

DEVELOPMENT OF AN AIRWAY CHECKLIST FOR UHNBC EMERGENCY PHYSICIANS

► AIM STATEMENT

To have at least 80% of intubations performed at UHNBC by an Emergency Physician use an airway checklist by March 2022

► BACKGROUND

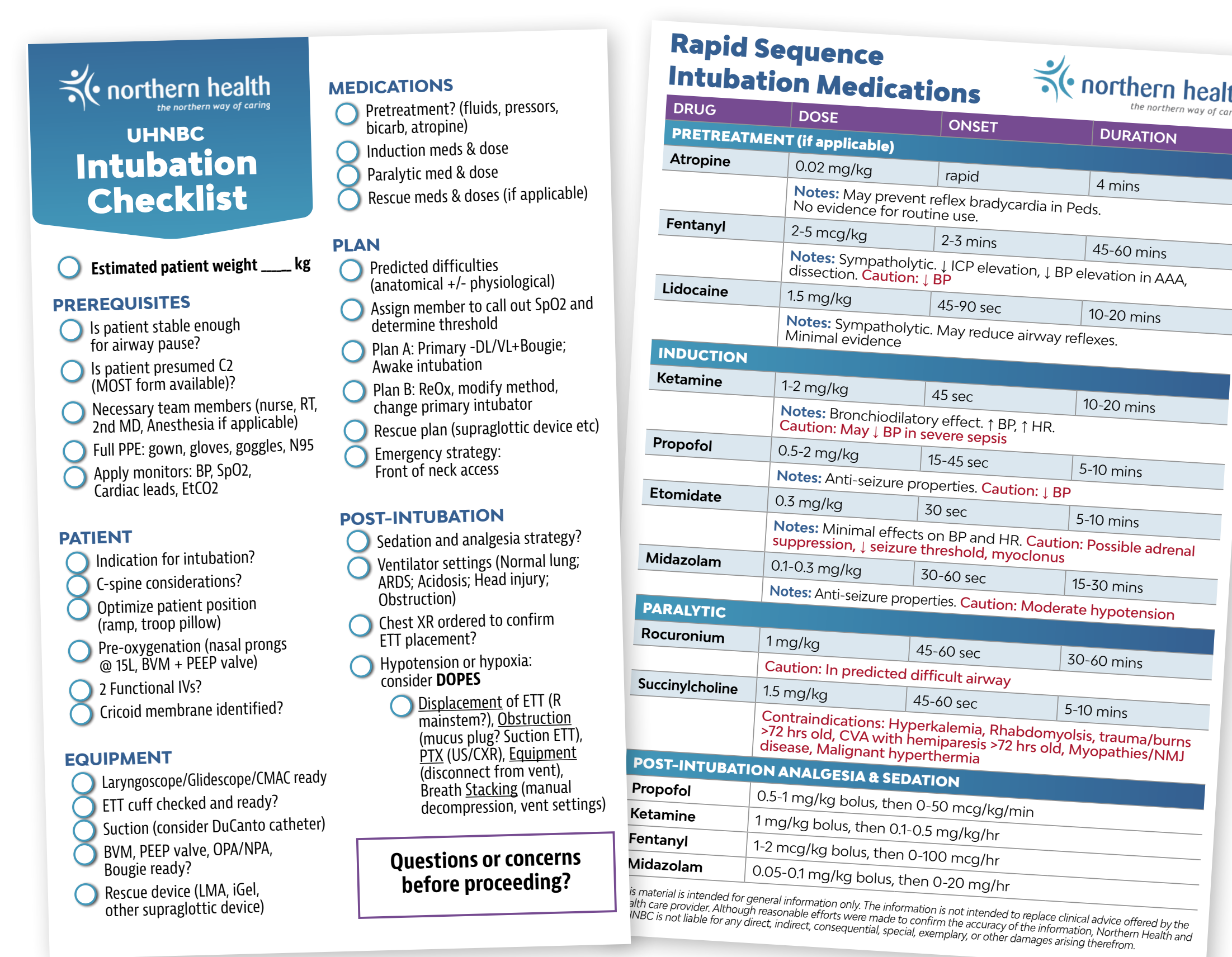
Patients that require ED intubation and mechanical ventilation pose numerous physiological and/or anatomical difficulties which create a significant threat of adverse events associated with this procedure. Moreover, this time sensitive procedure usually requires multiple members of the healthcare team (i.e. MD, nurses, RTs) necessitating effective communication and team dynamics to carry out successfully.

