: Improved Family-Centered Care at Lower Cost. *Pediatrics* 2016;137.
2. Grossman MR, Berkwitz AK, Osborn RR, et al. An Initiative to Improve the Quality of Care of Infants With Neonatal Abstinence Syndrome. *Pediatrics* 2017;139.
3. Ortenstrand A, Westrup B, Broström EB, et al. The Stockholm Neonatal Family Centered Care Study: effects on length of stay and infant morbidity. *Pediatrics* 2010;125:e278-85.
4. White-Traut RC, Rankin KM, Yoder JC, et al. Influence of H-HOPE intervention for premature infants on growth, feeding progression and length of stay during initial hospitalization. *J Perinatol* 2015;35:636-41.
5. Boundy EO, Dastjerdi R, Spiegelman D, et al. Kangaroo Mother Care and Neonatal Outcomes: A Meta-analysis. *Pediatrics* 2016;137.
6. Institute for Patient and Family Centered Care. at <http://www.ipfcc.org/about/pfcc.html>.)

Primary caregiver education: evidence

- ☉ Infants with NAS are increased risk for sleep related deaths¹⁻²
- ☉ Inconsolable or frequent crying increases an infant's risk for being shaken³



1. Sudden Infant Death Syndrome (SIDS) Risk Factors. 2018. at <http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/sudden-infant-death-syndrome-sids/sids-syndrome-risk.html>.)
2. Task Force on Sudden Infant Death Syndrome. SIDS and Other Sleep-Related Infant Deaths: Updated 2016 Recommendations for a Safe Infant Sleeping Environment. Pediatrics 2016;138.
3. A journalist's guide to shaken baby syndrome: A preventable tragedy. 2014. at https://americanspcc.org/wp-content/uploads/2014/01/sbs_media_guide_cdc.pdf.

Primary caregiver education: recommendation/measure

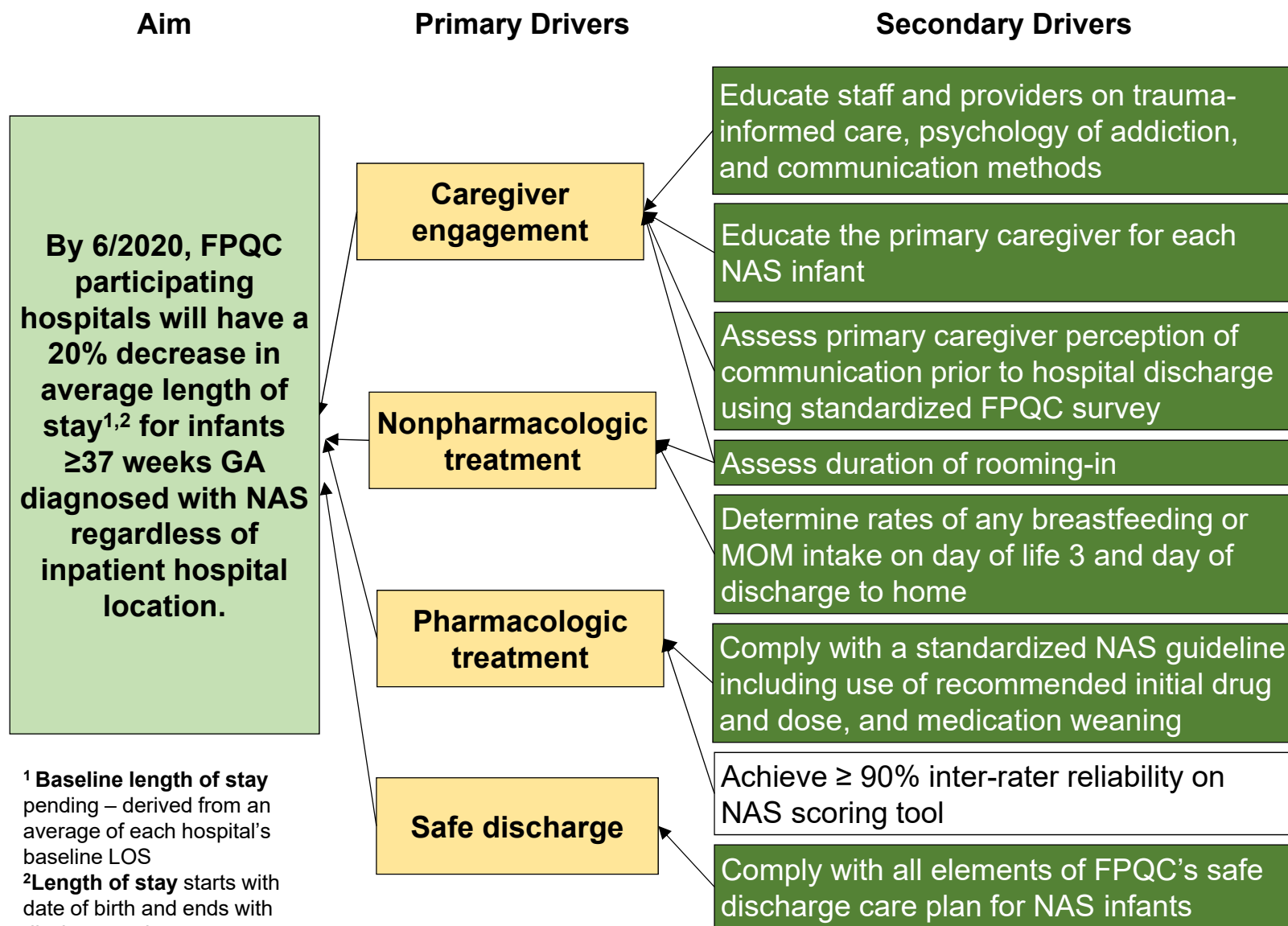
- 👤 **Recommend primary caregiver receive education on bundle** which includes all of the following: 1) safe sleep, 2) expectations of hospital stay, 3) shaken baby syndrome, 4) postpartum depression, 5) NAS symptoms, scoring, and nonpharmacologic techniques.
- 👤 **Only one primary caregiver per NAS infant needs to receive education bundle**

Operational Definition	FPQC Goal
Numerator: # of primary caregivers with documented completion of ALL topics of the NAS education bundle Denominator: # of infants ≥ 37 0/7 weeks GA admitted anywhere in the hospital with a diagnosis of NAS Exception: foster care placement does not require safe sleep, shaken baby syndrome, and postpartum depression; non-biological mother placement does not require postpartum depression	$\geq 80\%$

Tips on how to measure

- Develop a checklist on paper – scan into EMR at discharge
- Develop an EMR checklist or template
- Use existing documentation in EMR
- Manual audit
- Build electronic report





Inter-rater reliability: definition

- Defined as *“the degree to which two independent raters or observers watch the same event at the same time, document what they observe independently, and after completing the independent ratings, compare each other’s ratings for the attribute or event being observed and look for items of agreement or disagreement.”*

D'Apolito KC. Assessing neonates for neonatal abstinence: are you reliable? J Perinat Neonatal Nurs 2014;28:220-31.

