

Beyond BASIC Mechanical Ventilation

BASIC collaboration and education in ICU

- Ross Freebairn, Hawke's Bay NZ



Ross Freebairn Declaration of Interest.

- Hawke's Bay Hospital, Hastings New Zealand
 - Intensive Care Consultant .
- University Of Otago, New Zealand
 - Associate Dean, (HB) School Of Medicine
- Chinese University of Hong Kong, Shatin, HK, China
 - Adjunct Associate Professor, Anaesthesia & Intensive Care
- NZ Air Ambulance Service
 - Medical Director.
- Chair, BASIC Collaboration

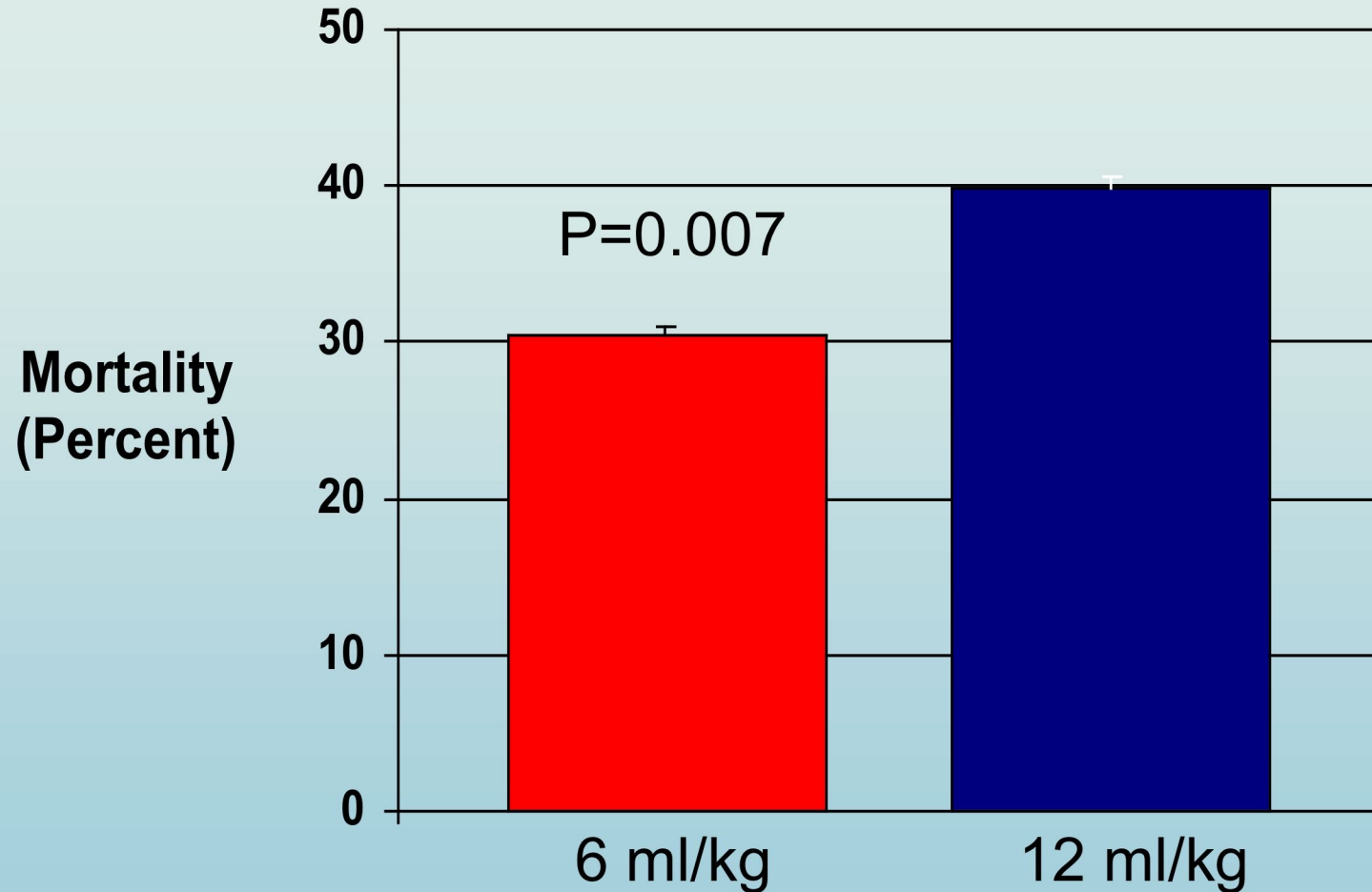
An ICU Bed

- A physical bed in a well appointed environment
 - Gas / electrical / air exchanges / lighting/ temperature controlled ✘
- Equipment ✓
 - Ventilator/ Syringe Pumps / Monitors/ Dialysis
 - Appropriate standard
- Staffing
 - Nurses/ Doctors/ Allied Health
 - Trained and experienced

