Promoting a safe extubation in critical care
Increasing staff confidence levels on extubation

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Background

Patients within the critical care setting, particularly those intubated, have an increased risk of airway and respiratory complications due to prolonged time on sedatives and paralysing agents. These complications are three times more common during extubation than intubation, where the use of checklists and clear communication have been suggested as strategies to minimise these risks (Foulds, L.., *et. al,* 2018).
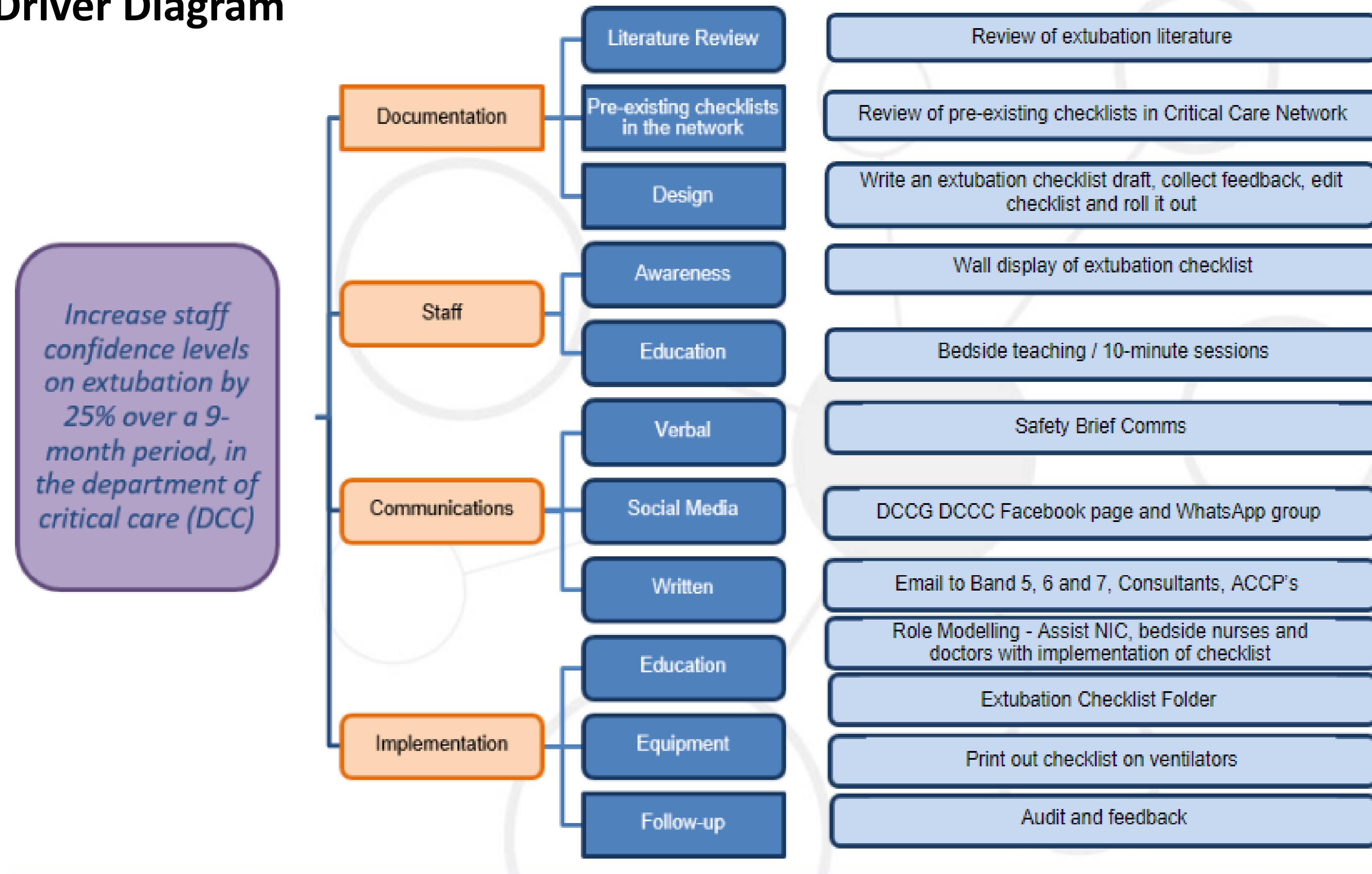
Our baseline data has shown that 15% of extubations led to reintubation within 72 hours, and 20% of staff felt there was no clear plan for extubation. Also, 63% had experienced an unplanned or poorly planned extubation. Failed extubations that are higher than 5-10% are likely to lead to unnecessary prolonged intubation of critically unwell patients (Nickson, C., 2024).

