

7TH EUROPEAN CONFERENCE ON
Weaning and Rehabilitation in Critically ill Patients

MOVE AS ONE TEAM



9th and 10th of November



Amsterdam, Netherlands

Program & Abstracts



#ICURecovery19

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WELCOME

Dear Colleagues,

With great pleasure we like to welcome you to the **7th European Conference on Weaning and Rehabilitation in Critically Ill Patients** in Amsterdam, The Netherlands from 8 to 10 November 2019. This annual conference focuses on the interdisciplinary approach to weaning and rehabilitation of critically ill patients *during* and *after* admission to the Intensive Care Unit. The annual conference is an exciting forum to network and share advances and experiences in clinical practice around the management of this patient group. The 2019 conference has the motto “MOVE AS A TEAM” and includes updates on current evidence and meet the expert sessions on this theme from the perspective of different disciplines as well from former patients.

The Amsterdam Conference is the seventh meeting of its kind, following previous conferences in Leuven (2018), London (2017), Hamburg (2016), Copenhagen (2015), Athens (2014), and Vienna (2013). As the conference establishes its place on the European meeting calendar, we have maintained the emphasis of the meeting on interprofessional discussion and learning, rather than solely focus on scientific output.

The two-day programme includes invited lectures from our international Faculty. In addition, 6 abstracts will be presented in spoken sessions, 7 best practice videos on ICU Teamwork will be showed and over 40 posters and videos will be exhibited throughout the course of the conference. Again, we have a large delegate audience from many different professional backgrounds which provides great opportunities to network and engage with interprofessional ICU teams from all parts of the world.

Welcome to Amsterdam! The capital of the Netherlands. With its universities, academies, and research institutes, along with numerous entertainment venues, Amsterdam is the country's leading cultural center. It is a great pleasure to welcome you to the Amsterdam University Medical Centers (location AMC), which is established in 2018 from the collaboration between the two university hospitals in Amsterdam.

We thank you for joining us in making the *7th European Conference on Weaning & Rehabilitation in Critically Ill Patients* a successful, interesting and memorable conference.

Sincerely

Team Amsterdam

Leo Heunks | Frederique Paulus | Marike van der Schaaf | Juultje Sommers | Peter Spronk

TEAM AMSTERDAM - Alphabetically



Leo Heunks - MD, PhD

Pulmonologist-intensivist & professor of experimental intensive care, Amsterdam UMC.
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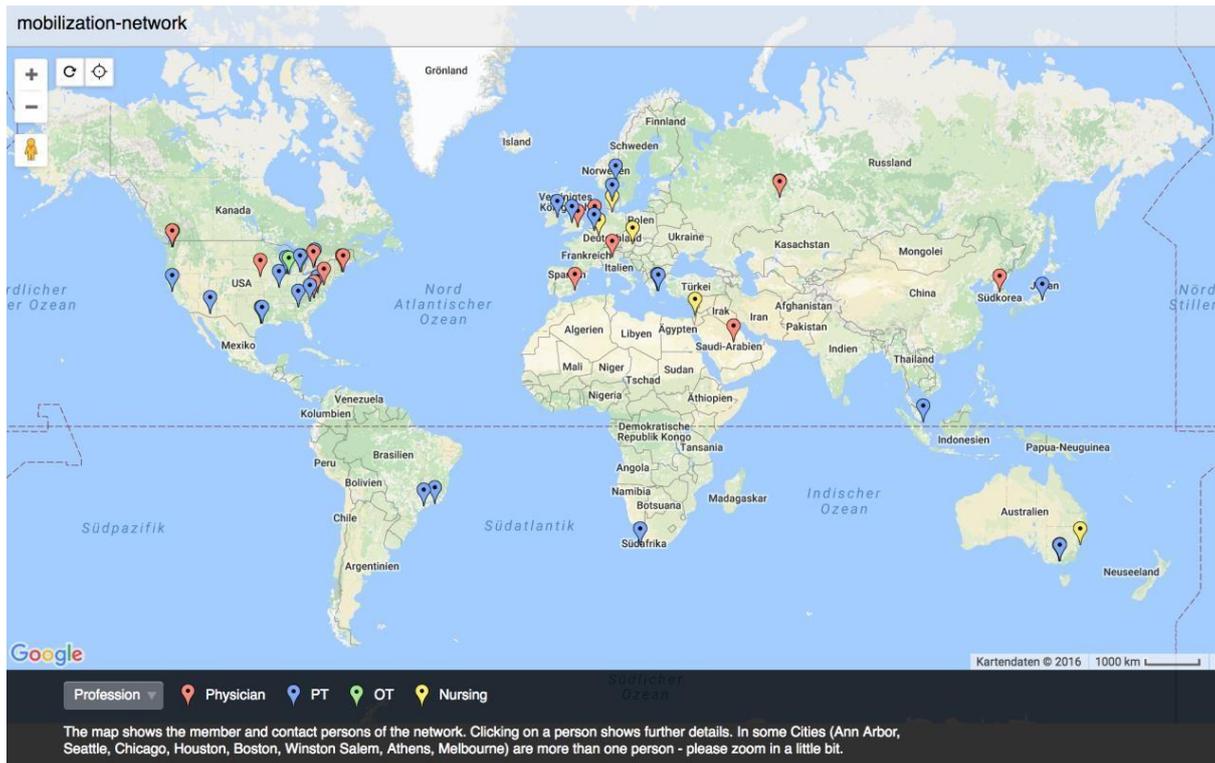


Peter Spronk - MD, PhD, EDIC

Internist-intensivist at Gelre Hospitals, Apeldoorn, The Netherlands, director of ExplIRA - Expertise Center for Intensive care Rehabilitation Apeldoorn.
Expertise: coordination of care for patients with prolonged ICU stay, quality of life, early mobility, nutrition, dysphagia, longterm outcome.
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ICU RECOVERY NETWORK

Welcome to ICU Recovery Network, the international network for early mobilization and rehabilitation of critical care patients. The ICU Recovery network is an international, multidisciplinary and multiprofessional organization with more than 1,000 members representing all five continents. It was founded in 2011. Participation is for free, but exclusively to clinicians. ICU Recovery Network includes sub-networks, located in several countries. To date, there are sub-networks in Chile, Denmark, Germany, Greece, Japan, and Korea. The website of the network is www.mobilization-network.org.



If you want to join the network, please email the local representative in your region of the world or just email with your affiliation to Peter Nydahl: peter@nydahl.de. You will receive an invitation to join ICU Recovery Network, which is located on a server from MedConcert. Chair of the network is Professor Dale Needham, MD PhD, Baltimore, USA He emails a newsletter once per month to all participants of ICU Recovery Network, including details of new publications, resources, conferences and other information.

EUROPEAN BOARD - Alphabetically



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VENUE AND TRAVEL INFORMATION



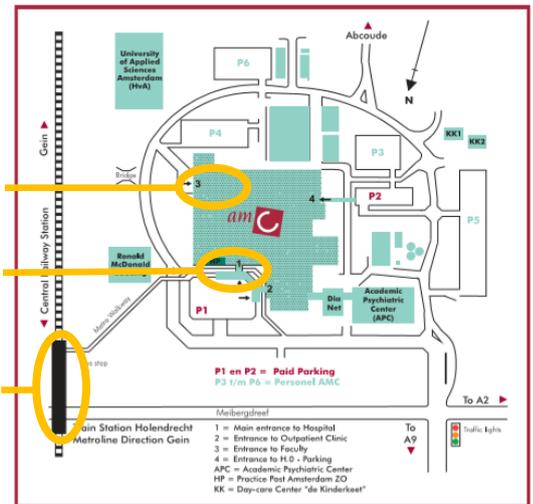
Route description Amsterdam UMC, loc. AMC



Conference location – J-wing

Main entrance

Train & metro station
Holendrecht



Address

Amsterdam UMC, loc. AMC
Meibergdreef 9
1105 AZ Amsterdam Zuidoost

Note: The conference takes place in the J-wing (in the direction of Museum Vrolik) which should be accessed via the MAIN ENTRANCE.

HOW TO REACH AMSTERDAM UMC, LOC. AMC BY PUBLIC TRANSPORT

Metro:

Disembark at metro terminal "Holendrecht":

- Metro # 54 when taking the metro from Amsterdam Central Station (via terminals Amstel and Bijlmer Arena) bound for Gein;
- Metro #50 when taking the metro from Isolatorweg (via terminals Sloterdijk, Zuid, RAI and Bijlmer Arena) bound for Gein.

From the metro terminal "Holendrecht" it is a 5-minute walk tot he main entrance of the Amsterdam UMC, loc. AMC

Train:

Disembark at NS train station Holendrecht.

From the train station it is a 5-minute walk to the main entrance of the Amsterdam UMC, loc. AMC

HOW TO REACH AMSTERDAM UMC, LOC. AMC BY CAR

Navigate to the address:

Meibergdreef 9

1105 AZ Amsterdam Zuidoost

Parking

The parking areas around Amsterdam UMC, location AMC are numbered.

You may park your car at P1 (paid), P2 (paid) and P6 (free of charge)

On P1 and P2 parking is charged at a basic rate of €3 for the first three hours. The parking rate after that is € 0,50 per half hour. Please take your parking ticket with you as you leave your car. Ticket machines are situated at the various exits.

WELCOME TO AMSTERDAM

Amsterdam is the capital of the Netherlands. With more than one million inhabitants in its urban area (and almost two and a half million inhabitants in its metropolitan area), it is the country's largest city and its financial, cultural, and creative centre.

Amsterdam derives its name from the city's origin as "Dam" of river "Amstel". In the past, the name was "Amstelredamme" which later changed as "Amsterdam".

Each area of Amsterdam has its own character and charm, and a unique variety of shops, restaurants, cafes, museums and attractions. Take time to discover the city's hidden treasures in Amsterdam's neighborhoods. The city of Amsterdam prides itself on a rich cultural life and a diverse population.

Venice of the north

Amsterdam is colloquially known as Venice of the North because of its lovely canals that criss-cross the city, its impressive architecture and more than 1.500 bridges. There is something for every traveller's taste here; whether you prefer culture and history, serious partying, or just the relaxing charm of an old European city.

Weather in Amsterdam

The weather continues to get colder and wet in November in Amsterdam. Temperatures are likely to be around 10°C. It is advisable to bring warm clothes and an umbrella or a raincoat.



GENERAL INFORMATION A-Z

Registration

Please register upon arrival.

Registration desk opening hours

- Saturday 9th November 08.00 – 18.00 hrs
- Sunday 10th November 08.30 – 16.00 hrs

Upon registration you will receive your name badge, a notebook and pen along with the program of the conference.

Name badge

You will receive your name badge at the registration desk. Please wear your name badge at all times during the conference for access to all areas as well as food and beverages. Please be aware that your name badge has to be scanned on Sunday in order to receive a certificate of attendance for both days.

Certificate of attendance

You will receive a certificate of attendance afterwards via e-mail.

For Dutch participants only:

Accreditatie toegekend door

- Koninklijk Nederlands Genootschap voor Fysiotherapie (KNGF), register Kwaliteitsdeel - 11 punten
- Accreditatiebureau Kwaliteitsregister V&V en Register Zorgprofessionals - 11 punten
- NVIC – Nederlandse Vereniging voor Intensive Care - 11 punten
- NIV – Nederlandse Internisten Vereniging - 11 punten
- NVALT – Nederlandse Vereniging van Artsen voor Longziekten en Tuberculose - 11 punten
- NVA – Nederlandse Vereniging voor Anesthesiologie - 11 punten
- NVVC – Nederlandse Vereniging voor Cardiologie - 11 punten
- NVvH – Nederlandse Vereniging voor Heelkunde - 11 punten
- NVvN – Nederlandse Vereniging voor Neurochirurgie - 11 punten
- NVN – Nederlandse Vereniging voor Neurologie - 11 punten

Accreditatie is aangevraagd bij:

- VRA – Nederlandse Vereniging van Revalidatieartsen

Official language

The official language of the conference is English.

WiFi

You can use the free wifi at the conference venue.

Network: PUBLIC | No password required

Food and beverages

Refreshments, a sandwich packed lunch and drinks on Saturday are included in the conference registration. Please do not take food into the lecture theatres.

Currency

All vendors and venues in Amsterdam accept cash and most major credit cards. The used currency in the Netherlands is Euro (€).

Liability and insurance

The organizer assumes no liability for personal injury or loss of or damage to private property. Please remember to take out a private travel and health insurance.

Mobile phones

Please ensure mobile phones are turned off or muted during presentations.

Smoking policy

Smoking is prohibited in all internal and external areas of the venue.

Water

The tap water is safe to drink.

Wardrobe

Use of the wardrobe is at your own risk. The organization is not held responsible for loss of damages of your property.

Welcome drinks | Friday 8th November | 18.00 - 19.00 hrs

Join us, on Friday evening November 8th, for some drinks and Dutch snacks in café In de Waag from 18.00 - 19.00 hrs. Please note that pre-registration is mandatory and it is **not** possible to purchase a ticket on site.

The costs are € 7,50 per person and include drinks and some snacks between 18.00 – 19.00 hrs.

Address:

Café In de Waag

Nieuwmarkt 4

1012 CR Amsterdam

Conference diner | Saturday 9th November | 19.00 - 22.00 hrs

On Saturday evening, November 9th, we invite our conference delegates to attend the conference dinner. Please note that pre-registration is mandatory and it is **not** possible to purchase a ticket on site.

