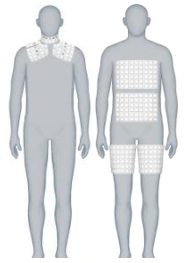


COOLING HAS A LONG TRADITION IN AUSTRIA



COOLING HAS A LONG TRADITION IN AUSTRIA

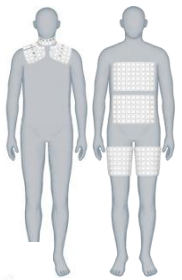


5000 Jahre „no flow“

...scherleiche, die das deutsche Ehepaar Simon vor 13 Jahren fand. Der „Eismann“, in England „Frozen Fritz“, sei uns bald „Ötzi“ genannt, erwies sich nach und nach als Sen-

26 Die Presse.com

Montag, 6. Dezember 2004



COOLING HAS A LONG TRADITION IN AUSTRIA

EMCOOLS
EASY EFFICIENT PATIENT COOLING

Historie 1962

Peter Safar (1924-2003); „Father of CPR“



ion). First composition in 1961, Pittsburgh, PA. J Iowa Medical Society 1964 (Nov): pp

HEART-LUNG RESUSCITATION

I FIRST AID: OXYGENATE THE BRAIN IMMEDIATELY

IF UNCONSCIOUS

Airway - TILT HEAD BACK

IF NOT BREATHING

Breathe - INFLATE LUNGS 2-5 TIMES, MAINTAIN HEAD TILT

mouth-to-mouth, mouth-to-nose, mouth-to-mouth, lung mask

SEEK PULSE

- IF PRESENT - CONTINUE LUNG INFLATIONS
- IF ABSENT -

Circulate - COMPRESS HEART ONCE A SECOND.

ALTERNATE 2-3 LUNG INFLATIONS WITH 15 STERNAL COMPRESSIONS UNTIL SPONTANEOUS PULSE RETURNS.

II START SPONTANEOUS CIRCULATION

Drugs - EPINEPHRINE: 10mg (10 CC OF 1:1000) I.V. OR 0.5mg INTRACARDIAC REPEAT LARGER DOSE IF NECESSARY.

SODIUM BICARBONATE: APPROXIMATELY 3.75 G/30 CC (1/2 DOSE IN CHILDREN) I.V. REPEAT EVERY 5 MINUTES IF NECESSARY.

E. K. G. - FIBRILLATION: EXTERNAL ELECTRIC DEFIBILLATION REPEAT SHOCK EVERY 1-3 MINUTES UNTIL FIBRILLATION REVERSED

- IF ASYSTOLE OR WEAK BEATS: EPINEPHRINE OR CALCIUM I.V.

Fluids - I.V. PLASMA, DEXTRAN, SALINE

Do not interrupt cardiac compressions and ventilation

Tracheal intubation early, when necessary

AFTER RETURN OF SPONTANEOUS CIRCULATION USE PNEUMOPRESSORS AS NEEDED.

x = NOREPINEPHRINE (Norepinephrine) I.V. DOP

III SUPPORT RECOVERY

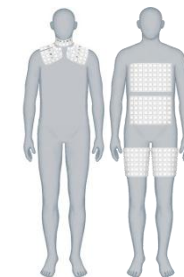
Gauge EVALUATE AND TREAT CAUSE OF ARREST

Hypothermia START WITHIN 30 MINUTES IF NO SIGN OF CNS RECOVERY

Intensive Care

- SUPPORT VENTILATION: TRACHEOTOMY PROLONGED CONTROLLED VENTILATION, GASTRIC TUBE AS NECESSARY
- SUPPORT CIRCULATION
- CONTROL CONVULSIONS
- MONITOR

Figure 1. Heart-lung resuscitation (cardiopulmonary-cerebral resuscitation). First composition in 1961, Pittsburgh, PA. Reproduced with permission from Safar P. Community-wide CPR. J Iowa Medical Society 1964 (Nov): pp 629-635.



COOLING HAS A LONG TRADITION IN AUSTRIA



Professor Fritz Sterz

Emergency Physician, Associate Professor of Internal Medicine in the Department of Emergency Medicine at the Vienna General Hospital

Dr Sterz has been involved in the field of emergency medicine since 1975. Research fellow at the Safar Center for Resuscitation Research under the tutelage of Dr Peter Safar at the University of Pittsburgh between 1987 and 1990.