Inter-rater reliability: evidence

- 👤 No consensus on validated tool – Modified Finnegan Neonatal Abstinence Scoring Tool is most commonly used¹⁻³
- 👤 Crucial that staff performing assessments demonstrate good inter-rater or inter-observer reliability
- 👤 Competency should be assessed regularly⁴
- 👤 Compliance with a validated scoring tool can improve NAS outcomes^{6,7}
- 👤 $\geq 90\%$ inter-rater reliability between scorers is recommended⁵

1. Sarkar S, Donn SM. Management of neonatal abstinence syndrome in neonatal intensive care units: a national survey. *J Perinatol* 2006;26:15-7.
2. O'Grady MJ, Hopewell J, White MJ. Management of neonatal abstinence syndrome: a national survey and review of practice. *Arch Dis Child Fetal Neonatal Ed* 2009;94:F249-52.
3. Mehta A, Forbes KD, Kuppala VS. Neonatal Abstinence Syndrome Management From Prenatal Counseling to Postdischarge Follow-up Care: Results of a National Survey. *Hosp Pediatr* 2013;3:317-23.
4. D'Apolito KC. Assessing neonates for neonatal abstinence: are you reliable? *J Perinat Neonatal Nurs* 2014;28:220-31
5. K DA. A scoring system for assessing neonatal abstinence syndrome. Instruction manual 1994.
6. Patrick SW, Schumacher RE, Horbar JD, et al. Improving Care for Neonatal Abstinence Syndrome. *Pediatrics* 2016;137.
7. Hall ES, Wexelblatt SL, Crowley M, et al. Implementation of a Neonatal Abstinence Syndrome Weaning Protocol: A Multicenter Cohort Study. *Pediatrics* 2015;136:e803-10.

Inter-rater reliability: recommendation/measure

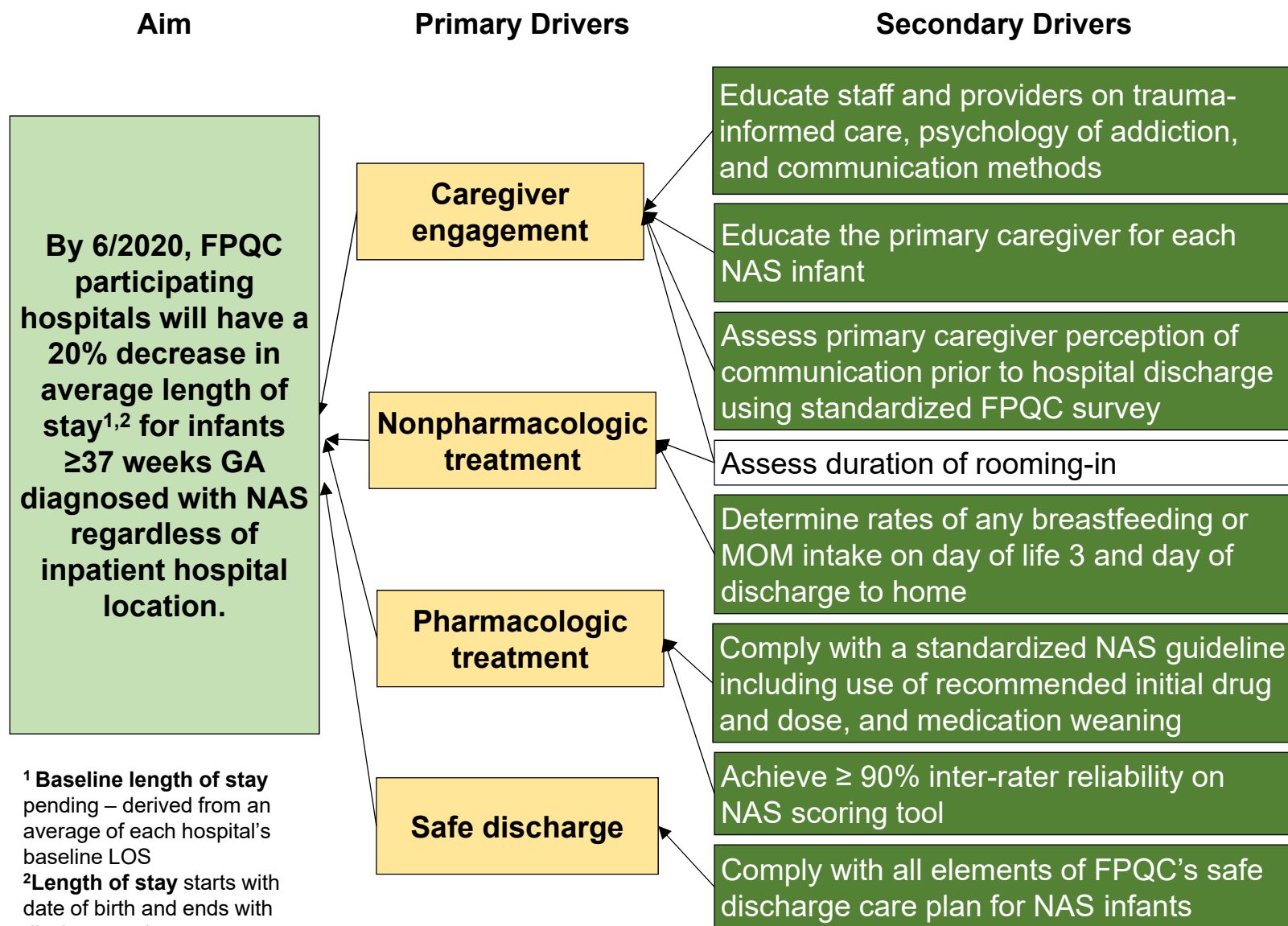
- 👤 **Recommend scorers achieve $\geq 90\%$ inter-rater reliability with chosen tool**
- 👤 **Use a standardized tool with face validity**
- 👤 Institution defines which “nurses” are included
- 👤 Institution determines how to measure inter-rater reliability
- 👤 Denominator may change from quarter to quarter

Operational Definition	FPQC Goal
Numerator: # of current “nurses” who have demonstrated $\geq 90\%$ inter-rater reliability with your institution’s NAS scoring tool	$\geq 75\%$
Denominator: Total # of current “nurses” caring for NAS infants to date	
Exclusion: institution decides which nurses to exclude	

Tips on how to measure

- Modified Finnegan – agree on 18 of 20 elements (90% reliability)
- Purchase *Assessing Signs and Symptoms of Neonatal Abstinence Using the Finnegan Scoring Tool*
<https://neoadvances.myshopify.com/collections/products>
- Prices range from \$70 to \$2,120
- Determine reliability in a classroom setting or individually





