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Appropriate ECMO Screening Protocols for Critically Ill Patients During COVID-19

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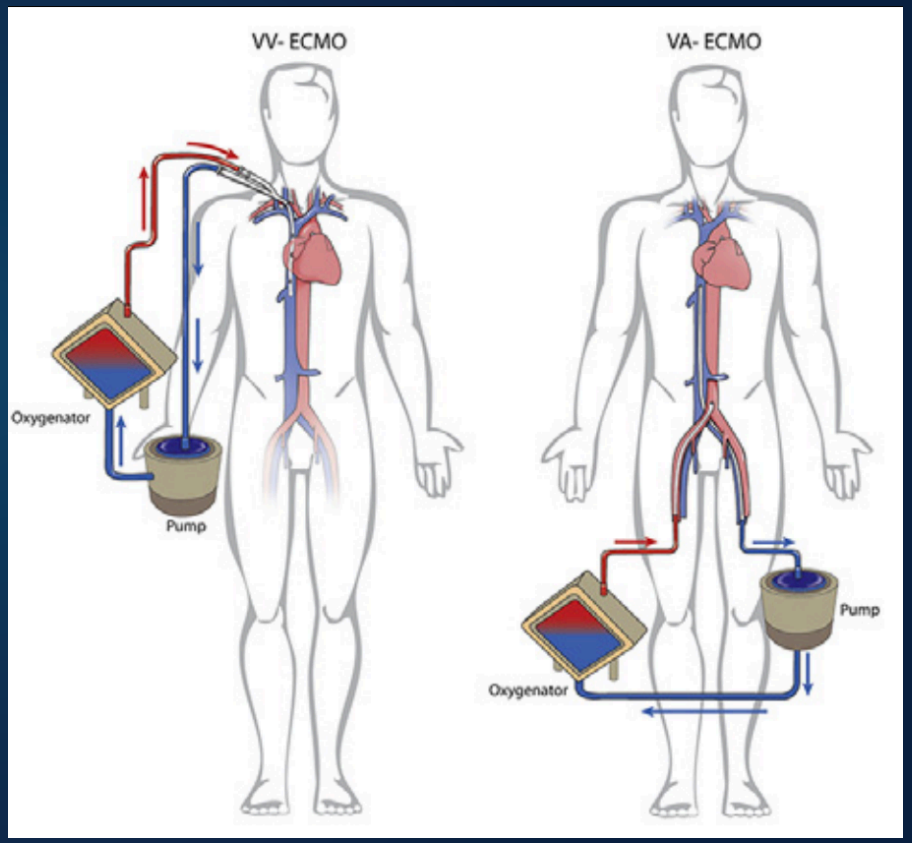
What is ECMO?

- An intervention that provides intense cardiopulmonary support
- Advantages of use in COVID-19 patients
  - Direct pulmonary artery flow improves oxygenation and ventilation
  - Early mobility after removal
  - Minimal cannula-associated complications or revisions
  - Support of right side of heart in case of right ventricular dysfunction



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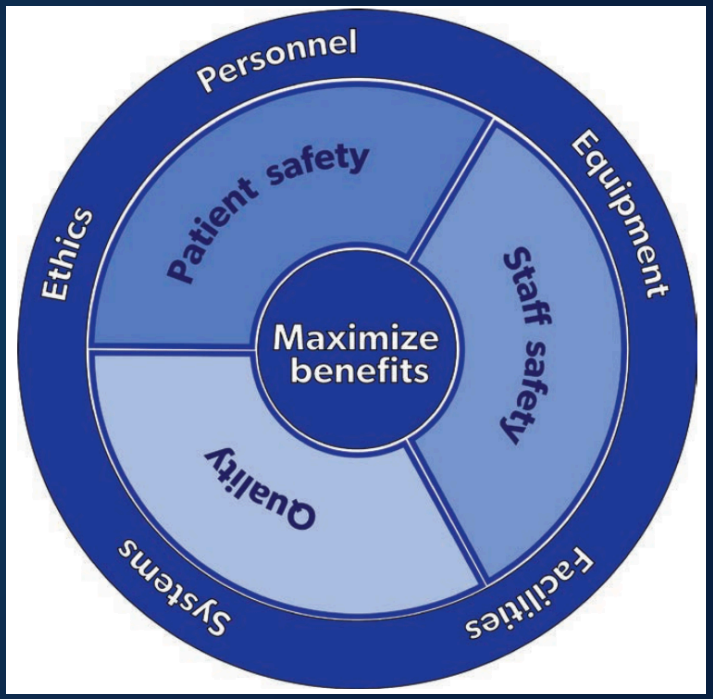
ECMO Throughout the COVID-19 Pandemic

- Early data suggested a possible mortality rate >90%
- Currently 3,041 COVID-19 confirmed patients have been treated with ECMO
- Independent risk factors
  - Age, immunocompromised state, chronic respiratory disease, pre-ECMO cardiac arrest, degree of hypoxemia
- 3 categories for guidelines
  - Recommended: technique/intervention is beneficial
  - Not recommended: technique/intervention is not beneficial or harmful
  - Consider: possibly beneficial or use caution when utilizing