He joined the faculty of the Department of Emergency Medicine at the AKH in 1992 and now serves as the Vice Director of Emergency Medicine. In 2002, he published the results of the landmark European Multi-center randomized controlled trial of therapeutic hypothermia for cardiac arrest in adults. He has played important roles on the development of resuscitation guidelines for the AHA.

He is on the **editorial board of the journal Resuscitation**, and received the Theodor Billroth Prize from Medical Association of Vienna.

HYPOTHERMIA GROUP OF VIENNA



Professor Wilhelm Behringer

Specialist for internal medicine and emergency medicine at the Department of Emergency Medicine, Medical University of Vienna

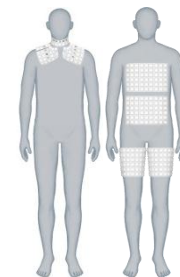
Professor Behringer is **Co-Founder of EMCOOLS-Emergency Medical Cooling Systems AG** and served as its **Medical Advisor** and Member of Supervisory Board. Prof. He is one of the world's most experienced scientists investigating the medical potential of hypothermia and has been conducting research in the field of therapeutic hypothermia at the University Clinic of Emergency Medicine at Vienna General Hospital (AKH) for a number of years. Previously, he carried out research at the University of Pittsburgh under Prof. Peter Safar, in the field of hypothermia, for several years.



Professor Michael Holzer

Associate Professor of Emergency Medicine, specialist in Intensive Care Medicine, Department of Emergency Medicine, Vienna University Hospital

His research focus is hypothermia after and during cardiac arrest, emergency Preservation and Resuscitation (EPR), Evidence based medicine, Efficient diagnosis and therapy in the Emergency Department. He has conducted clinical studies in the field of TTM and is collaborator of different international trials investigating temperature management.

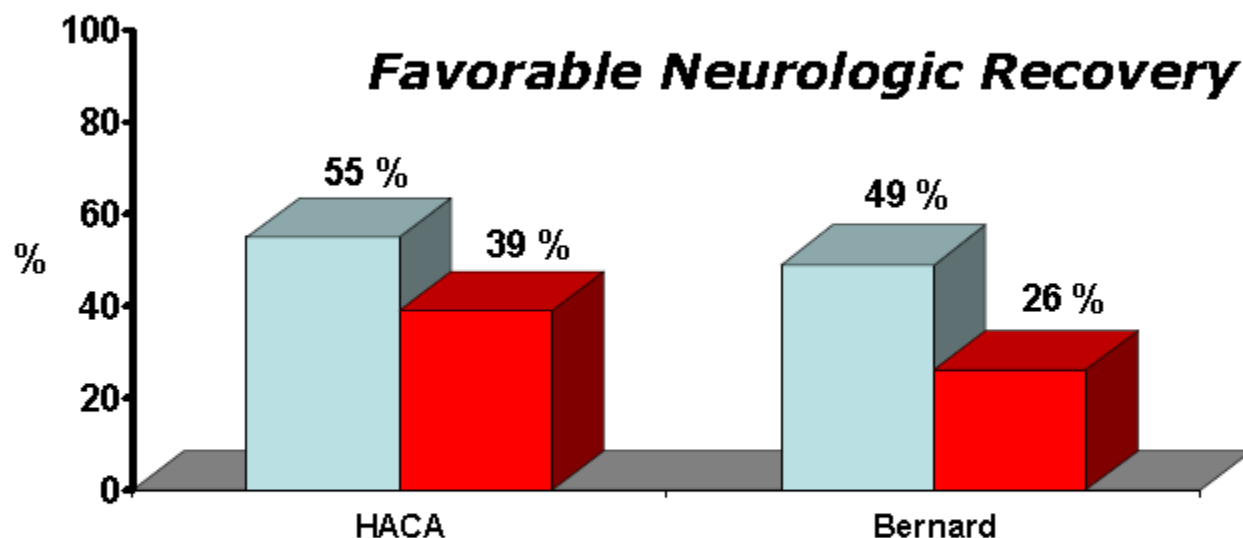


COOLING HAS A LONG TRADITION IN AUSTRIA

2012 HACA TRIAL VIENNA

HACA Trial, Bernard Studie

Randomized clinical trials of therapeutic hypothermia after cardiac arrest



n = 273

p = 0.009

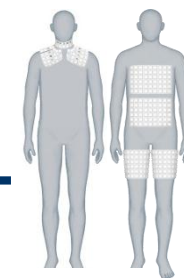
Favorable neurologic
outcome after 6 months