Back to the future

ARDSnet Mortality

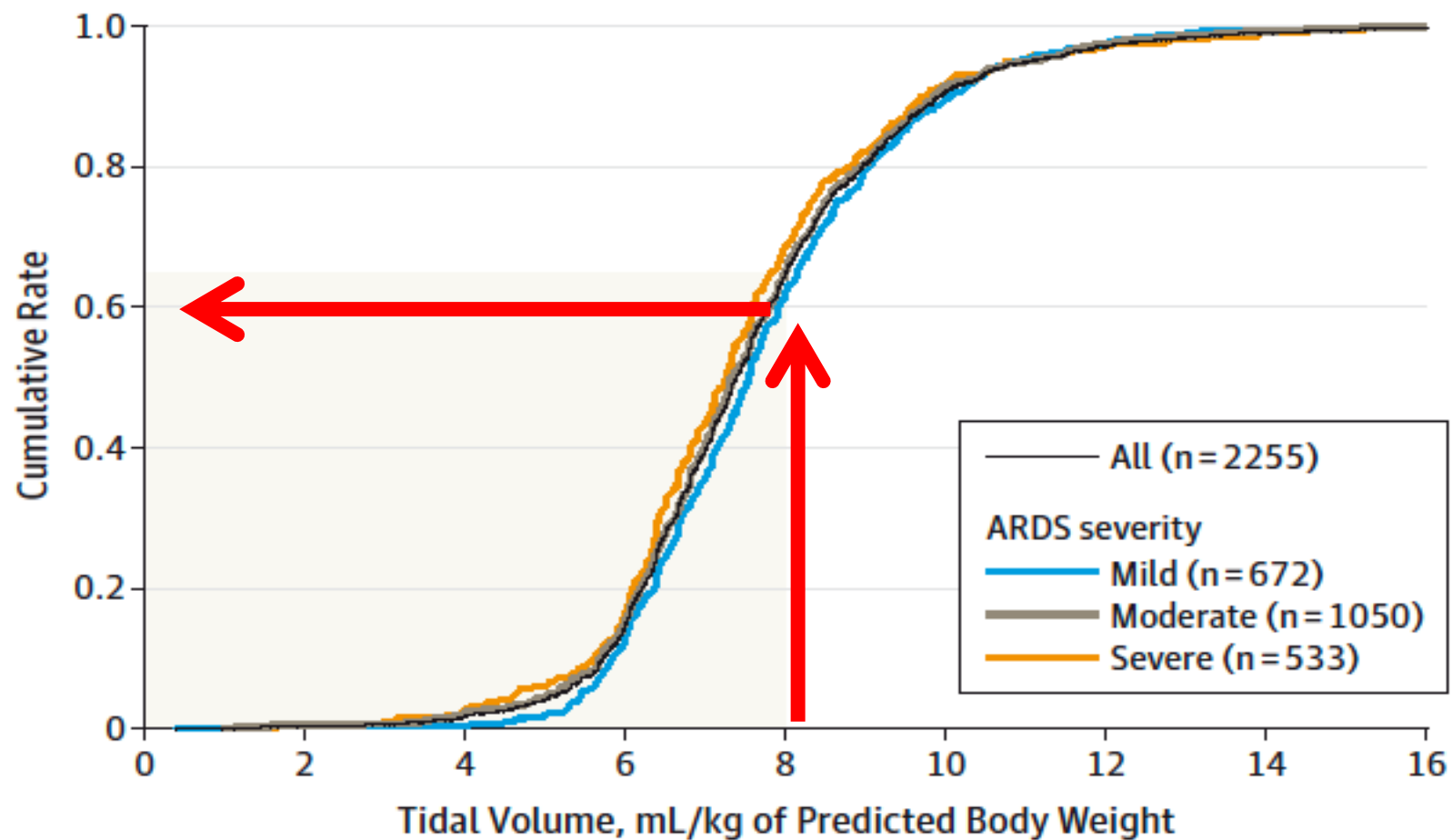
Prior to Hospital Discharge



Epidemiology, Patterns of Care, and Mortality for Patients With Acute Respiratory Distress Syndrome in Intensive Care Units in 50 Countries

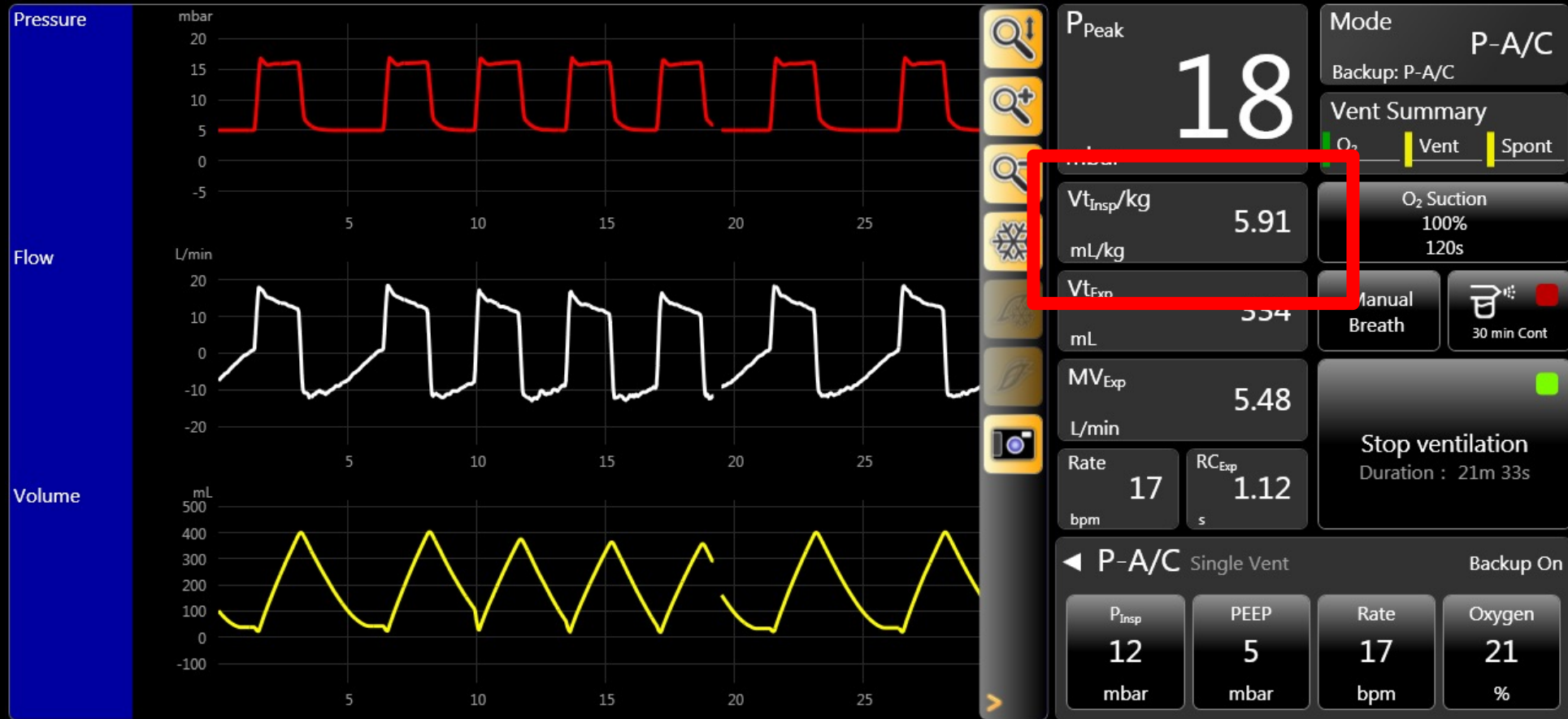
Giacomo Bellani, MD, PhD; John G. Laffey, MD, MA; TÀI Pham, MD; Eddy Fan, MD, PhD; Laurent Brochard, MD, HDR; Andres Esteban, MD, PhD; Luciano Gattinoni, MD, FRCP; Frank van Haren, MD, PhD; Anders Larsson, MD, PhD; Daniel F. McAuley, MD, PhD; Marco Ranieri, MD; Gordon Rubenfeld, MD, MSc; B. Taylor Thompson, MD, PhD; Hermann Wrigge, MD, PhD; Arthur S. Slutsky, MD, MASc; Antonio Pesenti, MD;