Rooming-in: evidence

- 👤 Lower levels of neonatal care (i.e., postnatal ward or nursery) that facilitate rooming-in have been associated with decreased need for medication, treatment duration, hospital stay and cost of care^{1,2,3}
- 👤 Rooming in facilitates skin-to-skin contact.⁴⁻⁶
- 👤 Benefits of rooming-in include increased breastfeeding rates, reduced need for medications, shorter length of hospital stay, improved retention rate of custody, more effective hospital resource utilization and lower cost of care.^{1,2,7-12}

1. Holmes AV, Atwood EC, Whalen B, et al. Rooming-In to Treat Neonatal Abstinence Syndrome: Improved Family-Centered Care at Lower Cost. *Pediatrics* 2016;137.
2. Saiki T, Lee S, Hannam S, Greenough A. Neonatal abstinence syndrome--postnatal ward versus neonatal unit management. *Eur J Pediatr* 2010;169:95-8.
3. Loudin S, Werthammer J, Prunty L, Murray S, Shapiro JI, Davies TH. A management strategy that reduces NICU admissions and decreases charges from the front line of the neonatal abstinence syndrome epidemic. *J Perinatol* 2017;37:1108-11.
4. Ryan G, Dooley J, Gerber Finn L, Kelly L. Nonpharmacological management of neonatal abstinence syndrome: a review of the literature. *J Matern Fetal Neonatal Med* 2018;1-6.
5. Hiles M. An evidence based intervention for promoting sleep in infants experiencing neonatal abstinence syndrome due to maternal methadone use. *Clin Nurse Spec* 2011;25:153-8.
6. Feldman-Winter L, Goldsmith JP, NEWBORN COFA, SYNDROME TFOSID. Safe Sleep and Skin-to-Skin Care in the Neonatal Period for Healthy Term Newborns. *Pediatrics* 2016;138.
7. Pryor JR, Maalouf FI, Krans EE, Schumacher RE, Cooper WO, Patrick SW. The opioid epidemic and neonatal abstinence syndrome in the USA: a review of the continuum of care. *Arch Dis Child Fetal Neonatal Ed* 2017;102:F183-F7.
8. Grossman MR, Berkowitz AK, Osborn RR, et al. An Initiative to Improve the Quality of Care of Infants with Neonatal Abstinence Syndrome. *Pediatrics* 2017;139.
9. Abrahams RR, Kelly SA, Payne S, Thiessen PN, Mackintosh J, Janssen PA. Rooming-in compared with standard care for newborns of mothers using methadone or heroin. *Can Fam Physician* 2007;53:1722-30.
10. Grossman M, Seashore C, Holmes AV. Neonatal Abstinence Syndrome Management: A Review of Recent Evidence. *Rev Recent Clin Trials* 2017;12:226-32.
11. Kocherlakota P. Neonatal abstinence syndrome. *Pediatrics* 2014;134:e547-61.
12. MacMilan K, Rendon C, Verma K, Riblet N, Washer D, Holmes A. Association of rooming-in with outcomes for neonatal abstinence syndrome. A systematic review and meta-analysis. *JAMA Pediatrics* 2018;172:345-51.

Rooming-in: evidence

- ⦿ Risks of rooming-in include accidental suffocation, infant falls, and hospital readmissions for undertreated NAS or failure to thrive.¹
- ⦿ Barriers to rooming-in include maternal stigma or guilt, maternal medical needs (e.g., illness, medical appointments, MAT treatments, group meetings), transportation difficulties, work obligations, other children in the home, legal constraints (i.e., involvement of child protective services, incarceration), hospital culture, or hospital resource allocation.²⁻⁴

1. MacMilan K, Rendon C, Verma K, Riblet N, Washer D, Holmes A. Association of rooming-in with outcomes for neonatal abstinence syndrome. A systematic review and meta-analysis. JAMA Pediatrics 2018;172:345-51.
2. Pryor JR, Maalouf FI, Krans EE, Schumacher RE, Cooper WO, Patrick SW. The opioid epidemic and neonatal abstinence syndrome in the USA: a review of the continuum of care. Arch Dis Child Fetal Neonatal Ed 2017;102:F183-F7.
3. Holmes AV, Atwood EC, Whalen B, et al. Rooming-In to Treat Neonatal Abstinence Syndrome: Improved Family-Centered Care at Lower Cost. Pediatrics 2016;137.
4. Atwood EC, Sollender G, Hsu E, et al. A Qualitative Study of Family Experience with Hospitalization for Neonatal Abstinence Syndrome. Hosp Pediatr 2016;6:626-32.

Rooming-in: recommendation/measure

- 👤 **Recommend caregiver spends ≥ 6 hrs/day rooming-in**
- 👤 Primary caregiver is preferred
- 👤 Even with encouragement and support, some primary caregivers will not be able to room-in 6 hrs/day, therefore hospitals can include “cuddlers”

Operational Definition	FPQC Goal
Numerator: # of hospital days where caregiver spent ≥ 6 hours rooming-in with infant	$\geq 50\%$
Denominator: Total # of hospital days for ALL infants ≥ 37 0/7 weeks GA admitted anywhere in the hospital with a diagnosis of NAS	