■ Hypothermia ■ Normothermia

n = 77

p = 0.046

Survival to hospital
discharge



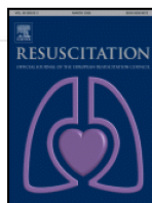
GUIDELINES BASED ON HACA & BERNARD TRIAL

EMCOOLS
EASY EFFICIENT PATIENT COOLING

Historie ERC Guidelines 2005



European
Resuscitation
Council



Unconscious adult patients with spontaneous circulation after **out-of-hospital VF** cardiac arrest should be cooled to **32–34°C**. Cooling should be started **as soon as possible** and continued for at least 12–24h.^{368–374} Induced hypothermia might also benefit unconscious adult patients with spontaneous circulation after out-of-hospital cardiac arrest from a non-shockable rhythm, or cardiac arrest in hospital. Treat shivering by ensuring ade-



The NEW ENGLAND
JOURNAL of MEDICINE

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ORIGINAL ARTICLE

Targeted Temperature Management at 33°C versus 36°C after Cardiac Arrest

Niklas Nielsen, M.D., Ph.D., Jørn Wetterslev, M.D., Ph.D., Tobias Cronberg, M.D., Ph.D., David Erlinge, M.D., Ph.D., Yvan Gasche, M.D., Christian Hassager, M.D., D.M.Sc., Janneke Horn, M.D., Ph.D., Jan Hovdenes, M.D., Ph.D., Jesper Kjaergaard, M.D., D.M.Sc., Michael Kuiper, M.D., Ph.D., Tommaso Pellis, M.D., Pascal Stammet, M.D., Michael Wanscher, M.D., Ph.D., Matt P. Wise, M.D., D.Phil., Anders Åneman, M.D., Ph.D., Nawaf Al-Subaie, M.D., Søren Boesgaard, M.D., D.M.Sc., John Bro-Jeppesen, M.D., Iole Brunetti, M.D., Jan Frederik Bugge, M.D., Ph.D., Christopher D. Hingston, M.D., Nicole P. Juffermans, M.D., Ph.D., Matty Koopmans, R.N., M.Sc., Lars Køber, M.D., D.M.Sc., Jørund Langengen, M.D., Gisela Lija, O.T., Jacob Eifer Møller, M.D., D.M.Sc., Malin Rundgren, M.D., Ph.D., Christian Rylander, M.D., Ph.D., Ondrej Smid, M.D., Christophe Werer, M.D., Per Winkel, M.D., D.M.Sc., and Hans Friberg, M.D., Ph.D. for the TTM Trial Investigators

N Engl J Med 2013; 369:2197-2206 | December 5, 2013 | DOI: 10.1056/NEJMoa1310519

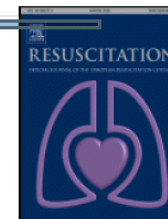
Share:

EMCOOLS
EASY EFFICIENT PATIENT COOLING

Historie ERC Guidelines 2010



European
Resuscitation
Council



„Use of therapeutic hypothermia to include comatose survivors of cardiac arrest associated **initially with nonshockable rhythms as well shockable rhythms**. The lower level of evidence for use after cardiac arrest from nonshockable rhythms is acknowledged.“

Therapeutic Hypothermia in Newly Born Infants

„Newly born infants born at term or near-term with evolving moderate to severe hypoxic – ischaemic encephalopathy should, where possible, be treated with therapeutic hypothermia.

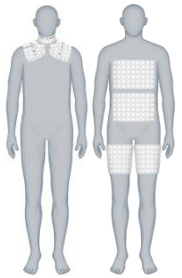
This does not affect immediate resuscitation but is important for postresuscitation care.“

The ILCOR Consensus February 2015 STILL COOLING AND TTM IN

- :OHCA with an initial shockable rhythm
- * OHCA with an initial non-shockable rhythm
- * IHCA with any initial rhythm
- * Duration of induced hypothermia 24h
- * stop for Pre-hospital cooling with cold intravenous fluid