The costs are € 50,00 per person and includes food and drinks. The dinner location, "Tolhuistuin", is located in the city center of Amsterdam only a 3-minute, free, ferry ride from Amsterdam Central Station.

Bus transport is arranged from the conference to the dinner location. Please meet us at the registration desk by 18.15 hrs. Dinner ends at 22.00 hrs and a bus will bring you back to the conference venue or, if you stay in Amsterdam city center, you can go back to your hotel on your own.

Address:

Tolhuistuin

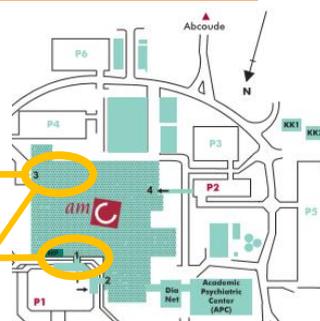
IJpromenade 2

1031 KT Amsterdam

FLOOR PLAN

Conference location – J-wing

Main entrance



PROGRAM

FRIDAY NOVEMBER 8TH

18.00 - 19.00 Welcome drinks – Café In de Waag (separate registration required)

SATURDAY NOVEMBER 9TH

08.15 - 09.00 Registration

09.00 – 10.30

Collegezaal 1

THE PATIENT; ACUTE PHASE

Chairs: Alexander Demoule & Rik Gosselink

09.00 - 09.15

Welcome

Marieke van der Schaaf (The Netherlands)

09.15 - 09.30

O01

Lessons from a patient journey

Marianne Brackel (The Netherlands)

09.30 - 10.00

O02

ICU-acquired weakness; current perspectives

Janneke Horn (The Netherlands)

10.00 - 10.30

O03

Interdisciplinary care to optimize weaning: move as a team

Alexandre Demoule (France)

10.30 - 11.00

Coffee break

11.00- 12.15

Collegezaal 1

INTERDISCIPLINARY CARE

Chairs: Peter Nydahl & Marieke van der Schaaf

11.00 - 11.20

O04

The added value of Speech and Language Therapists (SLT) in ICU

Jackie McRae (United Kingdom)

11.20 - 11.40

O05

The role of resilience on wellbeing

Margo van Mol (The Netherlands)

11.40 - 12.00

O06

Family participation

Élie Azoulay (France)

12.00 - 12.15

Discussion

12.15 - 13.30

Lunch

12.30 - 13.30

Poster viewing (even numbers)

13.30 - 14.15

MEET THE EXPERT SESSIONS - ROUND 1

Collegezaal 1

MTE1

Meet the expert session 1 - Weaning: a systematic team approach and successful implementation

Annemijn Jonkman (The Netherlands) | Beatrix Clerckx (Belgium) |

Monika Wäscher (The Netherlands)

K01.222-1

MTE2

Meet the expert session 2 - Cough augmentation techniques in ICU

Frederique Paulus (The Netherlands) | Louise Rose (United Kingdom) |

Willemke Stilma (The Netherlands)

Costerzaal

MTE3

Meet the expert session 3 - Ultrasound of the diaphragm: Missing piece of the puzzle?

Pieter Roel Tuinman (The Netherlands) | Heder de Vries (The Netherlands)

7th European Conference on Weaning and Rehabilitation in Critically ill Patients
9th & 10th November 2019, Amsterdam, The Netherlands

<i>Museum Vrolijk</i>	MTE4	Meet the expert session 4 - Team approach of early mobilization; how do we combine the optimal purpose for patient, nurse, physical therapist and the optimal practical expertise in early mobilization <i>Peter Nydahl (Germany) Juultje Sommers (The Netherlands) Eve Corner (United Kingdom)</i>
<i>Fonteinzaal</i>	MTE5	Meet the expert session 5 - Using FEES to support weaning, communication and swallowing <i>Jackie McRae (United Kingdom) Sandra Offeringa (The Netherlands)</i>
<i>De Vrijzaal</i>	MTE6	Meet the expert session 6 - ECMO a multidisciplinary approach overcoming mobilisation "impossibilities" <i>Dinis Dos Reis Miranda (The Netherlands) Siep Hool (The Netherlands) Marije Saeijs (The Netherlands) Marijke Verbiest (The Netherlands) Robert van der Stoep (The Netherlands)</i>
14.15 - 14.30		<i>Meeting room switch</i>
14.30 - 15.15		MEET THE EXPERT SESSIONS - ROUND 2
15.30 - 16.00		<i>Coffee break</i>
16.00 - 17.30		KEEP MOVING <i>Chairs: Greet Hermans & Peter Spronk</i>
<i>Collegezaal 1</i>		
16.00 - 16.35	O07	Building muscle mass and strength in patients <i>Zudin Puthuchearay (United Kingdom)</i>
16.35 - 16.45	O08	Physiotherapists' clinical reasoning and decision making processes when mobilizing patients who are critically ill: a qualitative study <i>Ólöf R. Amundadóttir (Iceland)Tba</i>
16.45 - 17.20	O09	Move in your own way <i>Eve Corner (United Kingdom)</i>
17.20 - 17.30		Discussion
17.30 - 18.15		<i>Drinks and bites</i>
19.00 - 22.00		<i>Conference dinner (separate registration required) - buses leave at 18.30 hrs</i>

SUNDAY NOVEMBER 10TH

09.00 - 10.30

Collegezaal 1

ICU REHAB (ACUTE AND CHRONIC)

Chairs: Nicholas Hart & Frederique Paulus

- 09.00 - 09.30 O11 Muscle metabolism in critical illness: implications for nutrition and exercise
Zudin Puthuchery (United Kingdom)
- 09.30 - 09.40 O12 Measurement validity of an electronic inspiratory loading device during
inspiratory muscle training in weaning failure patients
Marine Van Hollebeke (Belgium)
- 09.40 - 10.10 O13 Mobilization of nurses
Peter Nydahl (Germany)
- 10.10 - 10.20 O14 Improving information-giving to critical care patients to guide post discharge
rehabilitation: a Quality Improvement Project
Sarah Elliott (United Kingdom)
- 10.20 - 10.30 Conclusion
- 10.30 - 11.00 Coffee – tea

11.00 - 12.30

Collegezaal 1

INTERDISCIPLINARY

Chairs: Eve Corner & Vicky Gerovasili

- 11.00 - 11.30 O15 Interdisciplinary care is a continuum during and after ICU stay
Peter Spronk (The Netherlands)
- 11.30 - 11.40 O16 Exploring patients and relatives needs and experiences with family
participation in basic care in the ICU: a qualitative study
Karin Felten-Barentsz (The Netherlands)
- 11.40 - 12.30 Best practice video's:
- V01 University Hospital Southampton
Zoe van Willigen (United Kingdom)
- V02 University Hospital Leuven
Beatrix Clerckx (Belgium)
- V03 Medical Centre Leeuwarden
Dr. Peter Egbers (The Netherlands)
- V04 REMEO Stockholm
Liza Bergström (Sweden)
- V05 Harefield Hospital
Charlotte Pereira (The Netherlands)
- V06 UMC Utrecht
Germijn Heijnen (The Netherlands)
- V07 PICS Animation
Daniela Dettling-Ihnenfeldt (The Netherlands)
- 12.30 - 13.30 Lunch & posters viewing (odd numbers)

13.30 - 15.30

AFTER ICU

Chair: Leo Heunks & Louise Rose

13.30 - 14.00

Collegezaal 1

O17 From womb to adulthood: does music matter in the (N)ICU?
Artur Jaschke (The Netherlands)

14.00 - 14.10

O18 10-year health-related quality of life in ICU survivors
José Hofhuis (The Netherlands)

14.10 - 14.40

O19 The Post-Intensive Care Syndrome, right care at the right place?
Marike van der Schaaf (The Netherlands)

14.40 - 15.10

O20 State of the art - Weaning, rehabilitation & home ventilation centres: stepping up to improve long term outcomes
Nicholas Hart (United Kingdom)

15.10 - 15.30

Award ceremony, closing and hand-over to next city

FACULTY - Alphabetically



Élie Azoulay - MD, PhD

Hôpital St Louis, Director, Medical Intensive Care Unit / Professor of Medicine, Paris, France



Marianne Brackel

Chairman of IC Connect, patient organization for (former) ICU patients and family
Board member of the FCIC foundation | Former ICU patient | Youth Health Care physician
KNMG not practising



Beatrix Clerckx - PT

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Nicholas Hart

Guy's and St Thomas' NHS Foundation Trust, Professor of Respiratory & Critical Care
Medicine



Siep Hool

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Artur Jaschke

Amsterdam UMC, loc. Vumc, Lecturer, Master in Music Therapy, Neuromusicology



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Jackie McRae - PhD

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Margo M.C. van Mol - PhD

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**Zudin Puthuchery – MBBS, B.Med.Sci, D.UHM, PGCME, EDICM, MRCP, FHEA
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Honorary Consultant in Intensive Care, Royal London Hospital, Barts Health NHS Trust



Dinis Dos Reis Miranda - MD, PhD

Anesthesiologist-intensivist, Erasmus MC, Rotterdam, the Netherlands



Louise Rose – Prof, PhD

King's College, Professor of nursing, London, United Kingdom



Marije Saeijs - PT

Physiotherapist, Erasmus MC, Rotterdam, the Netherlands



Marike van der Schaaf - PT, Associate Professor, PhD

Amsterdam University Medical Centers (AMC), The Netherlands



Juultje Sommers - PT, PhD

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Peter Spronk - MD, PhD, EDIC

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Robert van der Stoep - PT

ICU Physiotherapist, Erasmus MC, Rotterdam, the Netherlands



Willemke Stilma - MSc, LL.M, RN

Educator in Nursing at Amsterdam University of Applied Sciences
PhD student with grant from NWO, the Netherlands Organization for Scientific Research



Pieter Roel Tuinman - MD, PhD

Intensivist-epidemiologist, Amsterdam UMC, location VUmc, Amsterdam, the Netherlands



Marijke Verbiest - PT

Physiotherapist, Erasmus MC, Rotterdam, the Netherlands



Heder de Vries - MD

PhD student, Amsterdam UMC, location VUmc, Amsterdam, the Netherlands



Monika Wäscher

Intensive care nurse & VAP Teacher Level 4 (movement stimulation in daily care),
Radboudumc, Nijmegen, the Netherlands

Abstracts/teasers

Oral Presentations

(in order of the program)

O01

Lessons from a patient journey

Marianne Brackel

IC Connect & FCIC foundation, The Netherlands

For most people critical illness and ICU treatment are life changing experiences that require long-term guidance from well-cooperating caregivers with knowledge of all the aspects of the Post Intensive Care Syndrome. This multidisciplinary care starts in the ICU and ends when the patient can live his post-ICU-life in the best possible way. In addition to good ICU follow-up care, knowledge about the long-term consequences of critical illness and ICU treatment is needed in health care and society. Good collaboration between healthcare providers, scientists and former ICU patients is essential to achieve that. The Dutch FCIC foundation and its patient organization IC Connect are good examples of this necessary collaboration. As a former ICU patient and Chairman of IC Connect I will share with you my hard learned lessons of my long patient journey and my vision on post ICU care, which starts in the ICU.

O02

ICU-acquired weakness; current perspectives

Janneke Horn

Amsterdam UMC, loc. AMC, Amsterdam, The Netherlands

Janneke Horn works as a neurologist-intensivist on the Intensive Care Unit of the Amsterdam UMC, location AMC. Her research focusses on brain injury after cardiac arrest and ICU acquired weakness. In her presentation she will present the current perspectives on ICU-AW. The primary aim is that everyone in the audience has the same up to date knowledge on this topic at the end of her presentation.

O03

Interdisciplinary care to optimize weaning: move as a team

Alexandre Demoule

Intensive Care Unit and Weaning center, La Pitié-Salpêtrière Hospital, Sorbonne University, Paris, France

No abstract available

O04

The added value of Speech and Language Therapists (SLT) in ICU

Jackie McRae

St George's University Hospitals NHS Foundation Trust & School of Allied Health, Midwifery and Social Care, Faculty of Health, Social Care and Education, Kingston University and St George's, University of London, London, United Kingdom

This talk will introduce the skills of Speech and Language Therapists and demonstrate their added value in the Intensive Care environment. Although they may focus on managing communication and swallowing impairments, there is additional input to help optimise mouthcare, secretion management and the process of weaning from ventilator and tracheostomy by ensuring involvement of the laryngeal structures to maximise quality of life.

O05

The role of resilience on wellbeing

Margo M.C. van Mol

Department of Intensive Care Adults, Erasmus MC University Medical Center, Rotterdam, the Netherlands

Resilience is the ability of humans to adapt when faced with difficulty or work-related stress. It is a necessary quality to foster wellbeing in the face of life's challenges. Resilient people do not only bounce back after a setback, they grow from the adverse event and get stronger and wiser. Even when the adverse events were perceived as traumatic (i.e., posttraumatic growth), which could be applied to the perspectives of both the patients and professionals.

People who are highly resilient find something good in any situation, are willing to learn from each negative experience and apply their acquired lessons in their future endeavors. People who are less resilient, are more likely to let problems linger for a longer period of time, to feel overwhelmed and victimized and to use maladaptive coping strategies (like substance abuse). Ultimately, limited resilience may lead to mental health problems like anxiety and depression and a lower quality of life

O06

Family participation

Elie Azoulay

Medical Intensive Care Unit - Hôpital St Louis & Professor of Medicine, Diderot University, Paris, France

No abstract available

MTE1

Weaning: a systematic team approach and successful implementation

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A structured team approach as a key to successful weaning.