A Cumulative frequency distribution of tidal volume



• BEL

Quality Ventilation



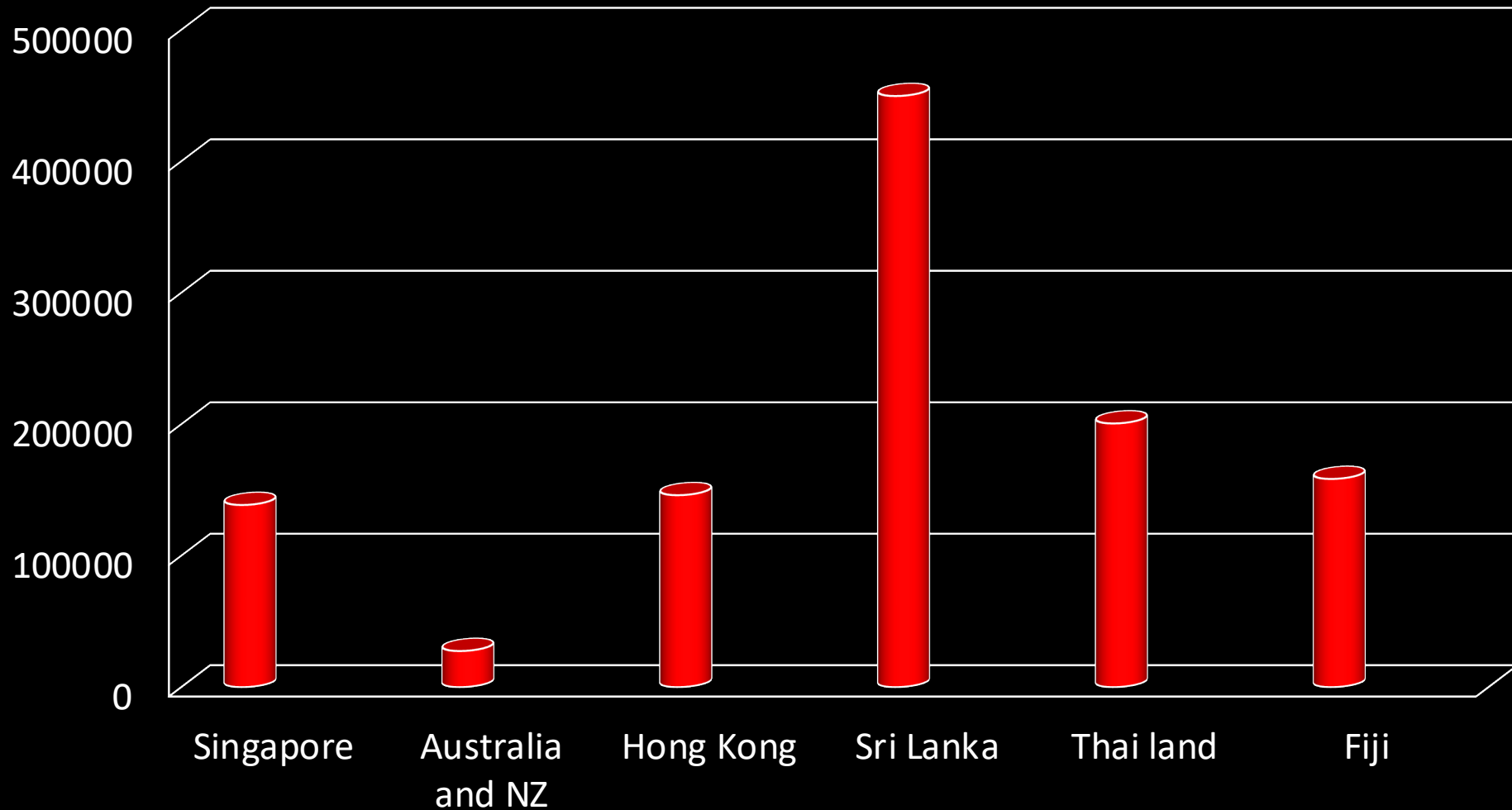
- None of the proposals for “protective ventilation” require expensive pharmaceutical intervention or other capital expenditure
 - Knowing what to do
 - Doing it consistently
- EDUCATION

Primitive Intensive care Ca

- Opinionated
- Self reliant
- Good with “tools”
- Poorly trained
- Self assessed
- Idiosyncratic



Population size served by Intensive Care Medicine Specialist of : 2017



Management of severe sepsis in patients admitted to Asian intensive care units: prospective cohort study

Jason Phua, consultant,¹ Younsuck Koh, professor,² Bin Du, professor,³ Yao-Qing Tang, professor,⁴ Jigeeshu V Divatia, professor,⁵ Cheng Cheng Tan, consultant,⁶ Charles D Gomersall, professor,⁷ Mohammad Omar Faruq, professor,⁸ Babu Raja Shrestha, consultant,⁹ Nguyen Gia Binh, consultant,¹⁰ Yaseen M Arabi, associate professor,¹¹ Nawal Salahuddin, associate professor,¹² Bambang Wahyuprajitno, consultant,¹³ Mei-Lien Tu, respiratory therapist,¹⁴ Ahmad Yazid Haji Abd Wahab, consultant,¹⁵ Akmal A Hameed, consultant,¹⁶ Masaji Nishimura, professor,¹⁷ Mark Procyshyn, respiratory therapist,¹⁸ Yiong Huak Chan, biostatistician¹⁹ for the MOSAICS Study Group

BMJ 2011;342:d3245

Characteristic	No (%) of ICUs	No (%) of patients	Compliance with entire resuscitation bundle*		Hospital mortality (%)	
			%	P value†	%	P value†
No of intensivists‡:						
0-3	58 (38.7)	501 (39.0)	8.4%	0.55	47.7%	0.18
4-6	42 (28.0)	340 (26.5)	7.9%		42.4%	
≥7	50 (33.3)	444 (34.6)	6.5%		42.6%	
Intensivist cover:						
No 24 hour cover	51 (34.0)	429 (33.4)	8.4%	0.46	46.4%	0.34
24 hour cover	99 (66.0)	856 (66.6)	7.2%		43.6%	
Nurse-to-bed ratio in each shift:						
1 nurse:≥3 beds	25 (16.7)	161 (12.5)	8.1%	0.27	41.0%	0.28
1 nurse:2 beds	65 (43.3)	674 (52.5)	8.6%		43.5%	
≥1 nurse:1 bed	60 (40.0)	450 (35.0)	6.0%		47.3%	
ICU fellowship programme:						
No accredited programme	58 (38.7)	426 (33.2)	5.2%	0.019	50.0%	0.005
Accredited programme	92 (61.3)	859 (66.8)	8.8%		41.8%	