COOLING HAS A LONG TRADITION IN AUSTRIA EMERGENCY MEDICAL SERVICES OF VIENNA



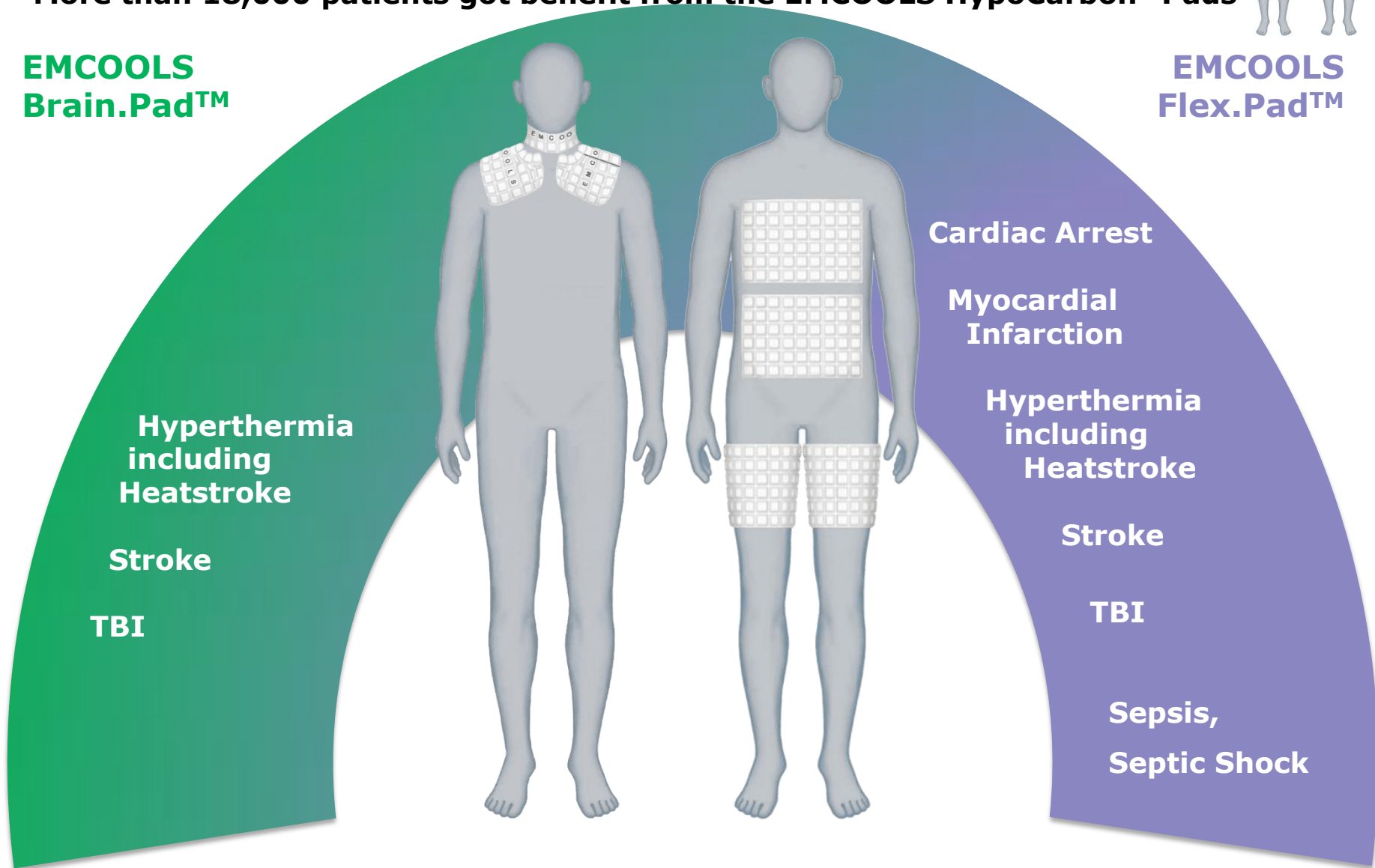


COOLING HAS A LONG TRADITION IN AUSTRIA

More than 18,000 patients got benefit from the EMCOOLS HypoCarbon® Pads

EMCOOLS
Brain.Pad™

EMCOOLS
Flex.Pad™



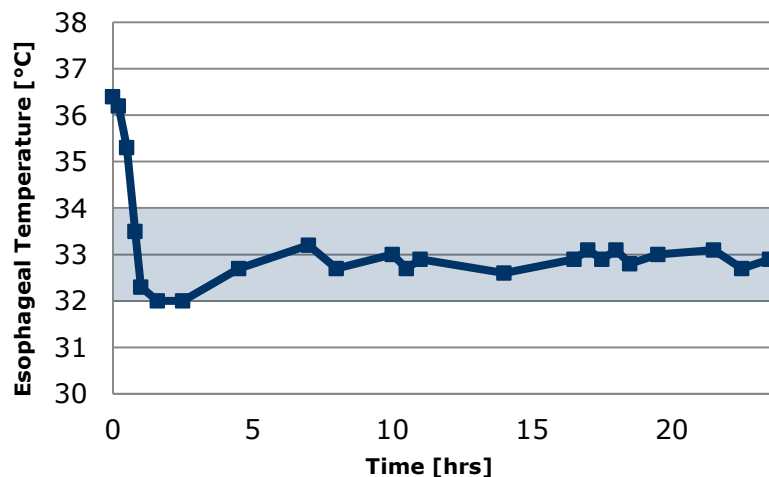


COOLING HAS A LONG TRADITION IN AUSTRIA

CARDIAC ARREST

THERAPEUTIC HYPOTHERMIA – URAY ET AL. STUDY

For initial cooling 1 Flex.Pad™ is applied per 10kg body weight. This reflects an average cooling rate of 3.3°C/hour. **Note:** at 34°C all Pads are removed from the patient.



The Uray-Study (2008) shows, that an esophageal temperature of 34°C has been reached within 54 min (Ø- value) .¹



ILCOR suggests that clinicians provide postresuscitation care based on the current treatment recommendations (32-34°C).

The **ERC** and **AHA Guidelines** recommend cooling to 32-34°C.