In this session, three experts with various backgrounds (Beatrix Clerckx, physiotherapist from University Hospitals Leuven, Monika Wäscher, ICU nurse at a specialized weaning unit in Radboudumc Nijmegen, and Annemijn Jonkman, technical physician from the ICU of Amsterdam UMC) will present their team approach to weaning. How can we assess and treat difficult-to-wean patients, using a structured and multidisciplinary approach? In this workshop we provide you with both theoretical and practical information regarding the assessment of a difficult-to-wean patient, and we show you how to successfully implement personalized weaning schedules including respiratory muscle training and early mobilization.

MTE2

Cough augmentation techniques in ICU

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Under normal airway conditions, cough is the dominant airway clearance mechanism. In mechanically ventilated patients, presence of the endotracheal tube prevents normal closing of the glottis and depressed levels of consciousness interfere with an adequate cough reflex.

Manual hyperinflation (MH) is frequently applied maneuver in critically ill intubated and mechanically ventilated patients. MH is suggested to mimic a cough so that airway secretions are mobilized towards the larger airways where they can easily be removed. As such MH could prevent plugging of the airways. Another strategy to create an artificial cough could be Mechanical Insufflation-Exsufflation (MI-E). MI-E is a common treatment for patients with neuromuscular diseases and requiring ventilation in the home, but is not commonly used in the ICU as part of airway care and the weaning process.

In this workshop, we present the current evidence for cough augmentation techniques specifically MH and MI-E and demonstrate the use of MH and MI-E. We will exchange knowledge and ideas regarding which type of patients might best benefit from MH and MI-E in ICU.

MTE3

Ultrasound of the diaphragm: Missing piece of the puzzle?

Pieter Roel Tuinman, Heder de Vries

Amsterdam UMC, location VUmc, Amsterdam, the Netherlands

Ultrasound has become increasingly popular in the ICU because of its non-invasive nature and bedside application. Ultrasound can extend our physical examination taking and is often more precise than our hands, our eyes and our stethoscopes. A novel area of application for ultrasound is the diaphragm. The diaphragm is the most important muscle of respiration, but is rarely assessed in ventilated patients. Ultrasound of the diaphragm might be the 'missing piece of the puzzle' in the work-up and treatment of weaning failure. In this interactive expert session we will discuss how diaphragm ultrasound can help in the management difficult-to-wean patients, sharing both benefits and common pitfalls. By using interactive statements and ultrasound images we will try to solve the puzzle together!"

MTE4

Team approach of early mobilization; how do we combine the optimal purpose for patient, nurse, physical therapist and the optimal practical expertise in early mobilization

Evelyn J. Corner¹, Juultje Sommers², Peter Nydahl³

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Team approach of early mobilization; how do we combine the optimal purpose for patient, nurse, physical therapist and the optimal practical expertise in early mobilization. Life discussion between the ICU members and sharing practical expertise in early mobilization by training mobilization with among other things SaraCombilizer, standing help and the body weight supported treadmill. Meet the expert with your team to discuss and practice (SaraComobilizer, treadmill) about early mobilization.

MTE5

Using FEES to support weaning, communication and swallowing

Jackie McRae¹, Sandra Offeringa²

¹St George's University Hospitals NHS Foundation Trust, Honorary & Clinical Lecturer and Research Fellow, School of Allied Health, Midwifery and Social Care, Faculty of Health, Social Care and Education, Kingston University and St George's, University of London, London, United Kingdom

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This session will introduce the use of flexible nasendoscopy to enable a full evaluation of the dynamics of the pharynx and larynx to help identify specific areas of weakness or impairment and plan interventions to support communication and swallowing. There will be voting on areas of contention with opportunities for questions and discussion.

MTE6

ECMO a multidisciplinary approach overcoming mobilisation “impossibilities”

Dinis Dos Reis Miranda, Siep Hool, Marije Saeijs, Marijke Verbiest, Robert van der Stoep
Erasmus MC, Rotterdam, the Netherlands

Our workshop is a hands on approach simulating a “real life case” on VA ECMO with cannulation in groin and neckarea . Aim is to work and interact as a team. Doctor / nurse / physio.

Taking the participants through the process of possibilities and seemingly impossibilities of safe mobilisation.

Focusing on communication, interaction and making mobilisation on VA ECMO a pleasant experience for patient and team.

O07

Building muscle mass and strength in patients

Zudin Puthucheary

Barts and The London School of Medicine & Dentistry, Queen Mary University of London, London, United Kingdom

This talk will address the basics of muscle protein homeostasis, and the components of exercise and nutrition that stimulate these in the young and elderly.

O08

Physiotherapists’ clinical reasoning and decision making processes when mobilizing patients who are critically ill: a qualitative study

Ólöf R. Ámundadóttir¹, Helga Jónsdóttir², Gísli H. Sigurðsson³, Elizabeth Dean⁴

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²*School of Health Sciences, University of Iceland, Faculty of Nursing, Reykjavik, Iceland*

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⁴*Faculty of Medicine, The University of British Columbia, Department of Physical Therapy, Vancouver, Canada*

Aim: Few mechanically ventilated patients in the intensive care unit (ICU) are positioned upright and mobilized, despite evidence for its safety, necessity and feasibility. This study’s aim was to investigate factors in physiotherapists’ clinical reasoning and decision-making processes when initiating and progressing mobilization in patients who are critically ill and on mechanical ventilation.

Methods: Twelve physiotherapists working in a tertiary care university hospital participated in this two-phase qualitative study. They were observed before, during, and after a mobilization session with one patient, followed by a semi-structured interview. The data was analyzed with conventional content analysis.

Results: The results revealed six categories and four encompassing factors as being important in guiding participants’ clinical reasoning when mobilizing their patients. The categories are: patient; ICU-context; physical therapist; transfer; FITT parameters (frequency, intensity, type and time); and expected outcome. The encompassing factors are: safety and wellbeing; continuous assessment and intervention intertwined; individualized and response-driven intervention; and barriers and solutions.

Conclusions: The six categories and four encompassing factors identified and guided participants in their clinical reasoning and decision-making processes when initiating mobilization and progressing its parameters. The approach was goal-oriented and favored a response-driven rather than a protocol-driven approach to mobilizing patients who are critically ill, allowing the physiotherapist to individualize each mobilization session based on real time evaluation of the patient’s performance. Knowledge of such factors not only sheds light on processes typically used by physiotherapists in mobilizing patients who are critically-ill, but also helps inform how these processes can be taught to students.

O09

Early mobilisation in critical care- you've got to 'Move in Your Own Way'

Evelyn J. Corner

Brunel University London, London, United Kingdom / The Royal Brompton & Harefield NHS Trust, London, United Kingdom

Between 1990 and 1999 only five articles were published exploring physical function as an outcome after critical illness; rising to 19 articles between 2000-2009, and 157 articles between 2010-17. This reflects the exponential growth of interest into physical function interventions, early mobilisation, rehabilitation and long-term outcomes from critical illness¹. However, the studies exploring early mobilisation and rehabilitation in critical care have inconsistent results in terms of quantifiable benefit to patient outcome- so how do we as clinicians navigate this literature base, filter out the effective from the futile, translate the translatable, and embed this research into practice to optimise care?

This talk will explore the more recent studies of early mobilisation in critical care and how to translate that research into clinical practice no matter what your role is in the ICU... you've got to move in your own way.

Reference

1. González-Seguel F, Corner EJ, Merino-Osario C. International Classification of Functioning, Disability and Health Domains of 60 Physical Functioning Measurement Instruments Used During the Adult Intensive Care Unit Stay: A Scoping Review. *Phys Ther.* 2019;99(5):627-640.doi:10.1093/ptj/pzy158

O10

CANCELLED

O11

Muscle metabolism in critical illness: implications for nutrition and exercise

Zudin Puthuchearu

Barts and The London School of Medicine & Dentistry, Queen Mary University of London, London, United Kingdom

This talk will address our current knowledge on muscle metabolism and physiology in the critically ill patient, and the implications for nutritional and exercise interventions. Processes such as protein homeostasis, ATP generation and inflammation will be addressed, and how these might interact with current therapeutic interventions.

O12

Measurement validity of an electronic inspiratory loading device during inspiratory muscle training in weaning failure patients

Marine Van Hollebeke¹, Beatrix Clerckx², Greet Hermans², Rik Gosselink¹, Daniel Langer¹

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Introduction: A recently introduced electronic inspiratory loading device (EILD) provides valid information on breathing characteristics in COPD patients. This has not yet been confirmed in weaning failure patients.

Aim: To investigate the measurement validity of this EILD.

Method: In 30 patients, 64 training sessions were analysed. Flow and pressure signals of 2594 breaths, against a mean resistance of 24% of the maximal inspiratory pressure, were sampled and processed by the EILD (POWERbreathe KH2, HaB International,UK) and a pulmonary function device (Pocket-Spiro USB/BT 100, M.E.C) which served as gold standard.

Result: Small but significant differences in median breathing characteristics, such as total amount of breaths, inspiratory time, inspiratory flow and inspiratory pressure, were observed between the devices. Intraclass correlation coefficients were high and average bias small (range: -7to11%; Table1) indicating good to excellent agreement on a group level. However, the EILD missed ~6% of the breaths that could be recorded with the golden standard. These missed breaths had significantly lower tidal volume (median:

0,07L) compared to the golden standard (median: 0,44L). Furthermore not a single breath with a tidal volume below 0,1L was recorded by the EILD. In addition these missed breaths had significantly lower mean inspiratory flow (median: 0,12L/s) compared to the golden standard (median: 0,42L/s).

Conclusion: EILD provides valid estimates of breathing characteristics to quantify the load during inspiratory muscle training in weaning failure patients. However, breaths with a tidal volume lower than 0,1L and/or low mean inspiratory flow might not always be recorded with the inspiratory loading device.

O13

Mobilization of nurses

Peter Nydahl

Nursing Research, Department of Anesthesiology and Intensive Care Medicine, University Hospital of Schleswig-Holstein, Kiel, Germany

Early mobilization is a team approach and nurses can make substantial contributions to the success of the team. Nurses are team players, coordinating different professions including patients and families. Nurses organize the the daily schedules, educational meetings and promote culture changes towards ICU rehabilitation. At the same time, nurses are always too busy to mobilize patients, have no time, not enough staff, and too many tasks at the same time. Sometimes, nurses are difficult to understand. Nurses mobilize and appreciate help from others, but they make it different, with different purposes, different techniques, at different time points. This lectures will give some insights in the collaboration with this very special team member.

O14

Improving information-giving to critical care patients to guide post discharge rehabilitation: a Quality Improvement Project

Sarah Elliott¹, Armin Fardanesh², Stavroula Stavropoulou Tatla², Oliver Grassby²

¹*Medway NHS Foundation Trust, Therapies, Gillingham, United Kingdom*

²*Kings College London, Medical School, London, United Kingdom*

ICU survivors have a 1-year mortality rate of 30%, and a reduced quality of life associated with post-ICU syndrome; a triad of cognitive decline, physical weakness and psychiatric disorders. Early rehabilitation improves outcomes, leading to greater independence. The NICE CG83 guidelines instruct the provision of rehabilitation information to critical care patients on discharge. Currently, only a third of UK trusts meet these guidelines. Within 20 weeks, we aimed to achieve 100% patient and therapist satisfaction with the rehabilitation information given to patients at risk of physical morbidity on discharge from critical care at Medway Maritime Hospital. Critical care patient and therapist satisfaction was assessed using questionnaires at baseline and after each PDSA cycle. In PDSA1, a generalised rehabilitation information booklet was introduced. In PDSA2, a personalised rehabilitation plan for pre-discharge completion by the therapists was added so to tailor rehabilitation plans to individual patient needs. A shift was observed in critical care patient satisfaction scores, indicating a significant change in the median from 20% at baseline to 70% after PDSA2. This was also reflected in the therapist satisfaction scores which increased significantly from 60% at baseline to 80% after PDSA2.

The introduction of a generalised information booklet, supplemented with a personalised recovery plan, is an effective way of increasing critical care patient and therapist satisfaction with post-discharge rehabilitation information provision. This should translate to greater critical care patient engagement with rehabilitation and improved long-term outcomes. To further increase satisfaction, the addition of psychiatric input to the booklet is currently underway

O15

Interdisciplinary care is a continuum during and after ICU stay

Peter Spronk

Department of ICU, Gelre Hospitals Apeldoorn & UMC Amsterdam, location AMC, Amsterdam, the Netherlands

The coordination of care delivered to critically ill patients is a complicated process involving a myriad of care professionals. Especially in those patients with a long ICU stay, this coordination becomes essential in keeping focus of the ICU-team and all involved, e.g. dietician, PT, rehab specialist, (neuro)psychologist, SLP, OT, exercise physiologist, etc.

After ICU discharge, frequently a gap in care continuity is observed, while the coordination of care should continue even after ICU discharge in rehab centers, nursing homes, at home, or in hospices.

This talk will address the continuum of care and the barriers that we should take into account to make it happen in the real world.