The high acuity of our critical care unit, junior and rotational workforce (where only 39% of DCC nurses had their critical care course) and lack of standardised extubation procedure at the time, have contributed to the reduced confidence levels found in the initial staff survey (where only 27% of nurses felt completely confident with extubation). Furthermore, 84% of our staff expressed they would benefit from an extubation checklist.

Aim

In response to that, our aim was to <u>increase staff confidence levels on extubation in DCC by 25% over a 9-month period (Jan 24 – Sep 24).</u> This included the distribution of a staff questionnaire (before, during and post intervention), the design and implementation of an extubation checklist, collection of feedback, education on the new tool and monthly compliance reports to achieve a minimal of 70% staff compliance throughout this project.

Driver Diagram

Increase staff confidence levels on extubation by 25% over a 9-month period, in the department of critical care (DCC)

- **Documentation**
  - Literature Review — Review of extubation literature
  - Pre-existing checklists in the network — Review of pre-existing checklists in Critical Care Network
  - Design — Write an extubation checklist draft, collect feedback, edit checklist and roll it out
- **Staff**
  - Awareness — Wall display of extubation checklist
  - Education — Bedside teaching / 10-minute sessions
- **Communications**
  - Verbal — Safety Brief Comms
  - Social Media — DCCG DCCC Facebook page and WhatsApp group
  - Written — Email to Band 5, 6 and 7, Consultants, ACCP's
- **Implementation**
  - Education — Role Modelling - Assist NIC, bedside nurses and doctors with implementation of checklist / Extubation Checklist Folder
  - Equipment — Print out checklist on ventilators
  - Follow-up — Audit and feedback

Fig. 1 – Extubation Checklist designed and implemented in DCC

## PDSA Cycles

PDSA Cycle 1
- Design an extubation checklist for DCC, aligning with local safety standards for invasive procedures' format.
- Collect feedback and amend it accordingly to go live in Jan 24
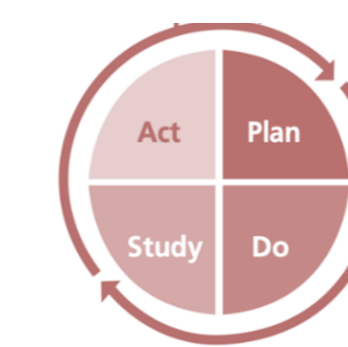
PDSA Cycle 2
- Update checklist following feedback from staff (add date, time and staff involved to ensure accuracy and assist with compliance)
- Continue monthly audits of the checklist compliance
- Staff confidence levels re-assessed with 'mid-point' questionnaire (May 24)
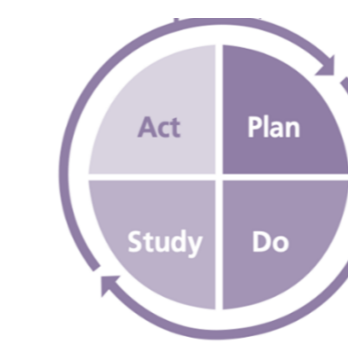
PDSA Cycle 3
- Visual reminder added to ventilators to maintain checklist compliance >70%
- Staff updated via emails with monthly compliance reports; encouraged bedside/tea trolley teaching
- Staff confidence levels re-assessed with final questionnaire (Sep 24)