Tips on how to measure

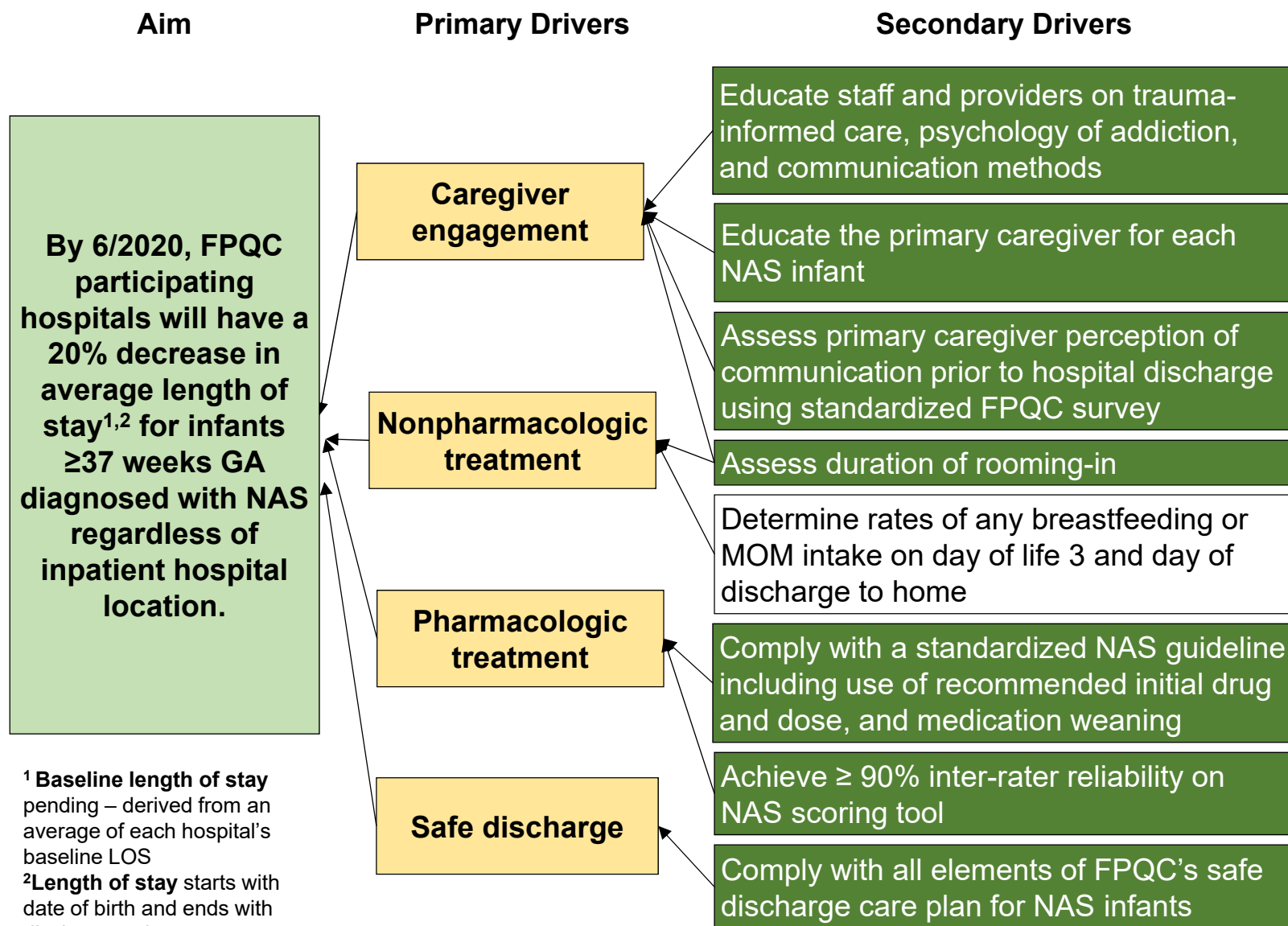
- 👤 Develop a data collection tool to place at bedside
- 👤 Have front desk “time-in” and “time-out”

NAS Project: Rooming-in Data Collection Tool

Record estimated number of hours each shift that parent, any family member or friend, or cuddler spent with baby.

Date							
7A-7P hours							
7P-7A hours							
Total hours							

Date							
7A-7P hours							
7P-7A hours							
Total hours							



Breastfeeding: evidence

- 👶 Breastfeeding initiation rates are less than the general population¹ and those that do breastfeed often stop in the first week of life²
- 👶 Staff must be aware of biases toward breastfeeding and ensure a neutral environment that is supportive of breastfeeding³
- 👶 Contraindications: positive maternal HIV status and cracked or bleeding nipples when maternal hepatitis C is positive⁴
- 👶 Academy of Breastfeeding Medicine criteria: maintaining sobriety during the prenatal period, no illicit drug use in the 90 days prior to delivery, intent to continue their treatment program into the postpartum period⁵

1. Balain M, Johnson K. Neonatal abstinence syndrome: the role of breastfeeding. *Infant* 2014;10:9-13
2. Wachman EM, Byun J, Philipp BL. Breastfeeding rates among mothers of infants with neonatal abstinence syndrome. *Breastfeed Med* 2010;5:159-64
3. Teague AH, Jnah AJ, Newberry D. Intraprofessional Excellence in Nursing: Collaborative Strategies for Neonatal Abstinence Syndrome. *Neonatal Netw* 2015;34:320-8
4. Cleveland LM. Breastfeeding Recommendations for Women Who Receive Medication-Assisted Treatment for Opioid Use Disorders: AWHONN Practice Brief Number 4. *J Obstet Gynecol Neonatal Nurs* 2016;45:574-6
5. Jansson LM, Committee AoBMP. ABM clinical protocol #21: Guidelines for breastfeeding and the drug-dependent woman. *Breastfeed Med* 2009;4:225-8

Breastfeeding: evidence

- The benefits of breastfeeding include improved mother-infant dyad, bonding, decreased symptom severity and reduced need for drug treatment, reduced treatment duration and reduced length of hospital stay¹⁻⁵
- Some studies suggest nonpharmacologic aspects of breastfeeding lessen NAS severity while others report no difference between breastfed infants and those fed expressed breast milk fed³
- MAT is NOT a contraindication to breastfeeding, as amounts of opiates in breast milk are small and have low bioavailability⁶

1. Wiles JR, Isemann B, Ward LP, Vinks AA, Akinbi H. Current management of neonatal abstinence syndrome secondary to intrauterine opioid exposure. J Pediatr 2014;165:440-6
2. McQueen KA, Murphy-Oikonen J, Gerlach K, Montelpare W. The impact of infant feeding method on neonatal abstinence scores of methadone-exposed infants. Adv Neonatal Care;11:282-90
3. Abdel-Latif ME, Pinner J, Clews S, Cooke F, Lui K, Oei J. Effects of breast milk on the severity and outcome of neonatal abstinence syndrome among infants of drug-dependent mothers. Pediatrics 2006;117:e1163-9
4. Jansson LM, Choo R, Velez ML, et al. Methadone maintenance and breastfeeding in the neonatal period. Pediatrics 2008;121:106-14
5. Grossman M, Seashore C, Holmes AV. Neonatal Abstinence Syndrome Management: A Review of Recent Evidence. Rev Recent Clin Trials 2017;12:226-32
6. Ryan G, Dooley J, Gerber Finn L, Kelly L. Nonpharmacological management of neonatal abstinence syndrome: a review of the literature. J Matern Fetal Neonatal Med 2018:1-6

Breastfeeding: recommendation/measure

Any MOM in 1st 3 DOL

- 👤 **Recommend MOM if not contraindicated**
- 👤 Breastfeeding is NOT contraindicated with methadone
- 👤 Follow your institution's policy regarding contraindications to MOM

Operational Definition	FPQC Goal
<p>Numerator: Total # of infants receiving any MOM (breastfeeding or EBM) within first 3 days of life</p> <p>Denominator: # of infants ≥ 37 0/7 weeks GA admitted anywhere in the hospital with a diagnosis of NAS</p> <p>Exclusion: MOM contraindicated, foster care placement, mother is incarcerated, adoption, mother in inpatient MAT, infant transferred \geq day of life 3</p>	$\geq 25\%$