O16

Exploring patients and relatives needs and experiences with family participation in basic care in the ICU: a qualitative study

Boukje Dijkstra¹, Karin Marie Felten-Barentsz², Margriet van der Valk³, Remco Ebben³, Lilian Vloet³

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³*HAN University of Applied Sciences, Emergency and Critical Care, Nijmegen, The Netherlands*

Aim: The aim of this study was to examine the experience(s), promoting and impeding factors, and wishes and needs of relatives and patients with family participation in the Intensive Care Unit (ICU).

Methods: An explorative study including inductive thematic analysis was performed.

Results: Fourteen relatives and twelve former patients were interviewed within two months after the patient's discharge from the ICU.

Several factors, already present before ICU admission, were considered relevant according to both patients and relatives: 1) knowledge of patients' wishes and needs and physical (im)possibilities, 2) former experience, 3) relationship and intensity and quality of the relation, and 4) individual and family manners and habits.

Relatives mentioned the following topics, concerning the patients' stay in the ICU: 1) being able to 'be there' for the patient, 2) not knowing what to do/could/might be done, 3) fear/insecurity of harming the patient, 4) own physical (im)possibilities, and 5) being able to do something for the patient (active coping style) <-> leaving the provision of care to health care professionals (passive coping style).

On patient level, the following factors played a role: 1) level of conscience, 2) stability of the patients' situation, and 3) length of the patient's stay. Another factor was the patient's concern about the possible strain experienced by relatives.

Conclusions: Patients' and relatives' experiences with family participation in the ICU vary, consistent with several personal, professional and organisational promoting and impeding factors and (un)known wishes and needs prior to admission and during the patient's stay in the ICU.

O17

From Womb to Adulthood: Does Music mater in the (N)ICU?

Artur C. Jaschke

ArtEZ University of the Arts, Department of Music Therapy, Enschede, the Netherlands & Beatrix Children's Hospital - University Medical Centre, Department of Neonatology, Groningen, the Netherlands & Amsterdam UMC, loc. VUmc, Department clinical Neuropsychology, Amsterdam, the Netherlands

In this talk, we will explore the influence of music based therapies and interventions from the neonatal intensive care unit up through childhood and into adulthood. Music touches us quite literally and provides us with and elegant insight into brain development, epigenetics and transfer to learning and experiencing the world around us. How does the brain process, perceive and produce music and how can this be used in clinical settings NICU and what are the benefits from music on cognitive development?

O18

10-year health-related quality of life in ICU survivors

Jose GM Hofhuis¹, Augustinus JP Schrijvers², Peter E Spronk¹

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²*University Medical Center, Utrecht, Julius Center for Health Sciences and Primary Care, Utrecht, The Netherlands*

Aim: The aim of our study was to assess the impact of ICU stay and change of perceived health-related quality of life (HRQOL) up to 10 years after ICU discharge.

Methods: We performed a long-term prospective cohort study in patients admitted for longer than 48 hours in a medical-surgical ICU. The Short-form-36 was used to evaluate HRQOL before ICU admission (by proxy within 48 h after admission of the patient), at ICU discharge, hospital discharge and at 1,2,5 and 10 years after ICU discharge (all by patients). Changes in HRQOL were assessed using linear mixed modeling.

Results: We included a total of 749 patients (from 2000 to 2008). At 10 years after discharge 149 patients could be evaluated. The mean scores of four dimensions in HRQOL; physical functioning ($p < 0.001$), role-physical ($p < 0.001$), general health ($p < 0.001$) and social functioning ($p = < 0.001$) were still lower 10 years after ICU discharges compared with their pre-admission levels ($n = 149$) and with an age-matched general population. Effect sizes were medium for physical functioning (0.77) and role-physical (0.65) and small for general health (0.48) and social functioning (0.41).

Conclusions: Physical functioning of ICU survivors remains impaired at 10 years after ICU discharge compared with their pre-admission levels and an age-matched general population. However effect sizes showed no important differences compared with pre-admission suggesting that patients have regained their age-specific HRQOL 10 years after ICU discharge.

O19

The Post-Intensive Care Syndrome, right care at the right place?

Marike van der Schaaf

Department of Rehabilitation Medicine, Amsterdam UMC, location AMC & Amsterdam University of Applied Sciences, Amsterdam, the Netherlands

Research on long-term outcomes after critical illness sheds light on the complexity of problems experienced by patient and family, known as Post-Intensive Care Syndrome (PICS). In the first twelve months after hospital discharge impairments in physical, mental and cognitive functions, leading to restrictions in daily activities and participation problems are common in the group of survivors. Several trials evaluated exercise-based rehabilitation interventions following discharge from hospital after critical illness.

In this presentation an overview will be provided on the current state of the literature and best practices on rehabilitation programmes for ICU survivors after hospital discharge will be discussed.

O20

State of the art - Weaning, rehabilitation & home ventilation centres: stepping up to improve long term outcomes

Nicholas Hart

Lane Fox Respiratory Services, Division of Pulmonary, Adult Critical Care and Sleep, St Thomas' Hospital, London, United Kingdom & Lane Fox Clinical Respiratory Physiology Centre, Centre for Human and Applied Physiological Science, School of Basic and Biomedical Sciences, Kings College London, United Kingdom & Guys and St Thomas' NHS Foundation Trust, London, United Kingdom & THORAX International Journal of Respiratory, Sleep and Critical Care Medicine

During this state of the art clinical review, Professor Hart will discuss the multi-professional approach to managing patients who are difficult-to-wean from invasive mechanical ventilation following a life-threatening critical illness. He will report on the UK approach to the management of patients with chronic respiratory failure as a consequence of neuromuscular disease, spinal cord injury, obesity and chronic obstructive pulmonary disease detailing the requirement of fully integrated technical, medical, nursing and therapy teams to deliver clinical, research and educational excellence which ensures the highest quality of

specialist multidisciplinary care support is provided to these complex respiratory patients.

Abstracts

Poster presentations

(P01 – P45)

P01
Setting up a regional interprofessional network to improve aftercare for survivors of critical illness: feasibility and outcomes of the REACH project

Mel Major^{1,2}, Daniela Dettling-Ihnenfeldt¹, Stephan Ramaekers³, Raoul Engelbert^{1,2}, Marike Van der Schaaf^{1,2}

¹Amsterdam UMC/University of Amsterdam, Department of Rehabilitation Medicine

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³Amsterdam University of Applied Sciences, Faculty of Health, School of Physiotherapy, Amsterdam, The Netherlands

Rationale and aim: An estimated 50% of survivors of critical illness in the Amsterdam region are discharged home, depending on primary care practitioners for their care and rehabilitation needs. Currently, in the Netherlands there is no established rehabilitation pathway for this population. This study aimed to set up a regional interprofessional primary care network tasked with provision of tailor-made rehab programs for patients discharged home after critical illness.

Methods: Identified regional stakeholders included: ICU survivors, physiotherapists, occupational therapists, dieticians, interdisciplinary primary care practitioner network Amsterdam (ELAA), professional associations, academic and regional hospitals and the faculties Health and Sports and Nutrition of the Amsterdam University of Applied Sciences. Stakeholders were invited to participate in a community of practice (CoP), the so-called REACH network: *REhabilitation After Critical illness and Hospital Discharge*. In an iterative process using meetings, workshops, and feedback sessions the CoP delivered practice recommendations related to hospital-to-home handover, clinimetrics and interventions, rooted in the concept of Positive Health as developed by Huber et al (2011); stimulating patients' resilience, self-management, adaptation and well-being.

Results: The REACH network is launched in the greater Amsterdam region and an interdisciplinary rehabilitation program for patients after hospital discharge has been co-designed. Within the REACH program physiotherapists are (often) the first contact after hospital discharge and as such have an essential role in comprehensive assessment of care and rehabilitation needs.

Conclusion: It is feasible to set up an interprofessional regional network to optimize ICU aftercare. Currently a METC-approved pilot study is testing feasibility and preliminary effectiveness of the rehab program.

Reference:

Huber M, Knottnerus JA, Green L, van der Horst H, Jadad AR, Kromhout D, et al. How should we define health? *BMJ: British Medical Journal* 2011;343

P02
CANCELLED

P03

**Dynamics of exercise capacity in lung transplant recipients
a systematic review**

J.W.M. van Grootel

UMC Utrecht, Intensive Care and Lung department, Utrecht, Netherlands

Background: Lung transplantation (LT) is a viable treatment option for patients with end-stage lung disease. The median survival of LT recipients increased over the years to 6.1 years (conditional median survival is 8.1 years for those surviving the first year). Previous research stated that pulmonary function, especially forced expiratory volume in one second (FEV1), becomes almost normal but maximal exercise capacity remains limited, compared to healthy controls.

Aim: The aim of this systematic review was to summarize studies analyzing pulmonary function, exercise capacity and peripheral muscle strength in the first year post-LT. Thereby, comparing the development of these physiological parameters of exercise in LT recipients, to healthy controls.

Methods: A systematic review was conducted. Searches were performed in PubMed/MEDLINE, Cinahl and Embase in February 2019. All included studies were quality appraised. Findings were narratively described.

Results: Fifteen studies were included in this systematic review, with a total number of 1471 patients. Firstly, 64% of the studies measuring pulmonary function show a reduced FEV1 post-LT. Secondly, 100% of the studies measuring the highest oxygen uptake (VO_{2peak}) using cardiopulmonary exercise testing show a reduced VO_{2peak} post-LT. Thirdly, 89% of the studies measuring six-minute walking test show a reduced walking distance post-LT. Fourthly, 84% of the studies measuring quadriceps force (QF) show a reduced QF post-LT.

Conclusions: This systematic review shows reduced exercise capacity is frequently seen in LT recipients. Only a few of the included patients reached normal levels of exercise capacity, even with substantial recovery time post-LT (months to years).

P04

Critical care to home: complex discharge review

Jeong Su Lee, Ashling Corcran

Guy's and St Thomas' NHS Foundation Trust, Occupational therapy, London, United Kingdom

A retrospective data review was conducted at Remeo Lane Fox ventilation unit to examine the patient's flow between September 2018 and June 2019. A total 31 patients were discharged from the critical care centre to the community and the key areas that caused challenges in complex discharge were identified. Firstly, it was highlighted that 31 patients were discharged to 21 different boroughs which added to the complexity of discharge process. Secondly, family dynamics was highlighted as 6 out of 31 discharges were identified as complex due to family dynamics causing a median of 58 days length of stay. The challenges were around family being slow to select nursing homes or declining a certain care agency. These challenges become more problematic as there are a limited number of nursing homes and care agencies available to look after tracheostomy ventilated or NIV patients in the community. In addition, those patients that were discharged to rehabilitation units and nursing homes took more than 61 days to do so, as there are few places that this patient group can access to. Thirdly, training carers also took longer than 50 days, to be ready to care for the patients. These reasons for delay are not easy to address as they are mainly caused by external factors. This is a huge external factor that cannot be addressed by the REMEO centre unit alone. However, LFU/ REMEO MDT led study day is suggested as a step towards to addressing this issue.

P05 – P09
CANCELLED

P10
Implementation of a Physiotherapy led 'Tracheostomy Round' in a Cardiothoracic Critical Care Area (CCA)

Annie Ryan

Royal Papworth Hospital, NHS Foundation Trust, Physiotherapy, Cambridge, UK

Aim: To describe the experience of implementing a physiotherapy led tracheostomy round (TR) on a cardiothoracic critical care area (CCA).

Guidelines for the Provision of Intensive Care Services (GPICS, 2019) outline that physiotherapists should have a key collaborative role in tracheostomy weaning plans. Current practice on our CCA involves the medical team prescribing a daily weaning plan.

The aim was to implement a daily physiotherapy TR for patients with a tracheostomy. A weaning plan would then be agreed with the patient, nurse and CCA team.

Methods: Data was collected for each patient and set questions were asked each day during TR regarding weaning.

Results: Over a 4 month period, TR round was completed on 29 out of a possible 81 days.

TR initially occurred on average once per week. In the later 2 months TR took place at least 3-5 days per week.

Barriers to TR included: lack of staff, no patients with a tracheostomy and time constraints.

Data collected shows that the weaning plan was consistently communicated within the CCA nurse. The plan was not consistently discussed with the patient or CCA medical team.

Conclusion: Current practice is not in line with the GPICS standards. The implementation of a TR is a step closer to physiotherapists having a collaborative role in tracheostomy weaning plans. A factor limiting collaborative working is the absence of central documentation of TR and absence of discussion with CCA MDT. Future work needs to focus on the establishing meaningful MDT discussion regarding weaning plans.

P11

Humanising the critical care department to improve the care of patients, relatives and staff

Susie Chrystal

It is widely recognised that critical care environments are extremely pressured and medicalised. This can lead to the process of dehumanising patients for example referring to them as bed numbers or conditions rather than their name.

Combined with delirium this can make critical care departments a very frightening place for patients. Staff can also become desensitised to the human element of patient care when facing pressures of workload and potential burnout. Shift patterns can lead to staff not getting to know patients and families as they care for people in a fragmented way.

In the critical care department at the Queen Elizabeth Hospital in Gateshead new initiatives have been introduced to counteract this process of dehumanising.

Over a year ago open visiting was implemented to allow relatives to visit at any time. 'Introduction to me' leaflets are being used for all intubated patients.

Since last year a live musician has visited every month to play the ukulele which has been very enjoyable for all. This year an ex patient who has been actively involved in the local ICUsteps group has started as a volunteer in the department - he is available to talk to relatives, staff and patients.