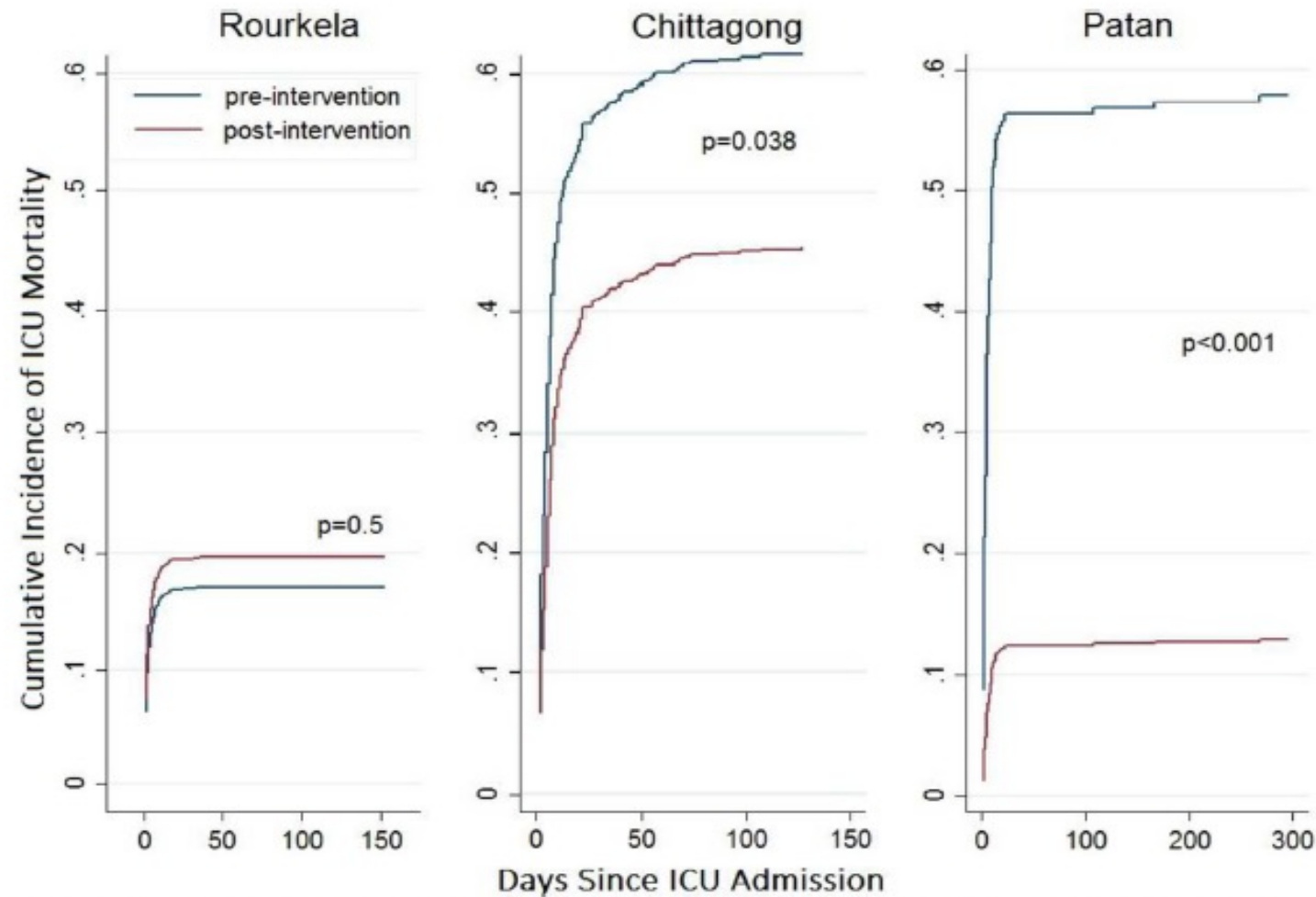


Fig 2. Cumulative incidence function for ICU mortality in the three study sites. P-values refer to the evidence for stepwise changes in adjusted subdistribution hazard ratio from the Fine-Gray model for the cumulative incidence of ICU mortality.

<https://doi.org/10.1371/journal.pone.0173483.g002>



Basic Assessment & Support in Intensive Care (BASIC)



Charles Gomersall, FJFICM, Gavin Joynt, FJFICM, Florence Yap, FJFICM, Claudia Cheng, FJFICM, Philip Lam, FHKCP, Gordon Choi, FJFICM, The Chinese University of Hong Kong, Hong Kong. Richard Leonard, FJFICM, St Mary's Hospital, London, England. Ross Freebairn, FJFICM, Hawke's Bay Hospital, New Zealand. John Torrance, FJFICM, Waikato Hospital, Hamilton, New Zealand Sarah Ramsay, FRCA, Western Infirmary, Glasgow, Scotland. Peggy Tan, FJFICM, Tuen Mun Hospital, Hong Kong. Jeff Lipman, FJFICM University of Queensland, Australia. Tom Buckley, FJFICM, Princess Margaret Hospital, Hong Kong

Education is not the learning
of facts but the training of
the mind to think.

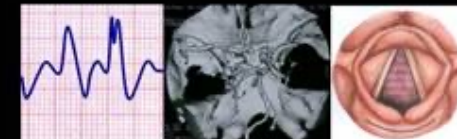
Albert Einstein

BASIC collaboration



- An informal grouping of ICM specialists with an interest in the development and dissemination of teaching material.
- material mainly short courses focusing
 - on different topics
 - or groups of students/professionals working with severely ill patients.
- All material is provided free of charge (in an electronic format) to appropriately trained professionals who wish to run courses.

*Basic
Assessment &
Support in
Intensive
Care*



BASIC , the COVID response and education



- BASIC started in 2004, after the SARS pandemic ,
 - Aimed as introduction course to ICU,
 - Original courses in HK, NZ Australia Indonesia Malaysia UK .
- Running about 200 courses a year (2019) plus other “ BASIC collaboration” courses
- In over 50 Countries
- Aimed as an introduction, to help clinicians develop the knowledge, skills and attitudes to recognize and manage critically ill patients
 - Initial management only

During Lockdown, used mainly e-lectures ,

- Social distancing and maintenance of other isolation processes were challenging. Minimised contact time.

BASIC collaboration



- Opportunity to deliver education
 - Context specific
 - Cost effective
 - Locally deliverable
 - Resource appropriate
 - Practice based training & assessment

- Locally sustainable !!!
- Internationally accepted

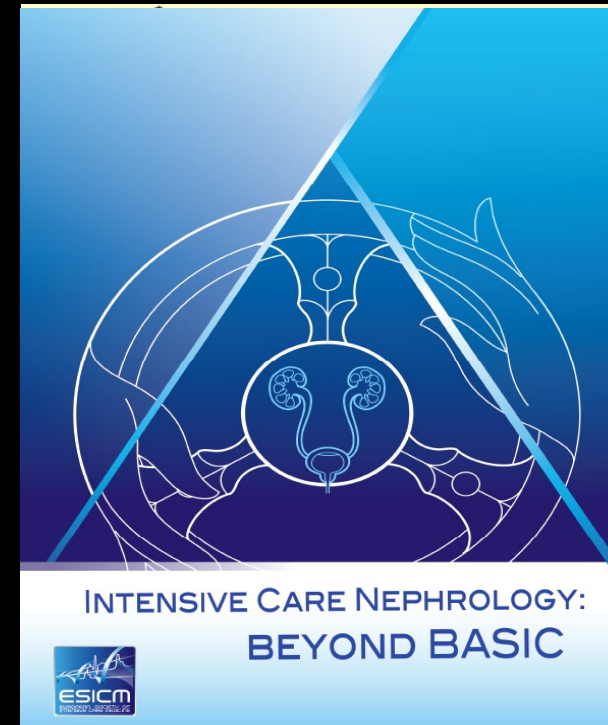
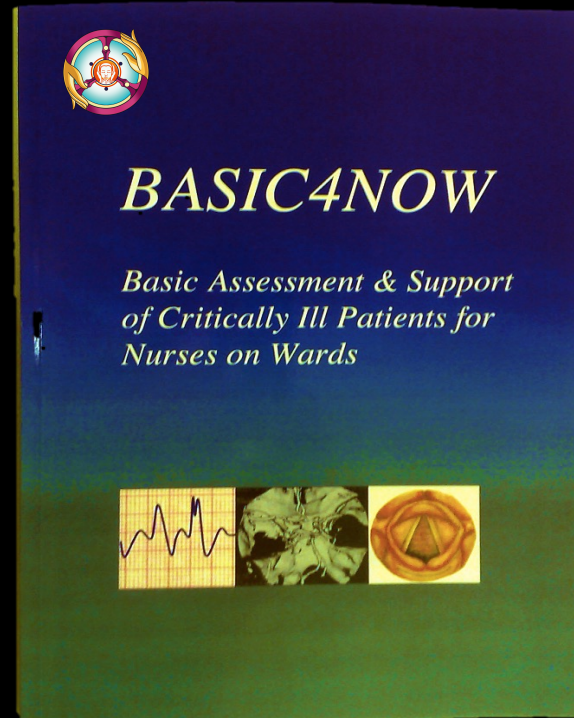
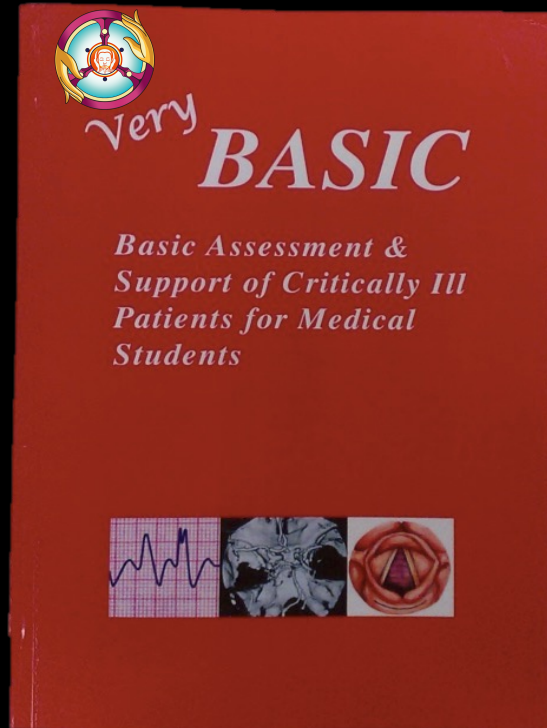
About BASIC