Breastfeeding recommendation/measure

Any MOM at initial disposition

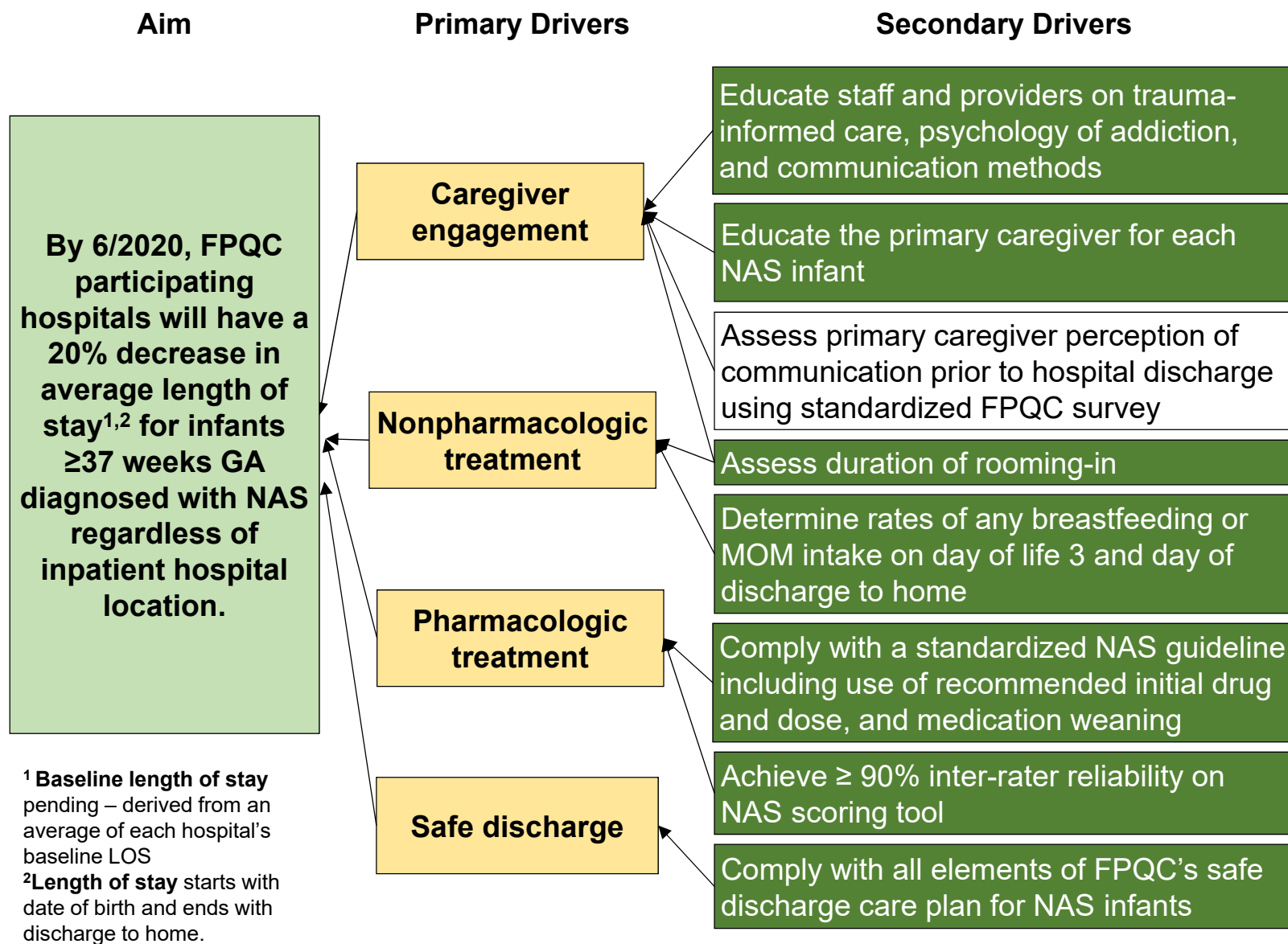
👤 Recommend supporting MOM throughout hospitalization

Operational Definition	FPQC Goal
<p>Numerator: Total # of infants receiving any MOM (breastfeeding or EBM) on day of initial disposition</p> <p>Denominator: # of infants $\geq 37\ 0/7$ weeks GA admitted anywhere in the hospital with a diagnosis of NAS</p> <p>Exclusion: Breastfeeding contraindicated, foster care placement, mother is incarcerated, adoption, mother in inpatient MAT or other (e.g. hospitalized for a medical reason)</p>	$\geq 15\%$

Tips on how to measure

- Use EHR to document and track feeds
- Work with lactation support to assure sufficient milk supply
- Involve mother:
 - To track direct breastfeeding times
 - To keep a feeding log / diary





Primary caregiver perception: evidence

- ❧ Disproportionately, women with substance use disorders report a history of traumatic events, mental health diagnosis, and intimate partner violence which may impact perceptions about judgement by staff in environments like a NICU.¹
- ❧ Substance exposure resulting in NAS symptoms may bring about feelings of shame, which can impact communication.¹
- ❧ Perception of positive communication with staff can promote feelings of self-efficacy regarding the mother's ability to care for herself and her infant.²
- ❧ In some studies, caregivers report increased assertiveness in medical encounters as a result of a perception of positive communication with health care providers.²

1. Krausz, M. *Addiction in Maternity: Mixed Methods Study on Substance Use During Maternity, Access to Services and Perceptions of Addiction in Maternity*. Vancouver: Centre for Health Evaluation and Outcome Sciences, 2010. <http://sheway.vcn.bc.ca/files/2012/07/Addiction-in-Maternity.pdf>
2. Moore, CD. Enhancing health care communication skills. *Home Health Care Services Quarterly* 2008; 27(1):21-35. doi: 10.1300/jo27v27n0102

Primary caregiver perception: recommendation/measure

- 👤 **Recommendation is to measure primary caregiver perception using a standardized survey**
- 👤 Cognitive testing completed via interviews (DACCO and PAT+)
- 👤 FPQC is first collaborative to utilize a caregiver survey
- 👤 Survey is completely anonymous – no PHI required
- 👤 Survey is voluntary – hospital or primary caregiver may opt out

Operational Definition	FPQC Goal
<p>Average of Likert scale response from primary caregiver for EACH survey question for all NAS infants at the time of initial disposition</p> <p>Exclusion: Foster care placement, mother is incarcerated, adoption, mother in inpatient MAT or hospitalized for a medical reason, transfer out of facility</p>	<p>Pending</p>

Primary Caregiver Survey

- 👤 5 point Likert Scale - answer of Agree (4) or Strongly Agree (5) desired
- 👤 Eight total questions taking < 5 minutes to complete
- 👤 Qualitative questions allow caregiver to provide information in their own words about positive and negative experiences during hospital stay
- 👤 Opportunity to see trends in perception about communication, encouragement and support, and mutual decision-making

- 👤 Will identify cases where DCF was called and gain insight re: caregiver perception about that communication