There is a therapeutic activities box on the department with items ranging from playing cards to nail varnish to crossword books.

In the future I would like to introduce therapy dogs visiting the department and develop some private garden space in the hospital.

Feedback from staff, relatives and patients has been positive for all these interventions.

I hope that we will see more efforts to humanise critical care to the great benefit of all.

P12

Factors Associated with Failed Extubation in a Cardiothoracic Intensive Care Unit

Kirsten Fleming¹, Chloe Meehan², Ruthann Curran², Katie Dowling², Claire Purkiss², Evelyn J Corner²

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²The Royal Brompton and Harefield NHS Trust, Cardiothoracic ICU Therapy, London, UK

Aim: Mechanical ventilation (MV) is a lifesaving intervention and prolonged MV is associated with negative patient outcomes. Objective; to explore the local factors and clinical characteristics associated with failed extubation (FE).

Methods: Data was retrospectively collected from clinical records. The Chelsea Critical Care Assessment tool (CPAx) is a validated measure of physical function in the ICU, incorporating respiratory and physical function. ICUAW is associated with MV, early CPax scores may be associated with reintubation rates. Descriptive statistics and Mann-Whitney U test were used. This study was part of a Masters and therefore time limited and underpowered.

Results: Twenty-eight patients were included in final data analysis. Mean age 54.4 years, 79% male, 10 failed extubation (35.7%) and re-intubation rate 17.86%. Comparisons between the patients who failed and those successfully extubated showed no significant difference between the groups for age, gender, number of comorbidities, APACHE-II score, hospital length of stay (LOS) and admission diagnosis.

The median days of MV for failed versus successful extubation was 16.0 versus 8.0 days ($p=0.067$)(Figure 1), median ICU LOS was 23.5 versus 11.00 days ($p=0.067$). Failed extubation was associated with longer duration of endotracheal intubation, 8.0 versus 4.0 days ($p=0.041$)(Figure 2). The median pre-extubation CPax score was 4.5 in the unsuccessful group versus 5.5 ($p=0.648$) in the successful group.

Conclusion: Local reintubation rates are similar to national figures. Longer duration of ETT prior to extubation was associated with extubation failure. There was an insignificant trend towards longer LOS and days of MV in those that failed extubation.

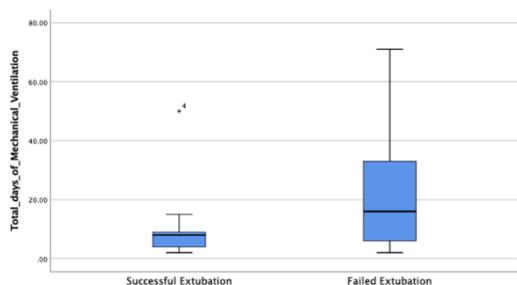


Figure 1: Box and whiskers plot demonstrating association between total duration of MV and FE

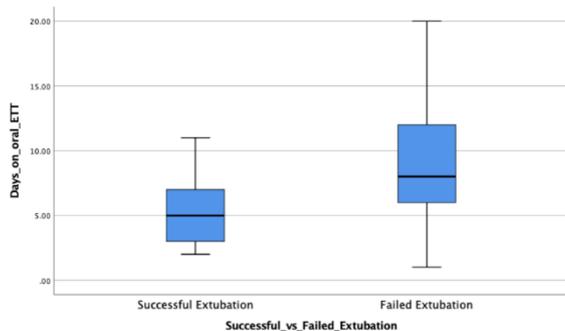


Figure 2: Box and whiskers plot demonstrating association in total duration of ETT and FE

P14

#Rehablegend campaign a motivational tool to empower and promote excellence

Kate Tantom

University Hospitals Plymouth NHS Trust, Critical Care, Plymouth, UK

Aim: The #Rehablegend campaign aims to motivate, support and facilitate rehabilitation by empowering individuals, promoting the 'little things' that can be done to enhance recovery. In any caring organisation, its greatest asset is its workforce. A team that irrespective of designation, role or location pull together to make a difference and to provide care.

Methods: Patient badges, staff pin badges, cards, lightboxes are awarded by the ICU rehabilitation team to individuals who have done a specific task that will promote, support or facilitate rehabilitation. They are then photographed (with consent) and these images and stories are shared on social medial platforms. These physical mementos offer recognition of patient rehabilitation journeys, staff rehabilitation work and galvanize teams to work together to support rehabilitation. These images and patient stories are then fed back to clinical staff to demonstrate the impact of their role in the patient's recovery.

Results: The campaign has been adopted by 15 other centres in the UK and Europe and the social media impact sizeable. We have had patients returning to award clinicians #Rehablegend badges and we have patients sharing their recovery journeys online. We have seen a significant increase in staff motivation to perform rehab and we have seen the campaign follow patients to wards and rehabilitation centres post ICU.

Conclusions: Cultural transformation, sustainability of change is only feasible in a motivation and supported workforce. The #rehablegend campaign offers a motivational tool that can be adopted by inter-professional teams to create a common patient focused language and drive for recovery and rehabilitation in ICU.

P15

Exploring nurses and other professionals experiences with family participation in basic care in the ICU: a qualitative study

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Aim: The aim of this study was to examine the experience(s), promoting and impeding factors, and wishes and needs of nurses and other professionals with family participation in the Intensive Care Unit (ICU).

Methods: An explorative study including inductive thematic analysis was performed.

Results: Three focus group interviews with twenty nurses, one nursing assistant, five physicians, three physical therapists and one speech therapist working in three Dutch ICUs were performed.

Several factors, on the professionals' level, were considered relevant: 1) attitude towards family participation in basic care (positive or reserved), 2) concern about the possible strain experienced by professionals, 3) concern about additional physical load due to assistance of inexperienced relatives.

On patient level, the following factors were mentioned: 1) insecurity about the patients' wishes and needs, 2) patient safety concerns, 3) level of conscience, 4) stability of the patients' situation, 5) length of the patient's stay.

On the relatives' level, the following factors were described: 1) former experience, 2) relationship, 3) concern about the possible strain experienced by relatives, and 4) physical (im)possibilities.

Common factors were: 1) the need for building a relationship with the patient and his relatives, 2) seeing family participation in basic care as a process, and 3) agreement on possible activities that can be performed by relatives.

Conclusion: Nurses' and other professionals' experiences with family participation in the ICU vary, consistent with several individual, professional and organisational promoting and impeding factors and (un)known wishes and needs of patients and relatives.

P16

Family participation in physical activity promotion at the Intensive Care Unit: a longitudinal qualitative study

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Aim: To explore the needs, beliefs, feelings, and behaviour of adult patients' family at the intensive care unit (ICU), regarding participation in physical activity promotion.

Methods: Longitudinal qualitative study design following a grounded theory approach. Family was interviewed at 4, 8, and 12 days after their relative's ICU admission. Data were analyzed using constant comparison.

Results: Twenty five semi-structured interviews were conducted (3 parents, 3 children (-in-law), 2 siblings, 2 spouses), nine of them were willing to participate during activity sessions. Family believed that physical activity promotion at the ICU improves recovery. Actual participation in physical activity promotion decreased feelings of powerlessness and uselessness. Family told that information related to the (changing) physical capacity of the patients and instruction, guidance, and invitation by healthcare providers might stimulate participation in physical activity promotion.

Conclusion: The conceptual model shows how family participation in physical activity promotion at the intensive care unit changes from a 'passive role', within negative beliefs and feelings of uselessness and powerlessness, towards 'proactive promotion' within feeling useful and being part of the team.

P17

Visualising Recovery - A case study

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Aim: Rehabilitation in Critical care requires significant clinical intervention and it is the intention of this project to use Information Visualisation to animate recovery within Critical Care.

Methods: In partnership with the School of Computing at Plymouth University we have built an application that utilises physiological and rehabilitation data from our Electronic Patient Record. We have used these data to build a set of images of Recovery. We used data mining techniques, partnered with Information Visualisation to create innovative representations of real time patient data. This application enables clinicians to intuitively track patient progress. These data are then collated and can be animated to highlight clinical progression.

Results: We have successfully animated the recovery of a 49 year old female, with a 60 day stay in Critical Care after contracting Pneumonia in December of 2018. Core clinical data has been overlaid with rehabilitation data to view the trajectory of recovery. This case study demonstrates how multiple routine outcome measures can be triangulated to capture a rehabilitation journey. This measure can then be used by clinical teams, patients and loved ones to support recovery during and after critical illness.

Conclusion: This application has the potential to support resource allocation and to demonstrate the efficacy of clinical rehabilitation in Critical Care. This Information Visualisation tool allows clinical teams, patients and their loved ones to track progress. Goal directed care can then be overlaid and self- directed rehabilitation initiated.

P18

Effects of extra early mobilisation after open pancreaticoduodenectomy (Whipple procedure)

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Introduction: Pancreaticoduodenectomy (PD) or Whipple procedure is a high risk surgery where the majority of patients develop postoperative atelectasis, however the risk of other cardiovascular complications is low. Mobilisation is known to increase ventilation as well as circulation but studies are missing concerning the effects of mobilisation after major surgery.

Aim: The purpose of this study was to evaluate the circulatory and respiratory effects of extra early postoperative mobilization after PD.

Method: A group of patients 122 scheduled to undergo open PD and post-operative care in ICU accepted to participate in study. Of those patients, 42 dropped out because of: 21 no or other surgery performed, 18 logistic reasons (arrival night, not extubated, reoperation for bleeding, left-out parameters), 1 declined post-operative participation, 2 declined mobilisation in the evening due the pain. Of the remaining 80 patients 40 had been randomised to intervention group (mobilised out of bed 3 hours after arrival at post-operative department in the evening on the day of surgery and 60 degree head of bed elevation when resting in bed) and 40 to control group (mobilised out of bed the day after surgery and 30 degree head of bed elevation when resting in bed according to current practice). Outcome variables include e.g. noradrenaline (NA), postoperative length of stay (PLOS) in ICU and feasibility. The groups were comparable at baseline. Current results were based on included patients. Inclusion criteria was normal surgery course; 6-8 hours.

Results: All patients in the treatment group were mobilised to sitting on side of bed (SOSOB) on the day of surgery. Time spent SOSOB was 6 minutes, median (2-20). Twenty-four of the patients also stood up 2 minutes, median (0.08-5).

The reasons for terminating the mobilisation was low blood pressure (n=16), dizziness (n=4), nausea (n=5), vomiting (n=1), pain (n=5), tiredness (3), concern (n=1), leg weakness (n=2) and confusion (n=1).

The duration of noradrenaline was significantly shorter in the treatment group (14 ± 12.7 vs 8 ± 8.7 hours). Post-operative length of stay was shorter in the treatment group (23 ± 10.9 vs 21 ± 5.2).

Conclusion: The results from this study indicate that patients undergoing open pancreatic surgery can be mobilised to SOSOB on the day of surgery but only for short periods of time and negative side effects are common. However, mobilisation seems to have an impact on postoperatively use of NA and PLOS in the post-operative ICU.

P19

Effects of intensive upright mobilization on outcomes of mechanically-ventilated patients in the intensive care unit: A randomised controlled trial with 12-months follow-up

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P20

Increasing protocolled mobilization of ICU patients – a quality improvement project

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Aim: Early mobilization of patients in the intensive care unit (ICU) may improve functional outcomes after discharge, reduce delirium and days on mechanical ventilation, however, nurses may overlook opportunities for patient mobility and exercise as part of care activities.

The aim of the study was to increase frequency of active mobilization and exercise in the ICU by implementing a protocol for mobilization.

Methods: As part of a quality improvement study, a protocol for mobilisation was developed and implemented at two regional hospital ICUs. Drivers for change was identified as 1) daily screening of patients mobilization needs and 2) increasing collaboration between physiotherapists and nurses based on the screening and 3) increasing awareness of opportunities for active exercise.

The protocol divided patients into four levels (level 0, critical, unstable patient, level 1: critical, stable condition, level 2: stable condition, awake and highly affected mobility, level 3: stable condition and moderately affected mobility). Patients' abilities for mobilisation and exercise were assessed daily using the protocol and followed up by active exercise as appropriate. Patient records were audited several times to follow implementation of the protocol.

Results: Three consecutive audits including a total of 162 patient-days were compared to a baseline audit of 20 patients. Before implementation of the protocol, 45.5% of patients at level 2 received active exercise. After one year, 71.4% of patients at level 2 received active exercise according to protocol.

Conclusion: Implementation of protocolled mobilization increased frequency of active exercise in ICU patients, however, further improvement remains possible.

P21

Spontaneous breathing trials (SBT) to facilitate weaning from mechanical ventilation with a diaphragmatic dysfunction following an aortic dissection repair

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Aim: Prolonged ventilation and cardiac surgery are both known causes of diaphragmatic dysfunction. The causes are unclear but are thought to include atrophy, a decreased force-generating capacity, direct injury during surgery and injuries during manipulation. Diaphragm weakness is a recognised cause of weaning failure. Inspiratory muscle training (IMT) loads the diaphragm and accessory muscles with the aim of increasing muscle strength and endurance (1) and thus, facilitating weaning from mechanical ventilation. We hypothesise that SBT's would improve diaphragmatic strength to facilitate weaning from mechanical ventilation.