Outcome Measure
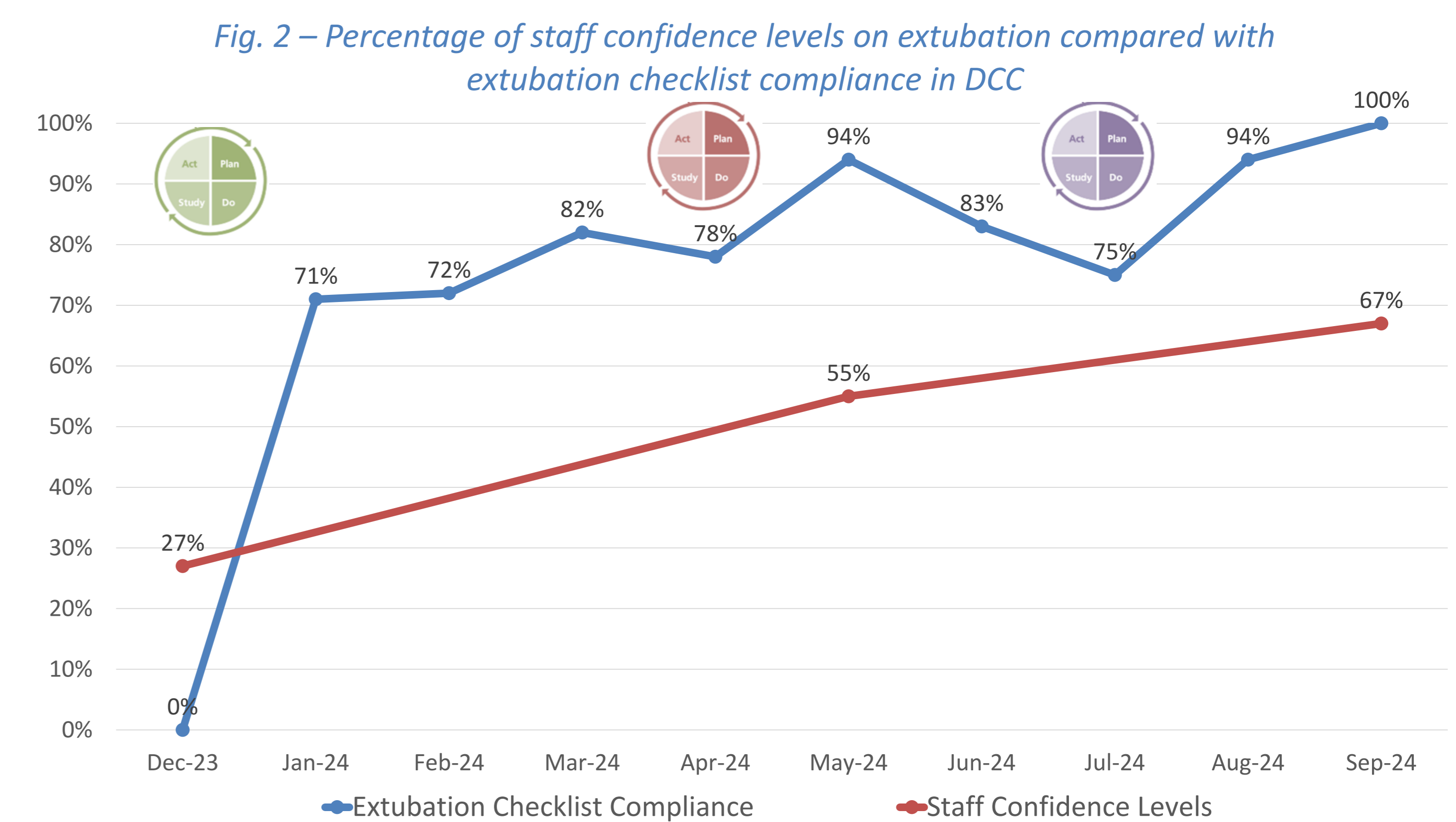- Distribute a questionnaire to assess staff confidence levels on the extubation process (Dec 23, May 24 and Sep 24)

Process Measures
- Design an extubation checklist to comply with safety guidelines for invasive procedures
- Educate 60% of staff through tea-trolley sessions, bedside teaching and attendance to departmental meetings
- Audit the extubation checklist compliance (monthly) and maintain a minimum of 70% compliance on its full completion

Balancing Measures
- Measure the number of failed extubations
- Measure the number of intubated days
- Measure the length of stay (in days) in DCC

Data and Results

Fig. 2 – Percentage of staff confidence levels on extubation compared with extubation checklist compliance in DCC

Extubation Checklist Compliance: Dec-23 0%, Jan-24 71%, Feb-24 72%, Mar-24 82%, Apr-24 78%, May-24 94%, Jun-24 83%, Jul-24 75%, Aug-24 94%, Sep-24 100%
Staff Confidence Levels: Dec-23 27%, May-24 55%, Sep-24 67%

— Extubation Checklist Compliance   — Staff Confidence Levels

- Total of **40% increase in staff confidence levels** on extubation in critical care
- **More than 70% checklist compliance** achieved throughout our project (71%-100%)
- There was a **15% reduction in the number of failed extubations**
- There was **no change to the average of days (three)** a patient remained **intubated** for
- **Slight reduction in the length of DCC stay** from 7 to 5 days since the extubation checklist was implemented

Variable critical care acuity levels and patients' multiple comorbidities might have affected our percentage of failed extubations, length of intubation and length of DCC stay. All of which were taken into consideration when analysing and interpreting our results.

Next Steps
- Run a snap-shot audit at 12 months (Jan 2025) to assess staff confidence levels, checklist compliance, percentage of failed extubations, length of intubation and length of DCC stay
- Have the extubation checklist agreed and embedded in the Trust's documentation and facilitate the journey to a digital future by having it added to Sunrise: EPR
- Facilitate further quality improvement projects within the unit: CCPOT (pain assessment) and nursing lead respiratory weaning for ventilated patients