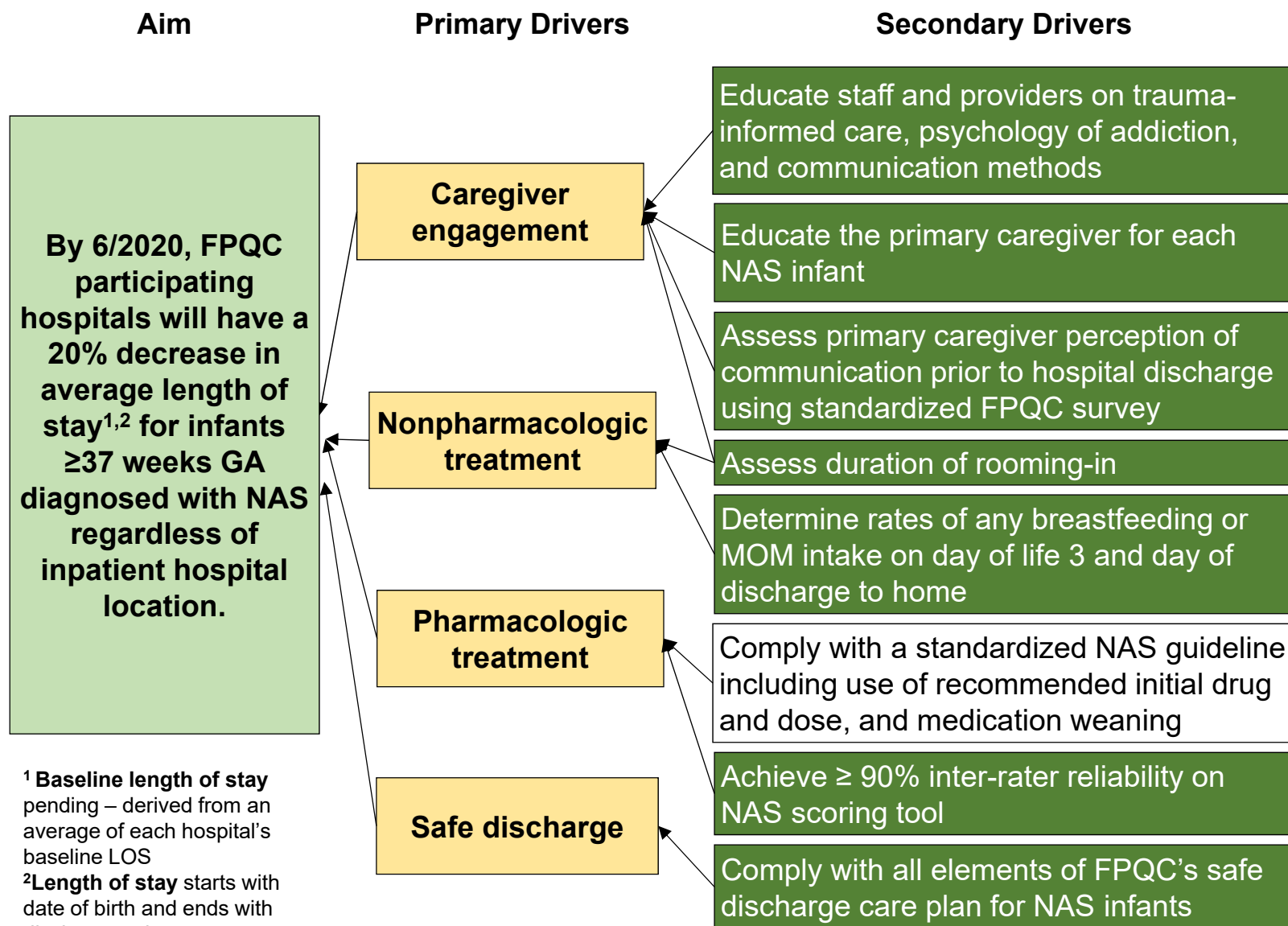
Q3 The NICU/hospital included me in my baby's care.

- ☐ Strongly Disagree (1)
- ☐ Disagree (2)
- ☐ Undecided (3)
- ☐ Agree (4)
- ☐ Strongly Agree (5)

Sample question

Tips on how to measure

- Administer survey close to discharge date to capture entire hospital experience
- Each hospital will be provided with a **unique link** to the electronic survey (Qualtrics)
- Suggest hospital staff open survey using hospital's unique link and direct parent to designated computer or tablet, etc. to complete survey
 - Designating individual(s) to own survey process may be helpful
 - Discourage sharing link with caregiver so multiple surveys are not completed by same caregiver.



Standardized guideline: evidence

- 👤 Have a protocol (s)
- 👤 Staff education and adhering to a protocol can reduce treatment time^{1,2}
- 👤 “Gold standard” primary and secondary medication to treat NAS infants has not been established
- 👤 Most common first line medications include: methadone, morphine, buprenorphine³
- 👤 Most common secondary medications include: clonidine and phenobarbital³
- 👤 Combination therapy may shorten in hospital treatment time⁴

1. Asti L, Magers JS, Keels E, Wispe J, McClead RE. A quality improvement project to reduce length of stay for neonatal abstinence syndrome. *Pediatrics* 2015;135:e1494-500.
2. Hall ES, Wexelblatt SL, Crowley M, et al. A multicenter cohort study of treatments and hospital outcomes in neonatal abstinence syndrome. *Pediatrics* 2014;134:e527-34.
3. Hudak ML, Tan RC, The Committee on Drugs and the Committee on the Fetus and Newborn, American Academy of Pediatrics. Neonatal drug withdrawal. *Pediatrics* 2012;129:e540-60.
4. Surran B, Visintainer P, Chamberlain S, et al. Efficacy of clonidine versus phenobarbital in reducing neonatal morphine sulfate therapy days for neonatal abstinence syndrome: A prospective randomized trial. *J Perinat* 2013;33(12):954-959.

Standardized guideline: evidence

- Consider having 2 separate protocols:
 - Capture protocol (initial treatment phase to reduce symptoms of NAS)
 - Weaning protocol (weaning off primary medications and when to add second and or third line medications)
- Consider different protocol for the difficult or recalcitrant NAS neonate¹
- Imperative to ensure NAS scoring and non-pharmacologic therapies are optimized to enhance patient weaning
- Physician NAS champions
- Standardize counting of days (e.g. morphine from 11/1-11/5)

1. Wiles JR, Isemann B, Ward LP, Vinks AA, Akinbi H. Current management of neonatal abstinence syndrome secondary to intrauterine opioid exposure. J Pediatr 2014;165:440-6.