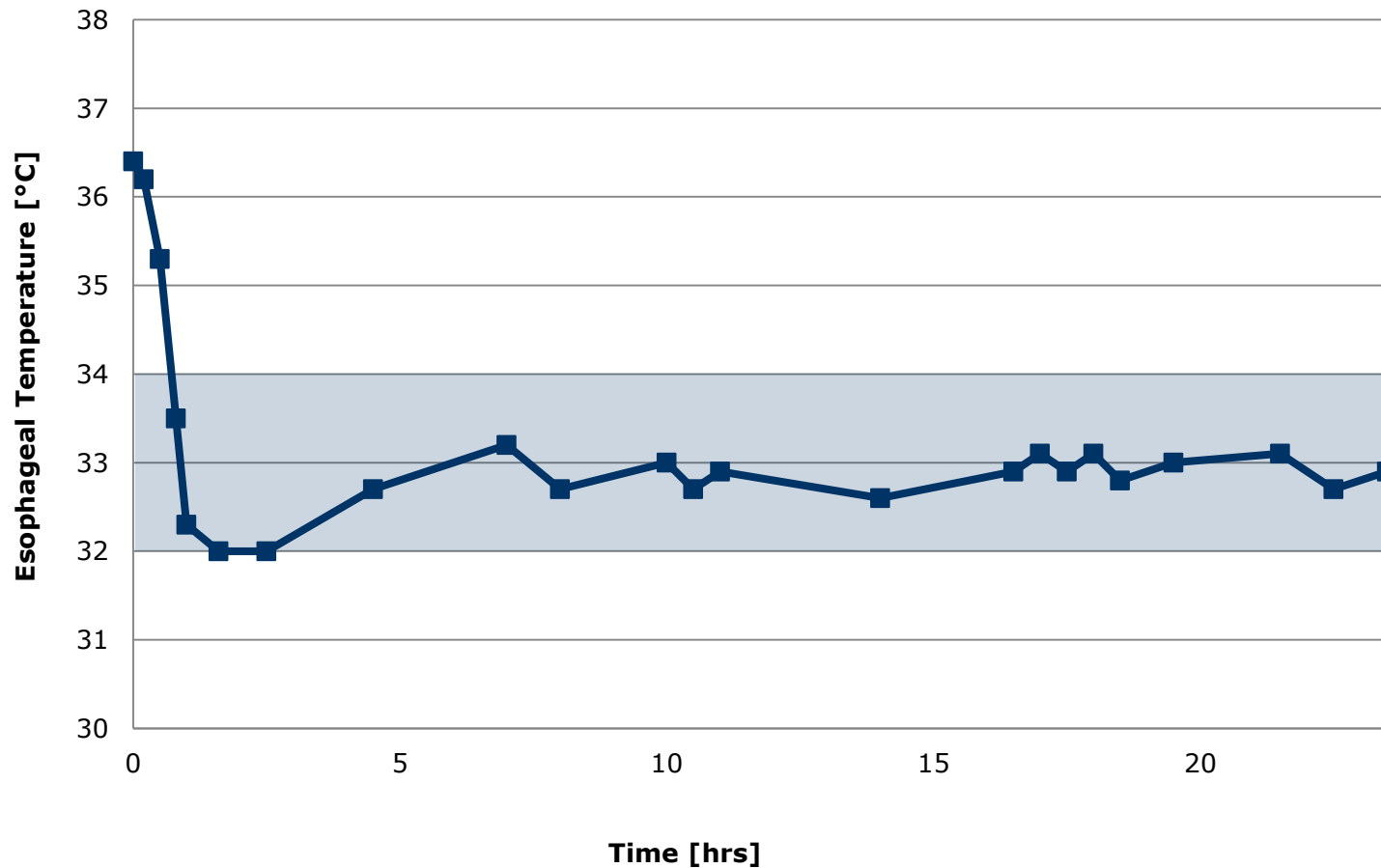


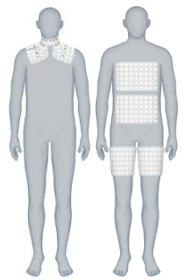


COOLING HAS A LONG TRADITION IN AUSTRIA

CARDIAC ARREST

THERAPEUTIC HYPOTHERMIA – URAY ET AL. STUDY

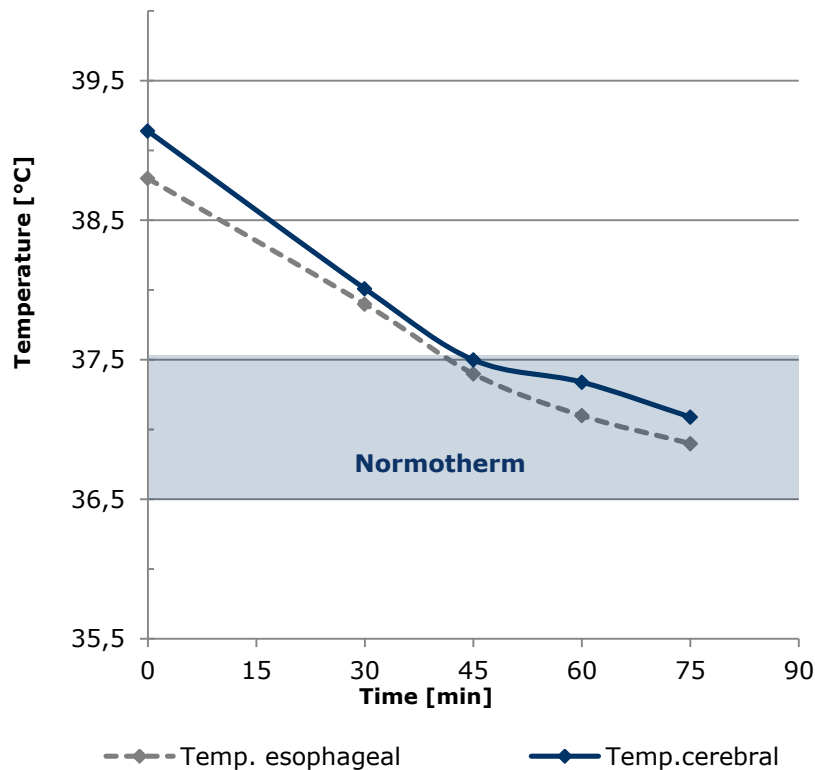




COOLING HAS A LONG TRADITION IN AUSTRIA SEVERE TRAUMATIC-BRAIN-INJURY

FEVER TREATMENT WITH BRAIN.PAD™ – CASE REPORT

Reduction of elevated temperatures to normothermia in a patient with severe TBI with 1 Brain.Pad™