Method: A single case at Hammersmith Hospital of a 67 year old lady transferred from another ICU post emergency aortic dissection repair, tracheostomy in situ and unable to wean from mechanical ventilation, presenting with left diaphragm immobility.

A programme of SBT's to facilitate IMT was implemented via removing pressure support from the patients' ventilation for increasing periods of time; 3 minutes – 15 minutes, 5 times daily alongside daily mobility and a general strength training programme.

Results: The patients negative inspiratory force (NIF) improved from - 8 to - 18 within a 2 week period consisting of 38 sessions of SBT's. The patient was weaned off mechanical ventilation and successfully decannulated 4 weeks after initiating IMT. SBT's were well tolerated with no adverse events.

Conclusion: The initiation of spontaneous breathing trails as part of an IMT programme improved the NIF of a patient with a diaphragmatic dysfunction and their ability to wean from mechanical ventilation. Further research is required, looking at dose, intensity and long term outcomes.

References:

1: Moodie L, Reeve J, Elkins M (2011) Inspiratory muscle training increases inspiratory muscle strength in patients weaning from mechanical ventilation: a systematic review. *Journal of Physiotherapy* (57): 213 – 221.

P22
Responsiveness and Construct Validity of the Chelsea Critical Care Physical Assessment Tool in a Cardiothoracic ICU

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Aim: To date there has been no work which looks specifically at validity of The Chelsea Care Physical Assessment tool (CPAx) in an adult cardiothoracic ICU (CICU). The aim is to explore the responsiveness and the construct validity of the CPax in the CICU.

Methods: Retrospective observational cohort study in a CICU in London - 10/2018 to 02/2019. Inclusion criteria: in ICU for at least 48 hrs with recorded CPax scores.

Patients were assessed on the CPax at CICU admission, CICU discharge, High Dependency Unit (HDU) discharge and ward discharge. Patients were separated into three survival categories and one non-survival category: home with no rehabilitation needs, home with community support, another rehabilitation facility, repatriated and nonsurvival from ICU.

Results: A total of 59 patients were included. There was a significant difference in median CPax scores at all time points ($p < 0.001$). Post hoc analysis showed between group differences were also significant ($p < 0.05$) for all time-points apart from HDU discharge and ward discharge scores. The CPax MDC was 4. 29% patients returned home with no rehabilitation needs, 8% returned home with community support, 29% went to another rehabilitation facility, 17% were repatriated and 17% died in the ICU. A significant difference was found in the median CPax score between discharge location groups ($P < 0.001$)

Conclusion: The CPax is able to detect clinically important changes in patients' physical function and has a limited floor and ceiling effect. The CPax assessment in CICU has shown a strong association with care needs at hospital discharge.

P23

Roles of Dutch speech-language therapists on intensive care: room for improvement?

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Aim: The aim of this study was to investigate the dysphagia-related tracheostomy management of speech-language therapists (SLTs) working on Dutch ICUs and their scope of practice, and to compare with international reports.

Methods: We approached SLT departments of all 92 hospitals in the Netherlands to complete an online questionnaire about their involvement on the ICUs. The results were compared with similar studies done in Australia (2007) and the UK (2014) and recent national guidelines.

Results: Sixty-two SLT departments completed the questionnaire. Swallowing assessment is primarily done by bedside evaluation (95%), consistent with previous reports; 17% usually to always uses FEES, more than in previous reports, but less than anticipated in recent guidelines. Dysphagia management is usually or always done with a deflated cuff (92%).

Ten percent of SLTs independently use any type of suctioning during their intervention. In 31% of the hospitals there is a multidisciplinary tracheostomy team of which half include an SLT (16%) and 16% of SLTs is usually to always involved in decision making processes regarding decannulation. However, in recently published guidelines these roles are explicitly mentioned as being part of the scope of practice of SLTs.

Conclusion: There is apparent clinical consensus in dysphagia-related tracheostomy management among Dutch SLTs and clinical practice is overall similar to other countries. However, Dutch SLTs seem to lag behind in the use of FEES, applying suctioning techniques and being involved in multidisciplinary decision making processes, including steps to decannulation. This suggests room for improvement in this field of advanced practice.

Reference

1. McGowan SL, Ward EC, Wall LR, Shellshear LR, Spurgin A-L. (2014) UK survey of clinical consistency in tracheostomy management. *Int J Lang Commun Disord*, 49, 1, 127-138

P24

Improvements in inspiratory muscle oxygenation following inspiratory muscle training (IMT) with Tapered Flow Resistive Loading (TFRL) in difficult to wean patients

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Aim: IMT increases inspiratory muscle strength in weaning patients. Whether IMT can improve inspiratory muscle oxygenation is unknown. A randomised controlled trial to evaluate the effects of IMT versus SHAM on inspiratory muscle oxygenation in difficult to wean patients.

Methods: 12 patients (55±18years, Pimax: 34±2cmH₂O] were allocated to an IMT(n=6) or a SHAM(n=6) training group. Using TFRL device, both groups performed daily training sessions (4sets, 6–10breaths) until successful weaning. IMT group trained initially at 30% of baseline Pimax, aiming at reaching 50%Pimax. SHAM group trained at 10%Pimax, not adjustable. Fractional oxygen saturation (StiO₂%) of scalene and sternocleidomastoid muscle (by near-infrared spectroscopy) and inspiratory flows were evaluated during a standardised training session including 4 sets of 6 breaths at 30% of baseline Pimax, before and after the intervention period.

Results: Days on mechanical ventilation and the number of training sessions were comparable between the two groups (IMT: 47±9days and 15±4sessions vs SHAM: 46±11days and 16±3sessions). After intervention, IMT group significantly increased (p<0.01) peak inspiratory flow from 740±30 to 1000±50ml and tidal volume from 461±30 to 699±60ml but not the SHAM group (from 930±60 to 900±70ml and 569±40 to 639±60ml, respectively, p>0.05). IMT group exhibited significantly less decrease (p<0.05) in StiO₂% of scalene (from -1.30±0.72% to -0.28±0.29%) and sternocleidomastoid muscle (from -1.15±0.32% to -0.66±0.57%) during the standardized training session but not the SHAM group (scalene from -1.74±0.44% to -1.19±0.69% and sternocleidomastoid -1.60±0.77% to -3.54±1.48%).

Conclusion: This interim analysis shows that IMT using TFRL can improve inspiratory muscle oxygenation in weaning patients.

P25
Introduction of TASK (Therapy, Activity, Skills and Kinesiology) Boards for upper limb rehabilitation on the General Intensive Care Unit (GICU)

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Title: Introduction of TASK (Therapy, Activity, Skills and Kinesiology) Boards for upper limb rehabilitation on the General Intensive Care Unit (GICU).

Aim: Previous resources for upper limb rehabilitation were sometimes rejected by patients for being “too childish” or toy-like. Therefore, our aim was to design and develop a functional tool which catered for a variety of upper limb functions and gave the patient a purpose or end product to improve engagement in upper limb rehab.

Method: The Senior Occupational therapist on GICU at University Hospital Southampton collaborated with Remap to design and create this tool. Remap are a charity of volunteers who custom-make equipment to help disabled people live more independently. Two activity boards were designed; one to challenge fine motor skills and one for gross motor skills and strength. The boards can be used on a bedside table from either the bed or chair. Each board contains functional activities that challenge the upper limb including range of movement, precision, power grips and bilateral tasks. The activities can be graded or adapted depending on the patient’s ability. Alongside the boards there is an individual progress sheet for patients to set goals and track their progress.

Results: Patient feedback is extremely positive so far. The graded approach to the tasks keeps patients motivated and gives them achievable goals.

Conclusion: The recent introduction of our innovative TASK boards seems to be improving patient engagement with therapy and has facilitated a more focussed approach to upper limb rehabilitation.

P26

Outcome of patients managed in a weaning and rehabilitation care unit

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Introduction: Outcomes in respiratory weaning centers poorly described and seem to depend on the organization of healthcare systems and patients case mix. Called "SRPR", the weaning center of Pitié Salpêtrière hospital group admits patients for weaning and rehabilitation from medical and surgical intensive care units.

Objective: To describe patient's characteristics and outcomes (weaning and survival) and to compare in subgroups according to the initial context: medical, surgical or cardiac surgical context.

Design: A monocentric retrospective observational study conducted from February 2016 to June 2018. A successful outcome was defined by the association of survival and weaning from invasive ventilation. A uni- and multivariate analysis assessed the factors associated with a successful outcome. Vital status at discharge, at 3, 6 and 12 months has been analyzed according to the use of a ventilator at discharge, and the initial context: medical, surgical or cardiac surgical context.

Results: Of the 215 patients included, 167 (78%) had a successful outcome, of which 62 (37%) using non-invasive ventilation (NIV) at discharge. Among patients discharged from the SRPR 87%, 84% and 80% were alive at 3, 6 and 12 months without any significant difference in use of NIV. No significant difference was found between the 3 groups medical, surgical and cardiac surgical in terms of NIV use, survival at discharge, 3, 6 and 12 month. In cardiac surgery group, there is more use of NIV 17 (46%) versus 25 (35%) and 20 (33%) ($p=0.33$), this results is non-significant but surprising in a group where there is significantly less respiratory history (35% versus 64% and 46%, $p=0.003$).

P27

An MDT-led, person-centred approach to rehabilitation following critical illness: A case study of a long stay patient

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Aim: To demonstrate how a collaborative, person-centred MDT approach to patient rehabilitation following critical illness can positively affect rehab outcomes.

Method: Mr C experienced complications following oesophageal surgery, requiring five months of intubation on the Intensive Care Unit (ICU) at University Hospital Southampton. His barriers to rehabilitation included ICU acquired weakness, delirium and extremely low mood.

MDT rehabilitation sessions were conducted and this team remained consistent throughout his journey, enhancing the therapeutic relationship. Regular goal setting meetings were also held by this team. A purposeful, functional approach to rehabilitation was adopted, including using an IPAD for communication, virtual Motomed routes and a chart to map his 'journey' home. A patient profile was completed by his family. To optimise engagement we planned trips off ICU, visit from his dog, a local falconer with his hawks and rehabilitation in the gym, all whilst intubated.

Before transition to the ward, rehabilitation sessions included the ward team and visits to the ward so that he could become familiar with this new team and environment.

Results: He is now recovering well at home with no ongoing care needs, we believe that our MDT led, person-centred approach to rehabilitation was key to achieving this.

Conclusion: Working as a collaborative consistent MDT for long-term patients in ICU can improve their physical and non-physical outcomes on transfer to the ward and then into the community.

P28

Exploration of current practice of early mobilisation and potential barriers within a tertiary neurosurgical critical care unit.

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Aim: Prolonged bed rest and immobilisation in critically ill patients is detrimental. Early mobilisation can safely reduce the complications associated with immobility, but there is a lack of robust evidence in the neurosciences population. Recent studies have started to identify patients who may benefit despite their complex neurological and medical status.

The aim of this project was to review our current practice and examine any potential barriers to mobilisation within a specialist tertiary neurosurgical critical care.

Methods: Retrospective analysis of 20 patients admitted to the neurosurgical critical care unit over a four week period in 2018. We collected the following data: time from admission to first mobilisation, method of mobilisation, barriers to mobilisation and which profession completed initial mobilisation. **Results:** Average time to mobilise from admission was 6 days. Time to mobilise after being declared medically fit was 0 days. The most frequent barriers to early mobilisation were neurological and cardiovascular instability. Although less frequently occurring, confirmed vasospasm delayed mobilisation by 11 days. Patients were mobilised first by a physiotherapist 60% of the time and by nursing staff 35%. Presence of an endotracheal tube was not a primary barrier.

Conclusion: Time to first mobilisation was in line with previous research. There is a clear ethos of early mobilisation within the service. The most significant barrier was the presence of vasospasm which will require further exploration with the MDT and determination of safe working parameters.

P29

Development and pilot evaluation of a standardized protocol for measuring the M. Rectus Femoris circumferential area

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Aim: Ultrasound (US) assessment the M. rectus femoris has been shown to be a relatively simple method to quantify muscle wasting in the ICU. Currently, there is great difference in the tools and methods used to adequately establish and measure the RF circumferential area (RF_{CSA}). Studies differ in collected data, equipment used and location of measurement. In this study, a measuring protocol, easily implementable in clinical practice was developed. Also, intra- and interobserver variability was evaluated.

Methods: A GE Logiq P9 was used. Three measurements, per leg and per observer were conducted on 10 volunteers resulting in 240 measurements of the RF_{CSA}. Inter- and intra-observer variability was determined through a Bland-Altman analysis.

Results: The intra-observer analysis resulted in a mean RF_{CSA} of 4.3 cm² and a within-subject standard deviation (SD) of 0.30 cm². In the inter-observer analysis a SD of 0.64 cm² with a mean bias of -0.12 cm² and limits of agreement (LoA) -1.28 and 1.04 cm² was found. In the inter-observer analysis of just the outlining a mean bias of -0.09 cm², LoA: -0.94 and 0.76 cm² was found.

Conclusion: Although only 2 observers were evaluated in this pilot analysis, observers seem to be able to precisely conduct US-measurements and create outline US images. However, agreement between observers was low. Awaiting the results of more observers, these experiments may suggest that US measurement of the M. Quadriceps need to be conducted by the same observer or more attention needs to go out to training to improve inter-rater variability.