Standardized guideline: recommendation/measure

Initiation of 1st line medication

- 🕒 **Recommend initiation of 1st line medication when threshold is met**
- 🕒 Treatment threshold and drug are defined by the individual institution

Operational Definition	FPQC Goal
Numerator: # of infants who were started on your institution's 1 st line medication when treatment threshold was met	≥ 80%
Denominator: # of infants ≥ 37 0/7 weeks GA admitted anywhere in the hospital with a diagnosis of NAS where the treatment threshold was met	
Exclusion: already started on medications prior to transfer	

Standardized guideline: recommendation/measure

Correct dose of 1st line medication

- 🕒 **Recommend initiation of 1st line medication when threshold is met at the **correct dose****
- 🕒 Treatment threshold, drug, and correct dose are defined by the individual institution

Operational Definition	FPQC Goal
Numerator: # of infants who were started on your institution's 1 st line medication at the correct dose	≥ 80%
Denominator: # of infants ≥ 37 0/7 weeks GA admitted anywhere in the hospital with a diagnosis of NAS and started on medication	
Exclusion: already started on medication prior to transfer	

Standardized guideline: recommendation/measure

1st line medication weaning

- 🕒 **Recommend weaning of 1st line medication from “capture” to medication discontinuation or initial disposition (whichever comes first) per YOUR guideline**
- 🕒 “Capture” = time from peak dose of medication to first wean
- 🕒 Weaning parameters are determined by individual institution
- 🕒 Must be compliant with EACH weaning opportunity

Operational Definition	FPQC Goal
Numerator: # of infants weaned per your institution’s guideline from “capture” to medication discontinuation or initial disposition (whichever comes first)	≥ 50%
Denominator: # of infants ≥ 37 0/7 weeks GA admitted anywhere in the hospital with a diagnosis of NAS and started on medication	
Exclusion: Initial disposition before weaning occurs	

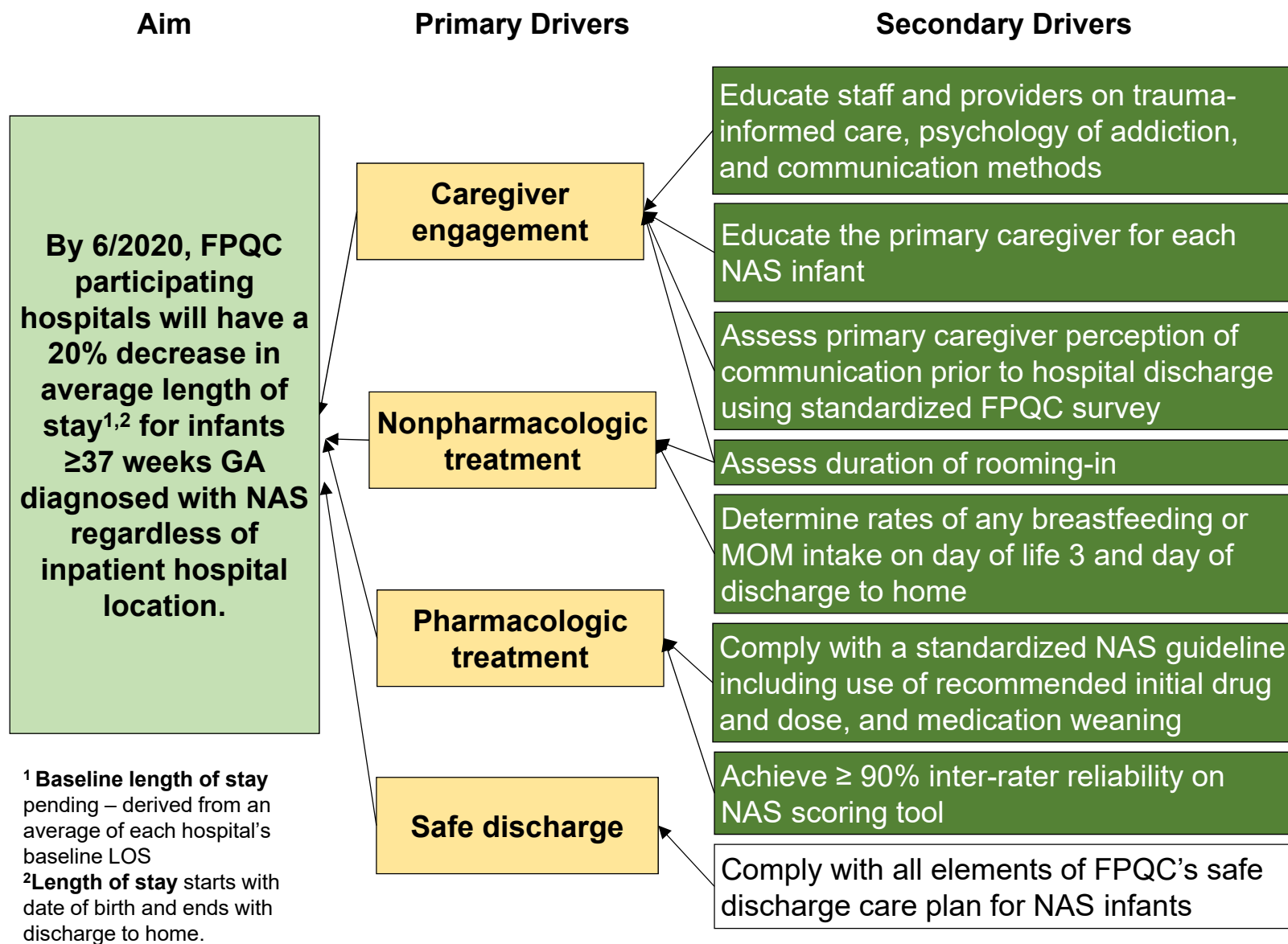
Tips on how to measure

- Correct drug at correct dose when threshold met is easy to obtain from EMR
- Use a “rounding tool” to capture weaning opportunities

Patient sticker

	Mon		Tues		Wed		Thurs		Fri		Sat		Sun	
Date (MM/DD/YY)														
Finnegan scores (min-max)														
Wean	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
If WEANED by	20%	25%	20%	25%	20%	25%	20%	25%	20%	25%	20%	25%	20%	25%
If NOT WEANED, why?														

A: Scores too high. **B:** Not gaining weight well. **C:** Physician discomfort. **D:** Nurse discomfort. **E:** Parent discomfort.