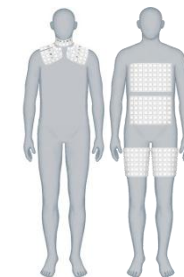


Temperature reduction

Δ Temp. / hour	1.7°C
Temperature reduction to normothermia	1 Brain.Pad™



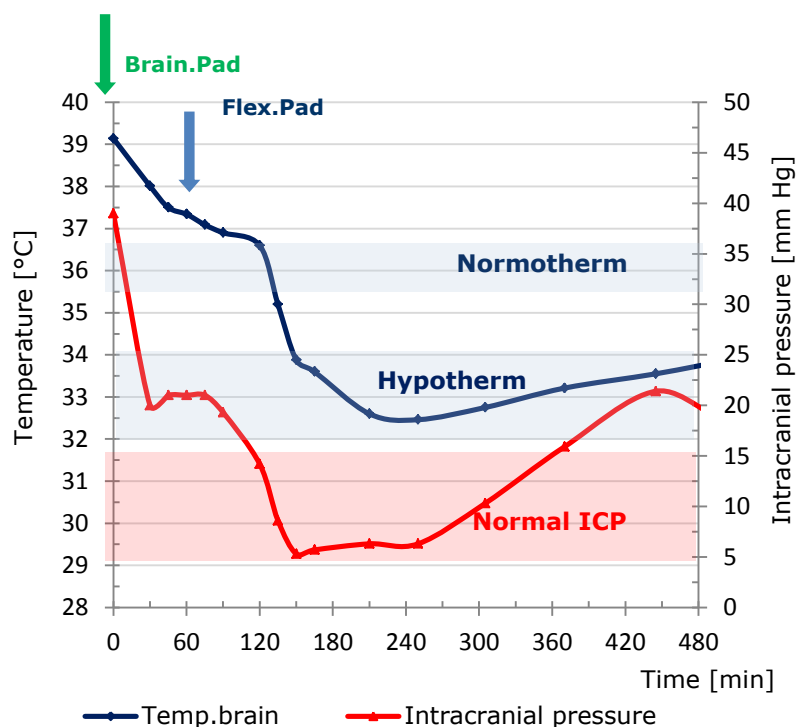
The **current guidelines** for adult and pediatric TBI patients recommend: maintenance of normothermic body temperatures should be standard of care in TBI



COOLING HAS A LONG TRADITION IN AUSTRIA SEVERE TRAUMATIC-BRAIN-INJURY

HYPOTHERMIA FOR TREATMENT OF ELEVATED ICP WITH FLEX.PAD – CASE REPORT

Patient with severe traumatic-brain-injury: Fever treatment with 1 Brain.Pad™, followed by therapeutic hypothermia (32-34°C) for treatment of severe increase in ICP with 1 Flex.Pad™ per 10 kg body weight.

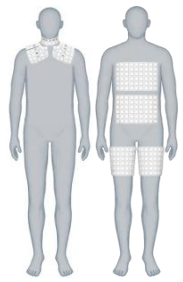


Therapeutic hypothermia for ICP reduction

Δ Temp. brain / hour	2.4 °C
Therap. hypothermia (32-34°C)	4 Flex.Pad™
ICP reduction > 40mm Hg to	6-21 mm Hg



The **Brain Trauma Foundation** recommends therapeutic hypothermia for the treatment of elevated ICP (= Class III evidence)