- 2-3 day course
- *Introduction* to Intensive Care
 - What does a trainee/ clinician need to know in the first few weeks?
- One way to manage not *the* way to manage

About BASIC

- In order to keep things simple the content is sometimes only an approximation of the truth
- Less is more

“BASIC” courses



Mechanical Ventilation: beyond BASIC

Authors
Charles Gomersall, Gavin Joynt, Shannon Tang, Michael C. Reade, Ross Freebairn.



BASIC DHS

A summary of individual courses is given in the table below.

Name	Target audience	Content
BASIC	Novice intensive care doctors	Introduction to intensive care with a focus on resuscitation and organ support, especially mechanical ventilation
BASIC for Nurses	Novice intensive care nurses	Introduction to intensive care with a focus on resuscitation and organ support, especially mechanical ventilation
Paediatric BASIC	Novices PICU doctors	Introduction to PICU with a focus on monitoring and organ support, especially mechanical ventilation
BASIC Patient Safety	Bedside clinicians ♦ (medical and nursing)	Patient Safety concepts with an emphasis on how clinicians can improve Patient Safety
Very BASIC	Medical students and junior doctors	Care of critically ill patients outside ICU
BASIC Low Resource (BASIC LR)	Doctors working in low resource settings	Care of critically ill patients in low resource settings. Developed at the request of and in collaboration with Medecins sans Frontieres, Paris.
BASIC LR for Nurses	Nurses working in low resource settings	Nursing care of critically ill patients in low resource settings. Developed at the request of and in collaboration with Medecins sans Frontieres, Paris.
BASIC Sciences	Intensive care trainees	Basic sciences underlying Intensive Care (course material in development)
Beyond BASIC Cardio-cerebral Resuscitation	Doctors involved in cardiac resuscitation	Advanced cardiac life support
Beyond BASIC Mechanical Ventilation	Intermediate-advanced Intensive Care trainees ♦♦ (or refresher for specialists)	Mechanical ventilation of critically ill patients
Beyond BASIC Intensive Care Nephrology	Intermediate-advanced Intensive Care trainees ♦ ♦(or refresher for specialists)	Nephrology relevant to Intensive Care, including renal replacement therapy
Beyond BASIC Airway Management	Intermediate-advanced Intensive Care trainees ♦♦ (or refresher for specialists)	Airway management in the critically ill including use of advanced airway techniques
Beyond BASIC Cardiothoracic Intensive Care	Intermediate-advanced Intensive Care trainees ♦♦ (or refresher for specialists)	Management of immediate post operative and critically ill cardiothoracic patients
BASIC Transthoracic Echocardiography	Doctors and healthcare workers interested in learning basic Focused Cardiac Ultrasound. No prior experience required.	

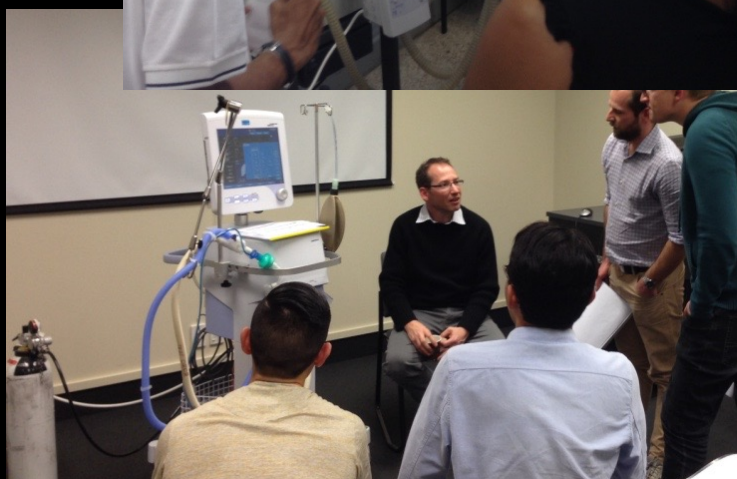
BASIC Course Worldwide Sites 2020



BASIC Collaboration Courses Annually > 350 (2020)

Worldwide BASIC by 2021

	Number of Courses	Number of Candidates
BASIC	2290	58015
BASIC for Nurses	444	15587
MV	128	2396
Nephrology	77	1585
Airway	64	939
Paeds BASIC	284	6144
Total	3287	84666



Skill stations

- Aim of course is to train participants to look after patients
- Knowledge transfer is necessary but not sufficient
- Participants must be able to apply knowledge

Skill stations

- Opportunity for participants to apply knowledge
- Opportunity for instructors to assess understanding
- Participants need to do/talk