P30

The role of the Occupational Therapist in the multidisciplinary team at the Intensive Care Unit

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Aim: There is a growing body of evidence that involving occupational therapists in the ICU multidisciplinary team contributes to reducing length of stay in the ICU and overall in the hospital. Evidence has also shown that patients that have received occupational therapy in the ICU have on discharge a higher functional independence level.

Methods: Through literature searches, professional development days and the forming of a Scandinavian network for occupational therapists working in ICUs, have we been able to promote and support our professional growth in this specialised area and increase our knowledge and skills.

Results: Interventions that show some evidence of reducing length of stay and achieving higher functional independence levels, include task specific training of basic activities of daily living and cognitive and multisensory stimulation. Early mobilisation in conjunction with occupational tasks (not just sitting and standing) is vital.

In addition we can contribute to systematic monitoring and treatment plans for delirium.

Conclusion: Occupational therapists supplementary to the multidisciplinary ICU team fulfill an important role. Including the patients' functional wishes in our assessment and intervention of everyday activities with a strong focus on their functional resources helps patients experience self-determination. They reach a higher functional independence level and experience improvement in quality of life. It furthermore reduces activity deprivation which in turn reduces delirium and institutionalisation.

P31

Feasibility of a protocol for Inspiratory Muscle Training at the Intensive Care Unit

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Aim: Inspiratory Muscle Training (IMT) may shorten the duration of weaning from mechanical ventilation. The IMT-protocol as used at our university teaching hospital has not been systematically evaluated on its feasibility before. Our first aim was to gain insight into the number of patients admitted to the ICU who may be eligible for IMT. The second aim was to evaluate the feasibility of the IMT protocol.

Methods: From February 2019 to May 2019, patients were identified who received >3 days of invasive mechanical ventilation and started weaning.. Subsequently, contraindications for IMT were checked (e.g. respiratory, hemodynamic or neurological instability). If IMT could be applied, feasibility was evaluated regarding the number and type of protocol deviations.

Results: Out of 244 patients admitted to the ICU during the evaluation period, 64 patients (26.2%) fulfilled inclusion criteria for IMT. After following the contraindications in the protocol, 10 patients could be measured, of which 8 patients started the training (3.3%). Deviations in the measurements occurred in 75% of the cases, deviations in the training in 45%. Common reasons for protocol deviations were the wide-ranging margins of the measurements (which were not within 10% of each other), fatigue during the measurements and difficulty with progression of the training.

Conclusion: In the current ICU-setting in our hospital, the number of patients eligible for IMT is relatively low. Evaluation of the feasibility has led to adjustments in the IMT-protocol, allowing a more individual approach to the execution of the measurements and the progression of the training.

P32

Rehabilitation at the limits -are patients active whilst on Veno-Venous Extracorporeal Membrane Oxygenation (VV-ECMO)

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Aim:

1. To review prevalence of active rehabilitation whilst on VV-ECMO and the maximum level of daily mobility.
2. To review if adverse incidences occurred as a result of active rehabilitation.

Methods:

Design: Retrospective observational study.

Participants: Patients receiving VV-ECMO between 8th April 2015-1st June 2018.

Data collection: Notes were reviewed to determine active participation in rehabilitation; passive exercises or transfers were not included. Highest mobility level during physiotherapy sessions was recorded using the Intensive Care Unit Mobility Scale (ICU-MS), and adverse incidences noted.

Data analysis: Descriptive statistical analysis was completed.

Results: 234 patients received VV-ECMO. 16 (6.8%) received active rehabilitation. Of these, 14 (87.5%) were cannulated bi-femorally and 14 (87.5%) had a tracheostomy.

The rehabilitation cohort completed 267 physiotherapy sessions for 658 ECMO bed days. 160 (59.9%) sessions were active. 12 (75.0%) patients achieved Level 3 ICU-MS (actively sitting on edge of bed), 5 (31.2%) reached Level 4 (standing). 1 (6.3%) achieved Level 7 (walking with assistance of 2).

No severe adverse incidences occurred. Most frequent minor incidences were oozing from cannula site (n=13), SvO₂ (n=21) and SpO₂ (n=13) drop. All responded to simple interventions e.g. increase in inspired oxygen, and required no further treatment.

Conclusions: The number of patients participating in active rehabilitation was small. Reasons for this may be multi-factorial including patient stability, sedation levels and severity of illness. There were no serious adverse incidences, despite most patients being cannulated bi-femorally.

P33
Silverfit Flow System: Development of interactive games for training and optimization of respiratory muscle function

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Aim: Respiratory function may become severely impaired during stay in the intensive care unit (ICU) due to sepsis and ICU-acquired weakness. Also, wasting of respiratory muscle function occurs in many major illness processes. This may cause difficult breathing, atelectasis and respiratory insufficiency requiring ventilatory support.

Interactive training of respiratory muscle function using biofeedback may support respiratory functional recovery.

Methods: The games were developed using an iterative approach. Quantitative and qualitative feedback of nurses, physiotherapists and ICU patients was used in game optimization. Gaming goals were based on requirements in becoming independent of ventilatory support: Stimulating powerful breathing and stimulating effective cough. Silverfit focused on software development and Uscom provided the flowsensors.

Results: Two interactive games were developed, controlled by participants' respiratory flow. The first game, stimulating powerful breathing, requires deep inhalations collecting gems in an artificial mining environment. This game is driven by inspiratory tidal volume. The second game, stimulating effective cough, requires forceful exhalation throwing a spear in a prehistoric hunting game. This game is driven by maximum expiratory flow. Both games can be set at different levels of difficulty. Game scores are presented directly to the participants in a stimulating way and stored for further evaluation for the therapists. Both games proved feasible in ICU patients with and without tracheostomies. Most participants expressed enthusiasm while playing the games.

Conclusion: The Silverfit Flow system seems promising in expanding the range of options for respiratory therapy in the ICU and might add to enlarged motivation and training effort by participants.

Reference:

The Silverfit Flow system will be shown at the conference.

P34

Early mobilization of patients receiving vasoactive drugs in Critical Care Units; a review

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Background: Despite early mobilization is proven to be safe and feasible extended periods of bed rest are still common in ICU patients. The most commonly reported patient-related barriers of early mobilization are the presence of vasoactive drug support.

Aim: This review aimed to synthesize the recent evidence of mobilizing patients receiving vasoactive drugs, the relation between the dosage of vasoactive drugs and level of mobility, and the reported adverse events during mobilization.

Design: Review of studies published between 2010 and 2018

Method: A comprehensive literature search was conducted using various databases. The quality of the included articles was assessed using the Newcastle-Ottawa scale.

Results: Five-studies comprising of two prospective and three retrospective cohort studies were included in this review, representing a total of 528 participants. Participants included in this review were mechanically or non-mechanically ventilated patients admitted in a general, medical or surgical ICU.

Conclusion: The patients in critical care units on vasoactive drugs were mobilized safely irrespective of dose and diagnosis. The patients with a low dose of vasoactive drugs were more likely to be mobilized than those on a moderate and high dose. The decision to mobilize a patient receiving vasoactive drugs should depend on the clinical status of the patient at the time of the planned mobilization and the direction of trends in the past hours rather than the dose of vasoactive drugs. The criteria used to determine the eligibility and progression of mobilization of patients on vasoactive drugs were not consistent.

P35

Effectiveness of a Multidisciplinary Mobility Program on Early Ambulation in Cardiac Surgery Patients

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Background: Previously, in the Cardiothoracic Intensive Care Unit (CTICU) of Heart Hospital, the post-operative patients were ambulated after the chest tubes were removed. Furthermore, the patients were not mobilized after the regular physiotherapy working hours.

Objectives: To determine whether a multidisciplinary mobility program would increase the percentage of ambulated cardiac surgery patients within 24 hours after extubation to more than 90%. Secondary objective was to study the impact of program on the nurses led mobilization.

Methods: Quality improvement methodology “Model for Improvement” was adopted to implement this program. Fishbone diagram was used to examine the root causes of not ambulating the patients. The significant causes categorized using Pareto analysis. The project was implemented in March 2015. The interventions were development of “Levels of Activity and Mobilization”, formation of a multidisciplinary mobility team, initiating Physiotherapy referrals to all patients, implementing preoperative education program and “Patient Controlled Analgesia”, preparation of clinical protocol, and creating clinical indicators to disseminate the results. There were 1247 patients included from 2015 March until July 2019.

Results: In 2015, 82.3% of patients were ambulated within 24 hours after extubation from zero percent which gradually increased to 96% by July 2019. Nurses-led early mobilization increased to 89% compared to the zero percentage before the program.

Conclusion: A multidisciplinary early mobilization program can enhance the early ambulation of cardiac surgery patients and can boost the confidence of nursing staff in mobilizing them.

P36

Patients experience of occupation during early critical illness recovery.

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Aim: Patients report feeling helpless, dependent, vulnerable and dehumanised whilst on critical care, with no autonomy over their daily lives and difficulties completing basic occupations - “everyday activities that people do to occupy their time and bring meaning and purpose to life”. This study aimed to explore the experiences of occupation for people during early critical illness recovery.

Method: In-depth narrative interviews were completed utilising photo-elicitation, with four participants. Second interviews supplied greater depth. Inclusion criteria: critical care admission ≥ 7 days, English speaking, living within an hour of the researcher. Exclusion criteria: readmission to hospital, too unwell to participate, already discharged home or repatriated. Interviews were arranged within a month of hospital discharge.

Results: On waking, although fully dependent and unable physically to participate in occupations, they were not inactive. Much of their time was spent thinking: piecing together what happened, but also worrying about their usual occupations and roles, particularly work and family. They considered their dependence was permanent and started to adapt their future occupations. They needed support to participate in occupations gradually as they couldn't physically or cognitively initiate this. They found diversionary occupations beneficial; particularly personal-care improved their well-being and feeling of humanity.

Conclusion: Patients need time to adjust to loss of usual occupations and realistic expectations of recovery potential. The well-documented psychological outcomes of critical care may be related to these unaddressed worries. Diversionary occupations may benefit by reducing worry and improving overall wellbeing. Further research exploring occupation in early critical care recovery is warranted.

'This research was carried out in partial fulfilment of the requirements of obtaining the degree of the European Master of Science in Occupational Therapy.'

P37

The effects of External diaphragm pacing on central sleep apnea and hiccup after severe brain injury: case report

lei xu

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Aim: There is a high incidence of diaphragmatic dysfunction in patients with severe craniocerebral injury, with severe clinical consequences. This includes difficult weaning, central sleep apnea (CSA) and Hiccup.

Methods: case report. Using bedside ultrasound to assess diaphragmatic excursion and thickening-fraction for the diagnosis of CSA and Hiccup. In the work up patient was treated with external pace maker (EDP).

Results: We successfully treated CSA and hiccup in this patient with external diaphragm pacing.

Conclusion: This case demonstrates the importance of ultrasound in diagnosis and treatment of patients with diaphragmatic disorders. In addition, we demonstrate that EDP is a cheap and effective treatment for CSA and Hiccup. CSA and hiccup after severe craniocerebral injury are all special forms of diaphragmatic dysfunction. CSA may be aggravated by damage of the respiratory center, and Hiccup may be an electrical impulse resulting from excessive repair of the respiratory center. EDP can relieve CSA by inducing diaphragm contraction by electric pulse, or inhibit the excessive electrical impulse of respiratory center by negative feedback.

P38

Device-assisted early mobilization of low cognition hemorrhagic stroke patients with external ventricular drain

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Background: Mobilization is often challenging for patients with severe disorders of consciousness following hemorrhagic stroke with an external ventricular drain (EVD). This project data analyses the safety and feasibility of a protocol based early tilting in such a group of intensive care unit (ICU) patients and its effect on their arousal and awareness.

Methods: Eighteen patients with EVD, intubated or tracheostomized, without sedation and in a minimally conscious state, were incrementally mobilized by using a tilt table for a total of nine 1-hour sessions over a 3-week period. All variables were evaluated during a progressive tilting of 45°, 60°, and 80°. Baseline hemodynamic and neurophysiologic data were recorded for each patient. Glasgow coma scale (GCS) score was recorded before and after the tilting project.

Results: Fifteen patients completed the program. All mobility interventions were completed without any adverse events. Physiological parameters were within the prescribed range throughout. The time taken to mobilize reduced significantly from 14.7 (retrospective data) to 4.8 days ($P<0.005$) and the baseline GCS score, which was 3.4(T) (\pm SD 0.8) were improved by 4.2 points (\pm SD 1.8) ($P<0.005$).

Conclusion: A protocol based early mobilization using a tilt table for hemorrhagic stroke patients with low cognition is safe and feasible. A strong positive trend of improved level of consciousness without deleterious physiological effects was another finding. A significant reduction in first time mobilization was achieved during this mission. Further quality trails are warranted to ascertain these findings.

Keywords: Early mobilization, tilt table, hemorrhagic stroke

P39

Effect of DVT compression pumps in orthostatic intolerance during early tilt table mobilization of stroke patients admitted in ICU

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Introduction: Hemorrhagic stroke patients with low levels of consciousness often require incremental tilting. Orthostatic intolerance is a common adverse event to early verticalisation. This project analyzed whether the application of DVT compression pump and stockings during tilting has an effect on orthostatic intolerance.