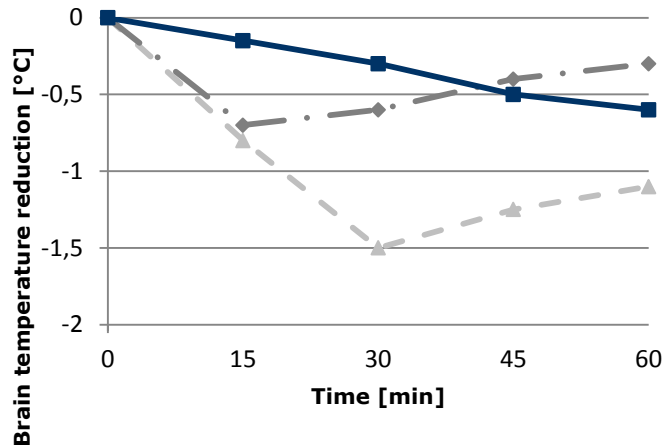


COOLING HAS A LONG TRADITION IN AUSTRIA

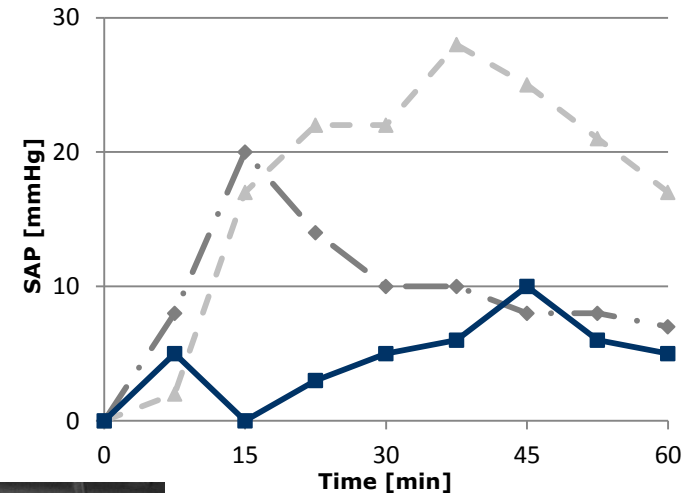
ACUTE STROKE

TEMPERATURE REDUCTION WITH BRAIN.PAD – iCOOL 2 & iCOOL 3 STUDIES

Treatment of acute, un- and conscious stroke patients with one Brain.Pad™ (temperature reduction of 0.5°C/h). Cold IV is characterized by immediate rebound after the therapy is stopped.



- ▲— Cold Infusion 2L / 30min
- ◆— Cold Infusion 1L / 15min
- EMCOOLS Brain.Pad



- ▲— Cold Infusion 2L / 30min
- ◆— Cold Infusion 1L / 15min
- EMCOOLS Brain.Pad

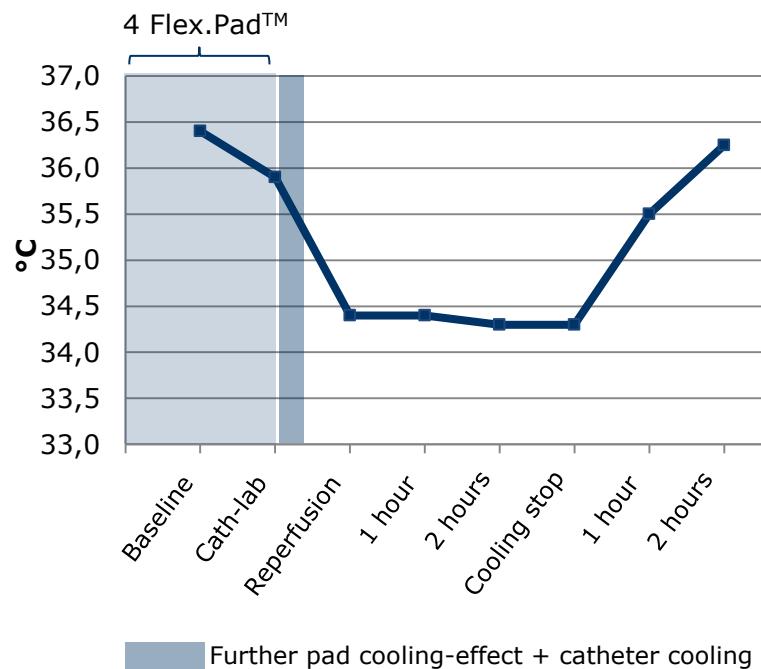




ACUTE MYOCARDIAL INFARCTION

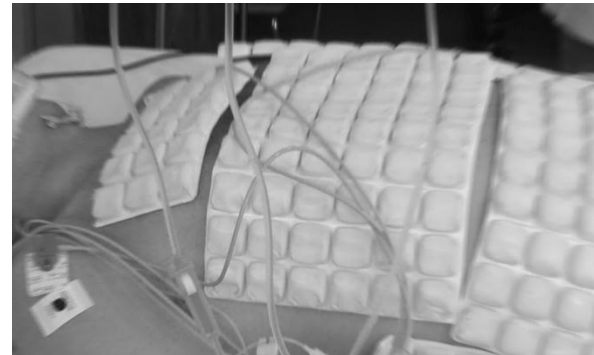
TEMPERATURE REDUCTION WITH FLEX.PAD – TESTORI ET AL. STUDY

Temperature reduction in patients with acute myocardial infarction (awake patients) with Ø 4 Flex.Pads
0,6°C temperature reduction in awake, sedated AMI patients is a unique drop.



Temperature reduction

Δ Temp. / hour	0.6°C
Flex.Pads removed after	48min



Note: Initial temperature reduction was performed with EMCOOLS Flex.Pad, partly in combination with Cold IV. In-hospital cooling was performed invasively.



THANK YOU!

TEŞEKKÜRLER!