Skill stations

- You should be speaking for $\leq 1/4$ of the time

- You should be speaking for $\leq 1/4$ of the time

Involve all

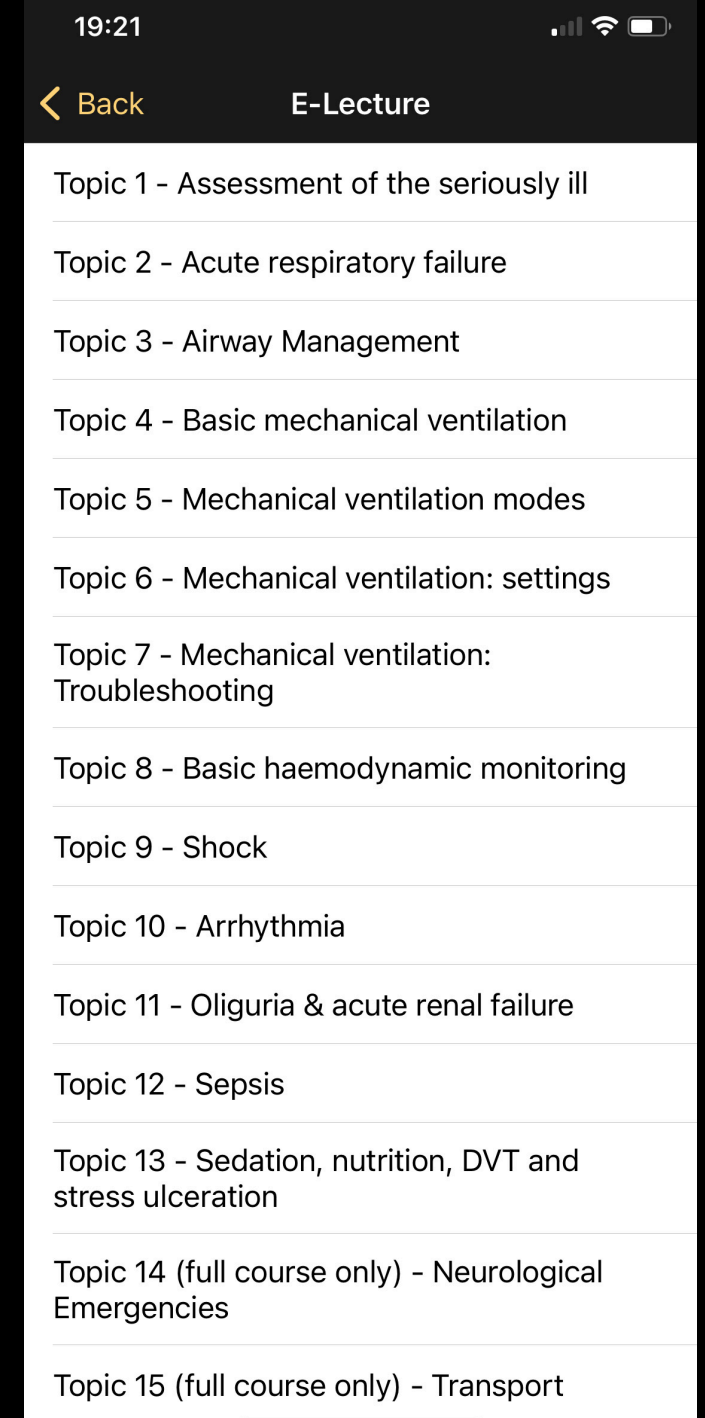
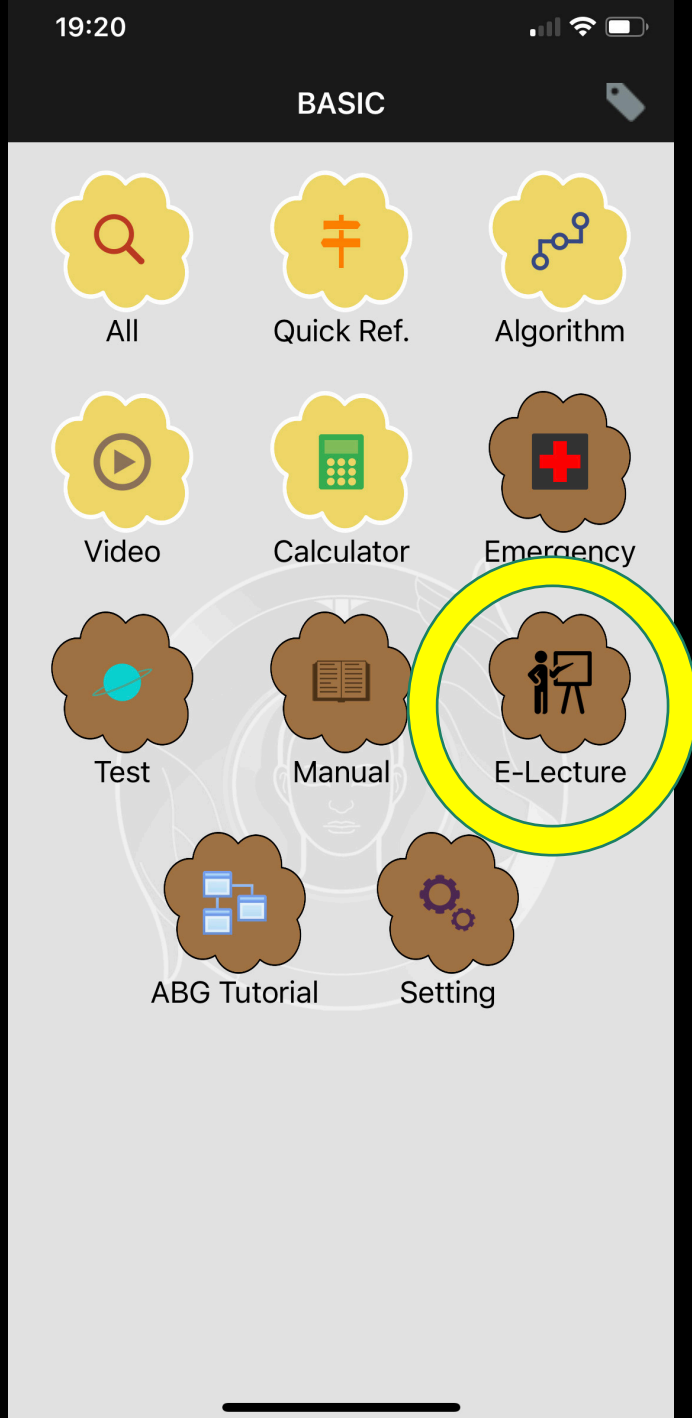
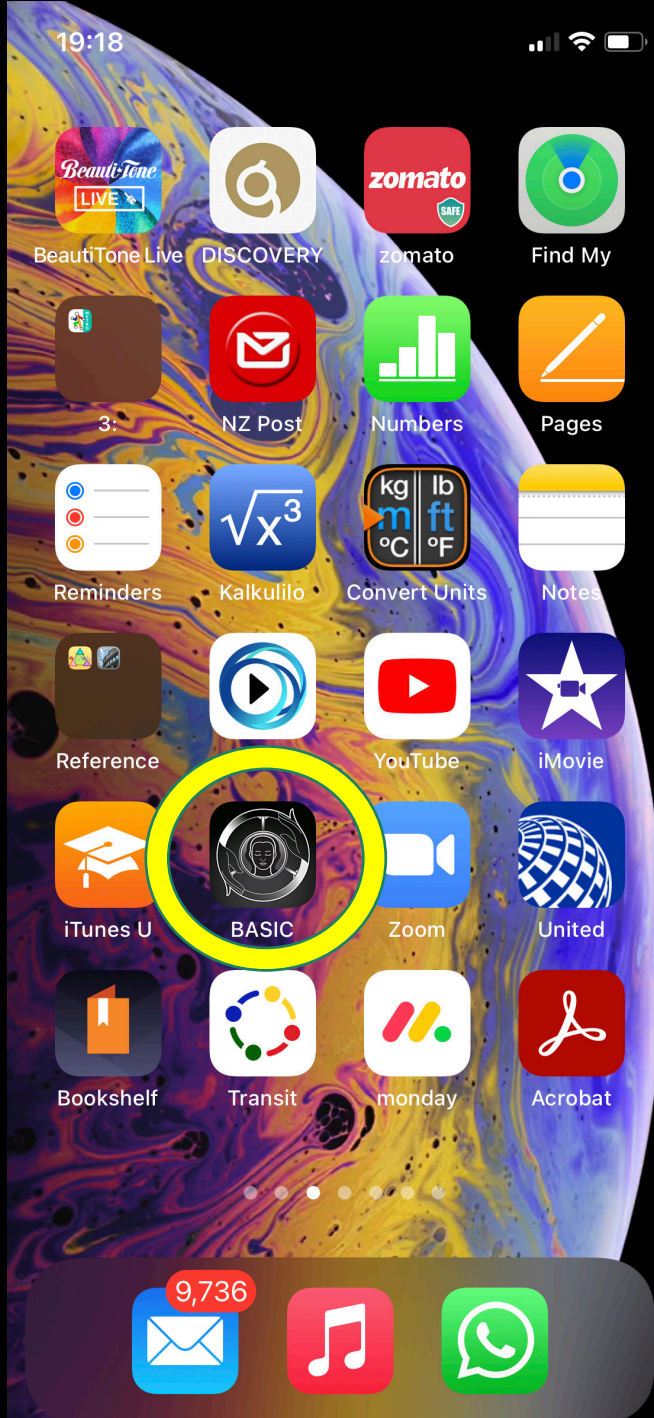
- Do not allow one person to dominate
- Involve the non-contributor
- Get the group to assist/correct
 - Can you help your friend?
- Check understanding
 - Is he right? Why?