Methods: Fifteen hemodynamically stable stroke patients, either intubated or tracheostomized were included in this program. The baseline mean Glasgow coma scale was 3.9T (\pm SD 0.84) for a length of stay of 4.6 (\pm SD 1.28). Change in blood pressure, heart rate and oxygen saturations were monitored for analysis. Patients were then progressively tilted to 30°, 60°, and 80°. The total time in 80° tilt position in a 30-minute session was calculated as the total orthostatic tolerance time. The patients were then given a 10-minute rest followed by another 30 minute session of verticalisation, but this time with DVT compression stockings attached to the legs.

Results: There was a marginal increase in the total tilting time in the second session, which was not statistically significant ($P=$. 47). A positive trend towards early recovery to baseline systolic blood pressure once the patient was lowered to supine after an event of orthostatic hypotension was noted during the second session.

Conclusion: This analysis didn't demonstrate any statistically significant improvement in orthostatic intolerance, but plotted a positive trend when a DVT compression pump was incorporated in tilting. This, along with recorded early systolic blood pressure recovery is leaving the potential for further quality trials in this field.

Key words: Hemorrhagic stroke, orthostatic intolerance, tilt table, compression pumps

P40

Physical therapy practice in Qatar intensive care units

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Background: Service of physical therapists in intensive care units is plotted positively in the recent researches and acute care clinical practice guidelines. An analysis of practice patterns in the acute care hospitals in Qatar might be useful to find out the physical therapy practice in the intensive care unit.

Methodology: A survey questionnaire which was content validated were made available in hard copy. Physical therapists who work in ICUs of the country's major acute care hospital was identified and invited to participate.

Results. Survey response rate was 86.7%. Patient evaluation performed 'very often' included ICU chart review (92.3%), level of mobility (92.3%), cough effort (84.6%) and chest auscultation (69.2%). Treatment techniques performed 'very often' included manual chest clearance (92.3%), bed mobility and positioning (76.9%; 84.6%, respectively), out-of-bed mobilization (84.6%), deep breathing exercises (92.3%), peripheral muscle-strengthening exercises (84.6%) and incentive spirometry (76.9%). It was noted that respondents scored less in suctioning (38.5%), extubation process (30.8%) and adjustment of MV settings (15.4%).

Conclusion: The care provided by physical therapists to adult patients in ICU of major hospital in Qatar consists mostly of early mobilization, functional adaptation, thoracic expansion and chest physical therapy. This is almost identical to the international reports and audits in the fields of intensive care rehabilitation. Future exploration in areas like weaning of patients, use of clinical practice guidelines, functional outcome measures and evidence based pulmonary hygiene measures can improve the practice standard further.

Key words: Intensive care; physical therapy

P41

Preliminary results of the First dedicated Dutch ICU for complex weaning from mechanical ventilation

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Aim: Weaning from mechanical ventilation (MV) is prolonged (>7 days) in 8.7% of all ICU patients. In January 2016, the first specialized ICU for patients with complex weaning from MV in the Netherlands was opened (Radboudumc Centre of Expertise for Weaning from MV) aiming to improve outcome with a better cost efficiency.

Methods: We use a multidisciplinary approach including a dedicated team of ICU nurses, physiotherapists, speech therapists, intensivists, a technical physician, and if indicated other consultants. If indicated, patients receive hydrotherapy. Patients with difficult or prolonged weaning are eligible for admission (team decision). Descriptive analysis of the first cohort, 3-month outcome data, derived from MONITOR-IC study, and survival data are reported.

Results: From January 2016 to November 2017, 109 patients were admitted. Median duration of MV before admission was 19 days [IQR 12-25]. 61% suffered from delirium, 41% from anxiety, 39% from sleep disturbances. 79% were weaned successfully. Median length of stay in our unit was 11 days [IQR 6-20]. Dysphagia was observed frequently resulting in prolonged admission. Clinical frailty score was increased with 3.5 [3-5.25] (median [IQR]) before admission, 6.0 [5.5-7] at discharge and improved moderately after 3 months (5.0 [4-6]). Quality of life was comparable in between preadmission and after 3 months (PCS 30 [21-44] and 27 [22-37], MCS 49 [32-54] and 48 [37-58]). Survival was 22±1 months (mean±SE).

Conclusions: Patients treated at a new dedicated ICU for complex weaning from MV in the Netherlands have a high rate of successful weaning. Patients were vulnerable before admission with increase of frailty at discharge improving modestly after 3 months, while mental health was comparable to before admission. Long-term survival in this population was reasonable.

P42

Can 7-day Chelsea Critical Physical Assessment tool (CPAx) scores determine the need for a tracheostomy in Cardiothoracic Intensive Care Unit (ICU)?

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Introduction: The Chelsea Critical Care Physical Assessment Tool (CPAx) is a validated measure of physical function in the Intensive Care Unit (ICU). Grading patients in ten components of function, scoring 0-50. Previous research indicated that a median CPax score of <10 in the first five days of ICU stay is associated with longer ICU length of stay (LOS) >10/7 and increased duration of advanced respiratory support.

Objective: To determine whether CPax scores in the first week of ICU admission are associated with the need for a tracheostomy.

Methods: Retrospective observational study, patients admitted to an adult cardiothoracic ICU 09/18—1/19. Data: age, gender, APACHE-II score, diagnosis, mortality, LOS, days of mechanical ventilation, tracheostomy insertion, CPax scores within 1/52. Data was analysed descriptively.

Inclusion criteria: age ≥18years, ICU LOS of ≥48hours.

Exclusion criteria: no outcome recorded (n=6), inadequate data (n=4).

Results: N=52. Median age=58 years, average APACHE-II scores=20.9, median of 11 days mechanical ventilation. 42.3% underwent a tracheostomy after a median of 15 days. Tracheostomy was associated with longer mechanical ventilation, ICU and hospital LOS, not survival. Patients requiring a tracheostomy scored a median CPax score=1 in the first 7-days, those who didn't scored=9.

Conclusion: A CPax score of ≤6 in the first week of admission to cardiothoracic ICU is associated with a two-fold increase in the need for a tracheostomy. Suggesting physical function, measured by CPax, may be valuable when deciding whether to perform a tracheostomy/considering early tracheostomy. Further large-scale studies are required. Limitations; the retrospective nature of this study.

P43

Physiotherapy management of adults with cystic fibrosis admitted as an emergency to intensive care (ICU)

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Objective: With improved life expectancy of patients with cystic fibrosis (CF), as well as advances in extra corporal life support (ECMO), patients with end stage or exacerbations of CF can be admitted to intensive care for mechanical support. Physiotherapy is an integral part of the management to facilitate airway clearance and maintain physical function.

Our aim was to review the physiotherapy management of patients with CF admitted to ICU.

Method: Retrospective review via electronic patient records of consecutive pre- transplants patients admitted between January 2016 to December 2018.

Results: 11 patients required an emergency admission to ICU in the timeframe. 91% (n=10) were admitted due to respiratory failure. 100% received twice daily respiratory physiotherapy, with 2 patients receiving three times a day input. Session ranged from 30-60minutes each. 81.8% of these patients required evening airway clearance session. Manual techniques (81%) and positive pressure (64%) were the most commonly used techniques. 100% needed nebulised treatments which had to be timed around physiotherapy.

Active exercise occurred in patients who were medically appropriate (n=7, 63.6%). No serious adverse events were recorded during any physiotherapy session.

4 patients died whilst on ICU, 4 survived post-transplant whilst three returned to their usual ward.

Conclusion: CF patients admitted to intensive care have high physiotherapy needs and require multiple sessions daily. Multidisciplinary communication is essential to plan their care. Physiotherapy for these patients is time intensive but physiotherapy management principles remain the same despite being in ICU.

P44

Questionnaires to assess facilitators and barriers of early mobilization in critically ill patients: a systematic review

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Aim: Evidence and recognition of the benefits of early mobilization of critically ill patients is growing. Early mobilization is an intensive, complex process that requires multidisciplinary input and cooperation. To gain insight in the facilitators and barriers (F&B) of early mobilization in critically ill patients, various surveys have been developed. To find a questionnaire which is suitable to assess F&B in critically ill *burn* patients specifically, the aim of this study is to identify and compare the different, existing questionnaires.

Methods: A systematic review was conducted, based on the PRISMA statement. Publications were included if they presented a questionnaire to assess F&B of early mobilization in an ICU and the questionnaire had to be available. Data were extracted regarding o.a. general characteristics, development (testing, validity and reliability), content and themes, question format and type of ICU.

Results: The search identified 537 publications. Screening of titles and abstracts resulted in 35 potentially suitable questionnaires. For data extraction, 13 unique questionnaires were included. The questionnaires showed great variation regarding development, moreover only five questionnaires assessed validity and reliability. Content, themes and what constitutes early mobilization were not unambiguous in the different questionnaires.

Conclusion: There is a large variation between the various questionnaires. No questionnaire was found to assess F&B specifically in critically ill *burn* patients. Nevertheless, one questionnaire was found most suitable, but will require some burn specific adaptations.

P45

Cycling with Functional Electrical Stimulation (FES) in septic critically ill patients - a summary of feasibility outcomes at the half-way stage of recruitment

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Aim: For 8 months, we have performed a single centre, unblinded randomised control trial, comparing daily passive supine cycling with Functional Electrical Stimulation (FES) against routine physiotherapy. At the half way point in the study, we aim to present early feasibility outcomes, and what can be learnt when designing such studies.

Methods: Septic mechanically ventilated patients were recruited to this study. They were randomised to daily cycling with FES, or routine physiotherapy, aiming for 10 sessions in 14 days. A cycling session lasted for a maximum of 30 minutes, with a “successful” session lasting 20 minutes. A patient leaves the study when they reach day 14, leave the intensive care unit, refuses further participation, or dies.

Results: From 100 patients screened, 20 patients have been recruited (under the recruitment target of 24 at 8 months) with 9 allocated to the cycling group. The median time spent in the study is 7 days, with 7 patients (35%) reaching day 14. A median of 4 cycling sessions have been conducted per patient, with only one patient (5%) achieving all 10 sessions. In total, 44 sessions have been performed, of which 4 (9.09%) were stopped prematurely. There have been no dislodgements of indwelling tubes, lines or catheters, but stimulation of the abdominal wall interferes with the ECG signal.

Conclusions: FES sessions are safe and the majority successful. The short length of stay due to discharge from intensive care, death or withdrawal must be accounted for when designing future physical intervention studies.

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You will also have an opportunity to try the increasingly popular mechanical POWERbreathe Medic and Medic Plus (RMT/ IMT) trainers, together with the NEW POWERbreathe Shaker expiratory (PEP) mucus clearance devices including Shaker Classic, Shaker Deluxe, Shaker Medic Plus for respiratory care and breathing physiotherapy.

Our product specialists from Netherlands and United Kingdom will be happy to meet you at their booth and share more information about POWERbreathe and its production with you.

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Vivisol Nederland



VIVISOL provides (homecare) therapy management services by supplying technological devices and treatment to over 130,000 people throughout Europe daily. We specialise in respiratory care. In particular oxygen therapy, diagnosis, obstructive sleep apnoea syndrome, telemedicine and mechanical ventilation.

Ventilation therapy

Managing chronic illness has become a critical point for society because of its high social and economic impact. Over the years VIVISOL has used the best technologies for mechanical ventilation and technologies to optimize mechanical ventilation, such as transcutaneous PCO₂ monitoring and mechanical insufflation-exsufflation therapy.

Transcutaneous PCO₂ monitoring

Arterial Blood Gas analysis are painful and invasive. It only provides a snapshot of the ventilatory status and it lacks information regarding the dynamic evolution of alveolar ventilation. Transcutaneous CO₂ monitoring with SenTec Digital Monitor (SDM) is an effective way of providing continuous, non-invasive monitoring of changes in alveolar ventilation.

SDM can be used to continuously monitor spontaneous breathing trials in prolonged weaning. SenTec's continuous transcutaneous monitoring system helps to immediately detect early changes in PaCO₂. This enables a rapid response to increasing exhaustion of the respiratory muscles and adjustment of the NIV setting.

Mechanical insufflation/exsufflation therapy

Philips Cough Assist provides non-invasive loosening and clearing of retained bronchial secretions, for patients who are unable to cough or clear secretions effectively.

Patients suffering from i.e. neuro muscular diseases exhibit weak cough and are susceptible to recurrent chest infections, a major cause of morbidity and mortality. Mechanical insufflation/exsufflation improves cough efficacy by increasing expiratory peak flow.

More information

For more information please contact us via sales@vivisol.nl.

Silver sponsors:

Getinge Netherlands B.V.



With a firm belief that every person and community should have access to the best possible care, Getinge provides hospitals and life science institutions with products and solutions aiming to improve clinical results and optimize workflows. The offering includes products and solutions for intensive care, cardiovascular procedures, operating rooms, sterile reprocessing and life science. Getinge employs over 10,000 people worldwide and the products are sold in more than 135 countries.

During a trauma, every second counts. As time is of the essence, clinical professionals need the right acute care therapies. We develop advanced clinical solutions that can help improve patient outcomes and enhance quality of life. In people's most vulnerable moments, we are by your side every step of the way, working together as one.

Our goal is to help keep your adult, pediatric and neonatal patients as safe and comfortable as possible with easy to use, easy to apply ventilation. The SERVO-U/n ventilator offers Edi signal, Pes & PL measurement, Auto Stepwise Recruitment Maneuver, AUTOMODE and (NIV) NAVA ventilation and many more measurements and ventilation strategies, you can have patient comfort with less sedation, an active diaphragm, which helps you to promote early weaning.

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