► PROBLEM STATEMENT

The current rate of adverse events; as well as perceived team dynamics and communication amongst staff surrounding ED intubations at UHNBC is not known. Currently, there is no standardized approach or safety check to performing intubations in the UHNBC ED.

► CHANGE IDEAS

- 1) Quantitative data analysis through chart reviews to determine a baseline for peri-intubation adverse patient events in the UHNBC ED
- 2) Qualitative data analysis through surveys to members of the ED team (MD, nurses and RTs) to determine barriers of effective communication and team dynamics surrounding intubations at UHNBC ED.
- 3) To create a UHNBC ED Airway Checklist as a safety check for future intubations performed by the Emergency Physician at UHNBC to improve patient adverse events and team communication.



UHNBC Intubation Checklist

Estimated patient weight ____ kg

PREREQUISITES

- Is patient stable enough for airway (patient)?
- Is patient presumed C2 (MDST form available)?
- Necessary team members (nurse, RT, 2nd MD, Anesthesia if applicable)
- Full PPE: gown, gloves, goggles, N95
- Apply monitors: BP, SpO2, Cardiac leads, ECG

PATIENT

- Indication for intubation?
- C-spine considerations?
- Optimize patient position (ramp, troop pillow)
- Pre-oxygenation (facial prongs @ 15L, BVM + PEEP valve)
- 2 Functional IVs?
- Cricoid membrane identified?

EQUIPMENT

- Laryngoscope/Glidescope/CMAC ready
- ETT cuff checked and ready?
- Suction (consider DuA/Catheter)
- BVM, PEEP valve, OPA/NPA, Bougie ready?
- Rescue device (LMA, iGel, other supraglottic device)

MEDICATIONS

- Pre-treatment (fluids, pressors, bicarb, atropine)
- Induction med & dose
- Paralytic med & dose
- Rescue med & doses (if applicable)

PLAN

- Predicted difficulties (anatomical + physiological)
- Assign member to call out SpO2 and determine threshold
- Plan A: Primary - DL/VT-Bougie; Awake intubation
- Plan B: RoCx, modify method, change primary intubator
- Rescue plan (supraglottic device etc)
- Emergency strategy: Front of neck access

POST-INTUBATION

- Sedation and analgesia strategy?
- Ventilator settings (Normal lung ARO2, ARO2, Head injury, Obstruction)
- Chest XR ordered to confirm ETT placement?
- Hypotension or hypoxia: consider DOPES
- Displacement of ETT (R mainstem?), Obstruction (mucus plug), Suction ETT, PTV (DOCA/DO), Equipment (disconnect from vent), Breath Stacking (manual decompression, vent settings)

Questions or concerns before proceeding?

Rapid Sequence Intubation Medications

DRUG	DOSE	ONSET	DURATION
PRETREATMENT (if applicable)			
Atropine	0.02 mg/kg	rapid	4 mins
Notes: May prevent reflex bradycardia in Peds. No evidence for routine use.			
Fentanyl	2-5 mcg/kg	2-3 mins	45-60 mins
Notes: Sympatholytic. ↑ ICP elevation, ↓ BP elevation in AAA. Caution: ↓ BP			
Lidocaine	1.5 mg/kg	45-90 sec	10-20 mins
Notes: Sympatholytic. May reduce airway reflexes. Minimal evidence.			
INDUCTION			
Ketamine	1-2 mg/kg	45 sec	10-20 mins
Notes: Bronchodilatory effect. ↑ BP 1 HR. Caution: May ↑ BP in severe sepsis			
Propofol	0.5-2 mg/kg	15-45 sec	5-10 mins
Notes: Anti-seizure properties. Caution: ↓ BP			
Etomidate	0.3 mg/kg	30 sec	5-10 mins
Notes: Minimal effects on BP and HR. Caution: Possible adrenal suppression, ↓ seizure threshold, myoclonus.			
Midazolam	0.1-0.3 mg/kg	30-60 sec	15-30 mins
Notes: Anti-seizure properties. Caution: Moderate hypotension			
PARALYTIC			
Rocuronium	1 mg/kg	45-60 sec	30-60 mins
Caution: In predicted difficult airway			
Succinylcholine	1.5 mg/kg	45-60 sec	5-10 mins
Contraindications: Hyperkalemia, Rhabdomyolysis, trauma/burns >72 hrs old, CVA with hemiparesis >72 hrs old, Myopathies (MD)			
POST-INTUBATION ANALGESIA & SEDATION			
Propofol	0.5-1 mg/kg bolus, then 0.5-0.5 mcg/kg/min		
Fentanyl	1 mg/kg bolus, then 0.1-0.5 mcg/kg/hr		
Ketamine	1.2 mg/kg bolus, then 0-20 mcg/kg/hr		
Midazolam	0.05-0.1 mg/kg bolus, then 0-20 mcg/hr		