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Objectives

- Research Question
  - Are the correct criteria being implemented for the screening of ECMO patients based on resources during COVID-19?
- Hypothesis
  - An increase in accepted COVID-19 ECMO referrals via changes to screening protocols allows for increased treatment and improved outcomes.
- Objectives
  - Evaluate screening criteria for ECMO patients during COVID-19
  - Determine if there is fair evaluation of the medically ill without bias
  - Potential liberalization of screening criteria

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Approach

- Population: ECMO referrals between March-October 2020
- Outcomes
  - Accepted or decline referral
  - Patient disposition
  - Survival length
- Contacting the referring physician
  - Inquire about patient status before referral
  - Process of referring patients
  - Possible referral to another hospital if declined
- Analysis of accepted and declined patients within established window
  - Survival or death
  - Hospitalization duration and ECMO treatment duration
  - Reason for declination

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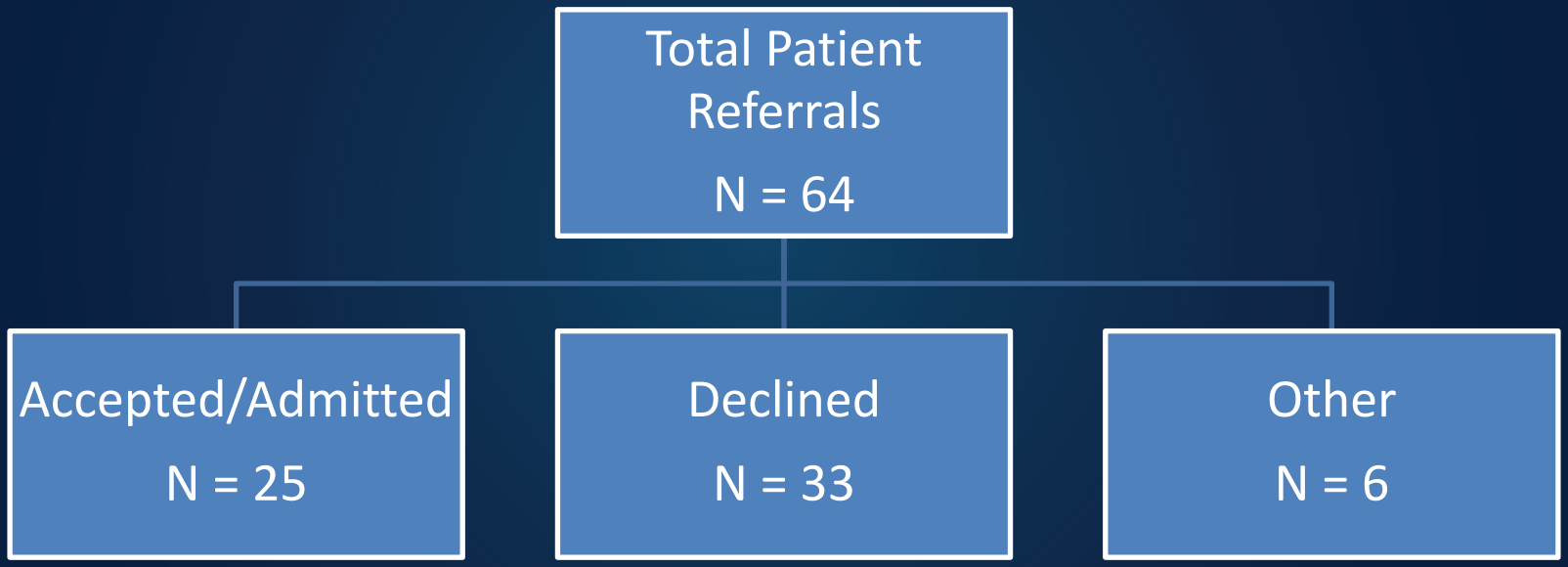
Results

Figure 1. Overall Patient Classification



- 64 total patient referrals between March 2020 and October 2020

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Results

Table 1. Mortality of Classified Patients within 30 days

Patient Classification	Alive <30 days	Deceased <30 days	Deceased >30 days
Accepted	13	11	1
Declined	10	23	0

- Further separation of patient population allows for identification of possible missed patients
- Severe organ dysfunction, underlying co-morbidities, and previous mechanical ventilation limited acceptable patients

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Results

- 9 of the surviving patient group were discharged in fair-good disposition
- Majority of admitted patients were placed on VV-ECMO (63%)
- Mean age
  - Declined patients = 47
  - Accepted patients = 56
- Strongest predictors of mortality
  - Age, chronic respiratory disease, VA-ECMO use, ECMO duration, acute kidney injury

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Conclusions

- ECMO is a useful intervention for increasing the survival rate of COVID-19 patients
  - Reserved for refractory cases of respiratory distress
- Current post-ECMO patient outcomes match the national average
- Expansion of criteria to allow earlier ECMO implementation can improve patient mortality
- Continued use of ECMO for accepted patients will decrease mortality of ARDS due to COVID-19
- A major limitation was the collection of information on declined patients

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Future Directions

- Long-term outcomes of patients surviving ECMO support
  - Related to age, ECMO duration, initial disposition
- Racial disparities and equitable selection of ECMO patients
- Use of ECMO earlier in treatment course for patients with COVID-19

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