Allow mistakes

- Encourage answers even if unsure
- Allow simulations to run uninterrupted until there is enough to discuss.
 - Students should do, not talk.

Summary

- Skill stations should be interactive





BASIC Medical online

- Numerous courses: pre reading, pre-course test, e –lectures, online skill stations, post course test.
- Multiple countries (World wide)
 - Time zones
 - Logistics
 - Language
 - PRE READING and preparation are essential (and often missed)

Cost

- There are no license fees for *running* BASIC.
- Course material is supplied in an electronic format.
- Course manuals can be printed locally from the supplied pdf (colour printing is recommended) or supplied at cost (approximately US\$3 per book plus shipping).
- Registration fees for candidates vary from course to course depending on venue costs and degree of subsidy.
- Course set up will require instructors to be trained



Increased Accessibility

iOS 7

The mobile OS from a whole new perspective.

[Watch the keynote](#) 

[Learn more](#) >



Main menu

 [Site news](#)

Screenshot

Department of Anaesthesia & Intensive Care
The Chinese University of Hong Kong



Intensive Care E-learning

Courses

[▼ Collapse all](#)

▼ Acute care training

 [BASIC LR Severe Acute Respiratory Infection](#)

[→](#) [i](#)

 [Acute care for obstetricians](#)

 [Advanced cardiac life support for students](#)

[🔍](#) [i](#)

 [BASIC DHS](#)

[🔍](#) [i](#)

▼ Basic Intensive Care training

 [On-line BASIC for COVID](#)

[→](#) [i](#)

 [Intern training](#)

 [e-BASIC](#)


[🔍](#) [🔍](#) [i](#)

 [BASIC for instructors](#)

[🔍](#) [🔍](#) [i](#)

 [e-BASIC for Nurses](#)

[i](#)

 [BASIC plus](#)

[🔍](#) [🔍](#) [i](#)

 [Basic Sciences for Intensive Care](#)

[→](#) [i](#)

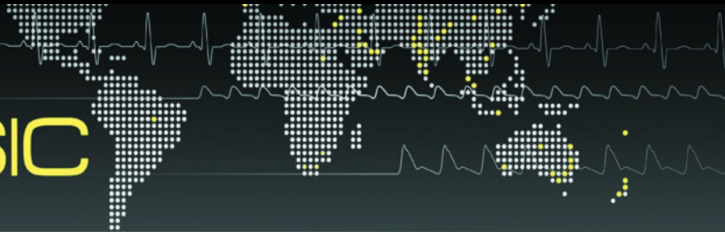
▼ Advanced Intensive Care training

 [Mechanical ventilation for Nurses](#)

[i](#)



BASIC



DATES & VENUES

APP AND LESSONS **NEW**

FAQ

COURSE MATERIAL

ORDER BOOKS

COURSE ADMIN

STUDENT ADMIN

INSTRUCTOR ADMIN

APP ONLY ACCOUNT
ADMIN

VIEW FEEDBACK

VIEW LESSONS ATTEND

VIEW PRE-COURSE TEST

VIEW POST-COURSE TEST

INPUT POST-COURSE TEST

MY ACCOUNT

LOGOUT

Welcome to BASIC Course Administration Page

 [Guideline to use the website](#)

[REDACTED]
BASICS course in April

To: Ross Freebairn <ross.freebairn@xtra.co.nz>, Cc: [REDACTED]@ccdhb.org.nz, [REDACTED]@ccdhb.org.nz

Dear Ross

If you have already cancelled the BASIC course in April, please ignore this e-mail; if not, please read.

I am surprised and disappointed by the e-mail to registered attendants to the BASIC course on 6th April and the expectation that the course (even though in a modified version) is planned to proceed. I simply cannot see how this can be covered under essential travel during a nationwide lockdown and when all hands on deck are required. We will not allow our RMOs from the [REDACTED] Department to travel for a clearly non-essential purpose and I strongly urge you to reconsider. I consider continuing with the course irresponsible under current conditions.

I have included [REDACTED] in the e-mail for his reference.

Regards

[REDACTED]

Dr. [REDACTED]

C
N [REDACTED]



COVID response and ICU nursing education

- Over the six months from the start of the pandemic ,
 - 15 “BASIC for Nurses” face to face courses were run,
 - over 250 participants at three sites, Hawke’s Bay, Taranaki and Otago.
 - additional BASIC courses were also run in the same sites and the Wellington region for a mixture of medical staff and nursing.
 - Several Hospitals used the BASIC for Nurses material informally for COVID-19 response training, outside of the BASIC for Nurse's structure.
- Social distancing and maintenance of other isolation processes were challenging. Pre-recorded lectures, delivered through the BASIC for Nurses APP and to the website, reduced course duration and minimised contact time.



BASIC for Nurse COVID online version

- 103 Nurses completed modified Online BASIC for Nurses course. Participant held various clinical roles, including
 - The operating room,
 - PACU,
 - District nurses
 - Emergency care
 - Medical-surgical nursing.
 -
- The participant feedback was all positive.
- The participant nurses were in practice at four remote DHBs within NZ and the Tupua Tamasese Meaole (TTM) (National) Hospital, in Samoa.