Safe discharge: evidence

- Healthcare providers involved in the delivery and care of substance affected infants are required to notify DCF (CAPTA, CARA)¹
- Monitor infants at risk for NAS for minimum of 4-7 days in hospital & determine minimum required monitoring period after discontinuation of pharmacological treatment²
- Provide parent with education and written list of community resources as rates of abuse, neglect, foster placement, and hospital readmissions are higher in NAS infants³



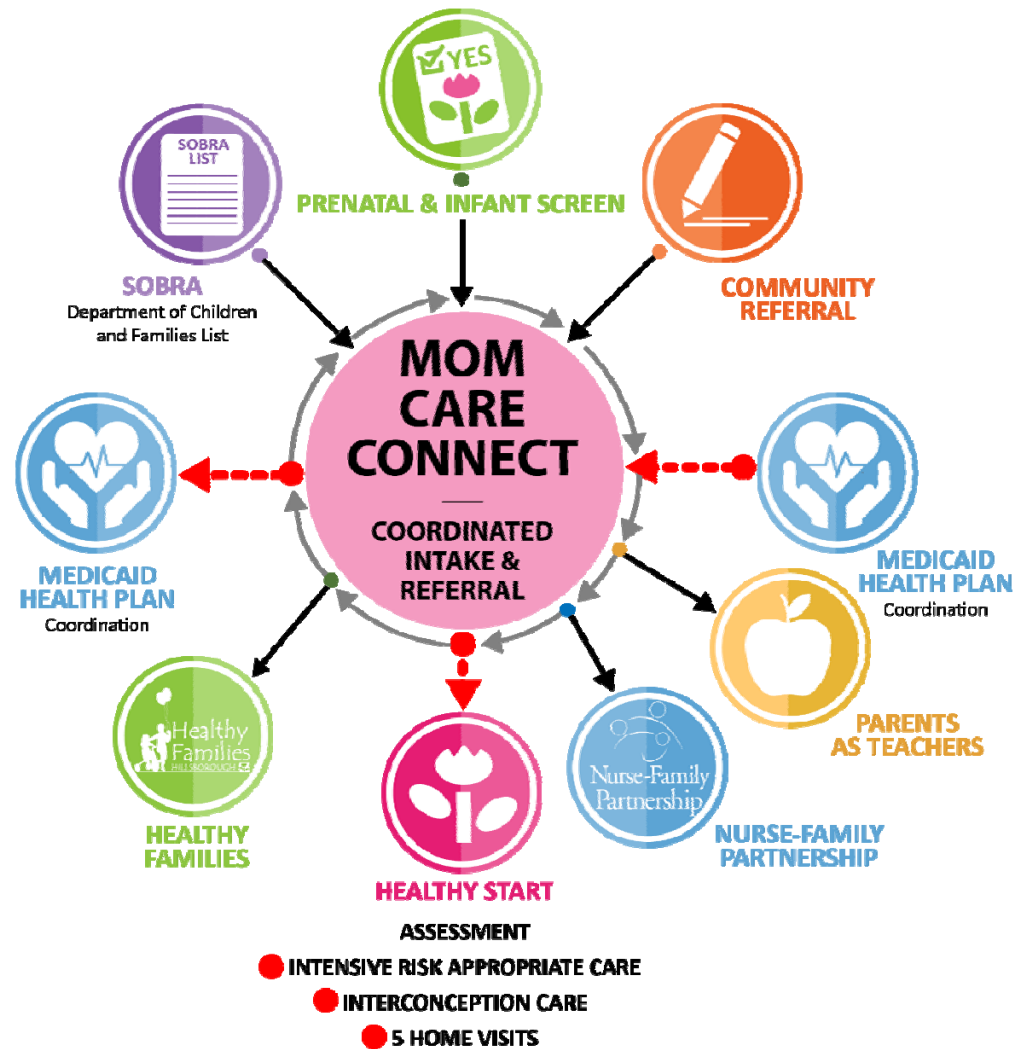
1. U.S. Department of Health and Human Services Administration for Children and Families. The Child Abuse Prevention and Treatment Act: Including the Justice for Victims of Trafficking Act of 2015 and the Comprehensive Addiction and Recovery Act of 2016. <https://www.acf.hhs.gov/sites/default/files/cb/capta2016.pdf2016>.
2. Hudak ML, Tan RC, The Committee on Drugs and the Committee on the Fetus and Newborn, American Academy of Pediatrics. Neonatal drug withdrawal. Pediatrics 2012;129:e540-60.
3. Patrick SW, Burke JF, Biel TJ, Auger KA, Goyal NK, Cooper WO. Risk of Hospital Readmission Among Infants With Neonatal Abstinence Syndrome. Hosp Pediatr 2015;5:513-9.

Safe discharge: evidence

- ➊ Referral to Early Steps to ensure close follow-up of growth, behavioral, and developmental problems is recommended for NAS infants¹⁻²
 - ➋ Developmental problems associated with opioid exposure include attention deficit disorders, disruptive behavior, and need for psychiatric referral³
- ➌ Referral Healthy Start Care Coordination⁴
- ➍ Ensure pediatric follow-up focusing on motor deficits, cognitive delays, behavioral concerns, school absence or failure, growth and nutritional benchmarks⁵

1. Wexelblatt SL, McAllister JM, Nathan AT, Hall ES. Opioid Neonatal Abstinence Syndrome: An Overview. Clin Pharmacol Ther 2017.
2. Hunt RW, Tzioumi D, Collins E, Jeffery HE. Adverse neurodevelopmental outcome of infants exposed to opiate in-utero. Early Hum Dev 2008;84:29-35.
3. Kraft WK, Stover MW, Davis JM. Neonatal abstinence syndrome: Pharmacologic strategies for the mother and infant. Semin Perinatol 2016;40:203-12.
4. Healthy Start Standards and Guidelines. Chapter 12: Substance Abusing Pregnant Women, Substance Exposed Children and Their Families. 2009. at <http://www.floridahealth.gov/programs-and-services/childrens-health/healthy-start/documents/final-chap-12.pdf>.)
5. Kocherlakota P. Neonatal abstinence syndrome. Pediatrics 2014;134:e547-61.

Safe discharge: evidence



Safe discharge: recommendation/measure

- 🕒 **Recommend all infants have a “safe” discharge defined by our Safe Discharge Bundle** which includes: 1) DCF report filed for infants with “confirmed” NAS; 2) discharge clearance determined; 3) Education on safe sleep, shaken baby syndrome, postpartum depression, NAS signs (measure #5); 4) Early steps referral made prior to hospital discharge; 5) Healthy Start referral; 6) Pediatrician appointment made within 3 business days of infant discharge

Operational Definition	FPQC Goal
<p>Numerator: # of infants with documentation of ALL elements of the Safe Discharge Bundle</p> <p>Denominator: # of infants $\geq 37\ 0/7$ weeks GA admitted anywhere in the hospital with a diagnosis of NAS</p> <p>Exclusion: initial disposition is transfer to another hospital</p> <p>*To be included in the numerator, must be compliant with ALL Safe Discharge bundle elements. Exception: foster care placement does not require safe sleep, shaken baby syndrome, and postpartum depression; non-biological mother placement does not require postpartum depression</p>	<p>$\geq 90\%$</p>

Tips on how to measure

- 🔄 Retrieve from various locations in EMR if information already exists
- 🔄 Incorporate into existing checklist
- 🔄 Develop checklist
- 🔄 Develop an EMR note template