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► RESULTS

Pooled Survey results from UHNBC ED

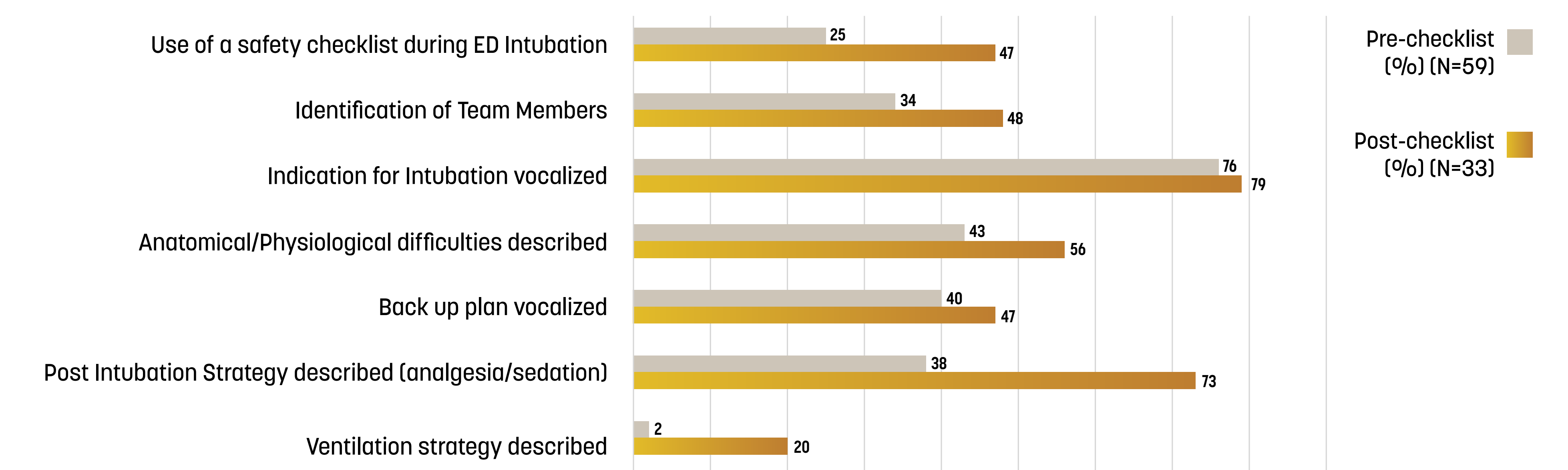


Chart review performed between June 24, 2020 - June 26, 2021 encompassing 39 charts meeting criteria revealed an adverse event rate of **40% for Hypotension, 8% for Hypoxia, and 6-9% for multiple attempts around ED intubations** by an Emergency Physician prior to checklist implementation.

Survey results collected from ED staff. Following results are as pooled Median Percentage

- **85%** of Nurses & **67%** of MDs surveyed say The UHNBC Airway Checklist has improved team communication.
- **100%** of Nurses & **83%** of MDs surveyed say The UHNBC Airway Checklist has improved perceived patient outcomes.
- **100%** of Nurses & MDs surveyed say they would promote the ongoing use of The Airway Checklist.

► NEXT STEPS

A UHNBC Airway Checklist and a point-of-care reference card for Emergency Physicians has been developed and implemented in the ED. The project team will perform a secondary data analysis through chart reviews and ED member surveys at 6 months post implementation to determine change in our baseline data points.

► SUSTAINING THE GAINS

- Regular email communication to ED physicians, nurses, and RTs outlining the rollout of the Airway checklist
- Project background and data analysis presented at UHNBC ER Grand Rounds after implementation
- In-situ training carried out in the ED for members to participate in a high fidelity trauma simulation implementing the Airway Checklist

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TEAM MEMBERS: Dr. Herman Johal, ED Physician - Team Lead, Dr. Rebecca Reid, FM Resident - Chart review, data analysis, Julia Veiq, NMP Medical student - Chart review, data analysis, Jennifer Day, ED Pharmacist - Review of pharmacology associated with the pocket card, Shelley Movold, PQI Team - assistance with data presentation, Simon Zukowski, Evaluation Analyst - distribution and analysis of qualitative data through staff surveys