Main menu

 [Site news](#)

Screenshot

Department of Anaesthesia & Intensive Care
The Chinese University of Hong Kong



Intensive Care E-learning

Courses



[▼ Collapse all](#)

▼ Acute care training

 [BASIC LR Severe Acute Respiratory Infection](#)  

 [Acute care for obstetricians](#)

 [Advanced cardiac life support for students](#)  


 [BASIC DHS](#)  

▼ Basic Intensive Care training




 [On-line BASIC for COVID](#)  

 [Intern training](#)

 [e-BASIC](#)  

 [BASIC for instructors](#)  

 [e-BASIC for Nurses](#) 


 [BASIC plus](#)  

 [Basic Sciences for Intensive Care](#)  







▼ Advanced Intensive Care training

 [Mechanical ventilation for Nurses](#) 











▼ Acute care training

-  BASIC LR Severe Acute Respiratory Infection ➔ **i**
-  Acute care for obstetricians
-  Advanced cardiac life support for students 🔍 **i**
-  BASIC DHS 🔍 **i**

▼ Basic Intensive Care training

-  On-line BASIC for COVID ➔ **i**
-  Intern training
-  e-BASIC 🔍 🔍 **i**
-  BASIC for instructors 🔍 🔍 **i**
-  e-BASIC for Nurses **i**
-  BASIC plus 🔍 🔍 **i**
-  Basic Sciences for Intensive Care ➔ **i**

▼ Advanced Intensive Care training

-  Mechanical ventilation for Nurses **i**
-  Airway management: beyond BASIC 🔍
-  Cardiovascular physiology in ICU 🔍 **i**
-  Intensive Care Nephrology: beyond BASIC 🔍 🔍 **i**
-  Intensive Care Nephrology Instructor course **i**
-  Mechanical ventilation - beyond BASIC (Select Blended Learning Course) 🔍 **i**
-  Mechanical ventilation - beyond BASIC (Instructor course) 🔍 **i**
-  Neurointensive care 🔍
-  Research 🔍 🔍 **i**
-  Advanced Intensive Care training - Summary 1 🔍 🔍 **i**

Mechanical ventilation 1

If you are applying a fixed pressure during each breath, and the respiratory system compliance goes down, will the tidal volume rise or fall?

Rise Fall

Submit

◀ Ventilator circuits (hidden)

Jump to... 

Mechanical ventilation 1

If you are applying a fixed pressure during each breath, and the respiratory system compliance goes down, will the tidal volume rise or fall?

Your answer :

Fall

Response:

Correct

Continue

[◀ Ventilator circuits \(hidden\)](#)

Jump to...



Mechanical ventilation 5

Desaturation and setting pressure control

Our patient's high airway pressure turned out to be due to sputum in the endotracheal tube and was corrected by suction.

However, a few hours later he desaturates.



- Check saturation tracing and probe positioning
- Check for chest expansion and symmetrical expansion
- Check ABG
- Check haemodynamics
- Increase FiO₂ to 1.0

Submit

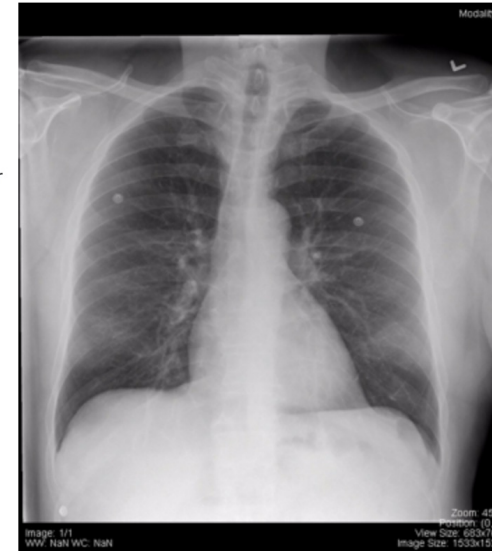


Interactive COVID lesson

1. Personal Protective Equipment and Infection Prevention and Control

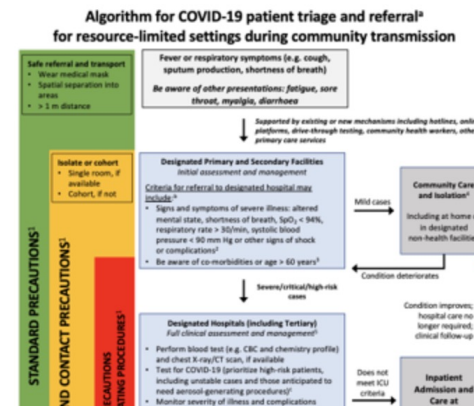
Case 1: Mrs. S

- **Patient:** 57 year old woman with suspected COVID-19 pneumonia presents to the hospital with shortness of breath and fever
- **Review of Systems:** + loss of smell/taste, headaches, decreased appetite for 1 week, previously healthy, no sick contacts
- **Exam:** SpO2 84% on RA, bilateral rhonchi, HR 100, RR 25, BP 133/90
- **Diagnostics:** CXR with mild infiltrates



Resource: Healthcare personnel should adhere to Standard and Transmission-based Precautions when caring for patients with SARS-CoV-2 infection. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/usin>

Does your facility have the appropriate PPE for healthcare workers to safely care for this patient?





Learnings

- Focus
 - Short lectures –pre prepared.
 - Focused skills stations
 - Allow time for handing over/ moving rooms etc.
 - Allow for breaks
 - Groups 4-6 ONLY – larger taints interaction.

Cost

- There are no license fees for *running* BASIC.
- Course material is supplied in an electronic format.
- Course manuals can be printed locally from the supplied pdf (colour printing is recommended) or supplied at cost (approximately US\$3 per book plus shipping).
- Registration fees for candidates vary from course to course depending on venue costs and degree of subsidy.
- Course set up will require instructors to be trained

A summary of individual courses is given in the table below.

Name	Target audience	Content
BASIC	Novice intensive care doctors	Introduction to intensive care with a focus on resuscitation and organ support, especially mechanical ventilation
BASIC for Nurses	Novice intensive care nurses	Introduction to intensive care with a focus on resuscitation and organ support, especially mechanical ventilation
Paediatric BASIC	Novices PICU doctors	Introduction to PICU with a focus on monitoring and organ support, especially mechanical ventilation
BASIC Patient Safety	Bedside clinicians ♦ (medical and nursing)	Patient Safety concepts with an emphasis on how clinicians can improve Patient Safety
Very BASIC	Medical students and junior doctors	Care of critically ill patients outside ICU
BASIC Low Resource (BASIC LR)	Doctors working in low resource settings	Care of critically ill patients in low resource settings. Developed at the request of and in collaboration with Medecins sans Frontieres, Paris.
BASIC LR for Nurses	Nurses working in low resource settings	Nursing care of critically ill patients in low resource settings. Developed at the request of and in collaboration with Medecins sans Frontieres, Paris.
BASIC Sciences	Intensive care trainees	Basic sciences underlying Intensive Care (course material in development)
Beyond BASIC Cardio-cerebral Resuscitation	Doctors involved in cardiac resuscitation	Advanced cardiac life support
Beyond BASIC Mechanical Ventilation	Intermediate-advanced Intensive Care trainees ♦♦ (or refresher for specialists)	Mechanical ventilation of critically ill patients
Beyond BASIC Intensive Care Nephrology	Intermediate-advanced Intensive Care trainees ♦ ♦(or refresher for specialists)	Nephrology relevant to Intensive Care, including renal replacement therapy
Beyond BASIC Airway Management	Intermediate-advanced Intensive Care trainees ♦♦ (or refresher for specialists)	Airway management in the critically ill including use of advanced airway techniques
Beyond BASIC Cardiothoracic Intensive Care	Intermediate-advanced Intensive Care trainees ♦♦ (or refresher for specialists)	Management of immediate post operative and critically ill cardiothoracic patients
BASIC Transthoracic Echocardiography	Doctors and healthcare workers interested in learning basic Focused Cardiac Ultrasound. No prior experience required.	