

# The importance of accurate resting energy expenditure (REE) measurement in patients with overweight and obesity

Rapid systematic review

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- The authors declare they have no conflict of interest



# Resting Energy Expenditure (REE) measurement

## BMR FORMULAS



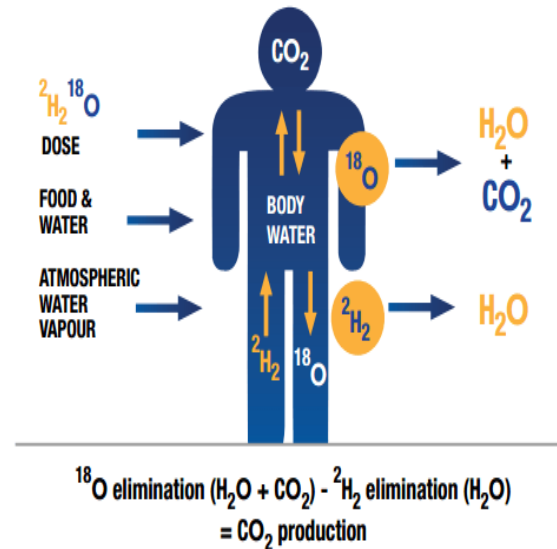
MEN

$$\text{BMR} = (10 \times \text{weight [kg]}) + (6.25 \times \text{height [cm]}) - (5 \times \text{age [yrs]}) + 5$$



WOMEN

$$\text{BMR} = (10 \times \text{weight [kg]}) + (6.25 \times \text{height [cm]}) - (5 \times \text{age [yrs]}) - 161$$



Predictive equations

Doubly labelled water

Indirect calorimetry



# Psychometric evaluation

## Concurrent Validity

Did the device accurately measure REE as compared to “gold standard” or “benchmark”

## Predictive Validity

Was REE as measured by the device able predict health outcomes such as weight change

## Reliability

Do repeated measures of REE by the device give the same result

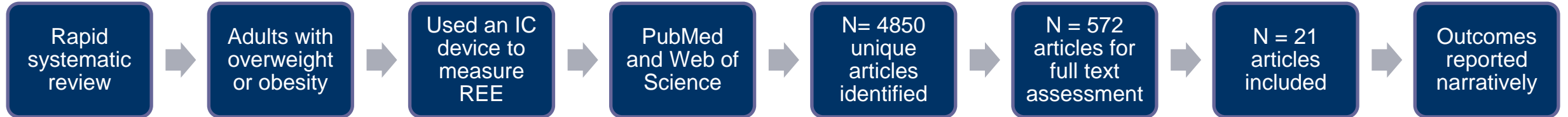
Does REE as measured by Indirect Calorimetry have value in the clinical setting?



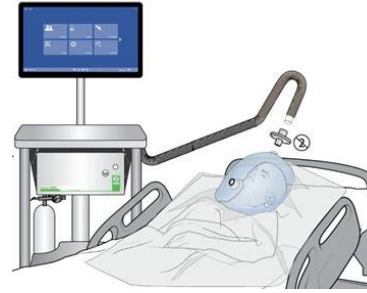
# Study methodology

## Study aim

To examine the validity, predictive ability and reliability of indirect calorimetry (IC) compared to all other forms of REE measurement in adults with overweight and obesity



# Included indirect calorimetry devices



Standard desktop  
(metabolic cart) (n=8)



Hand-held IC  
devices (n=1)



BIA devices  
(n=1)



Whole-room  
IC (n=1)



Accelerometer  
(n=1)



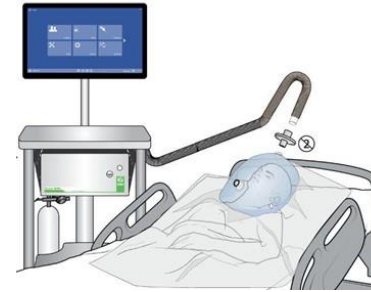
# Concurrent validity findings



Hand-held IC devices  
(n=6 studies)



BIA device  
(n=1 study)



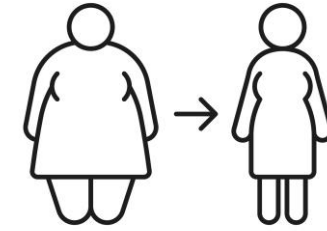
Standard desktop IC devices  
(n=4 studies)



Accelerometer device  
(n=1 study)



# Predictive ability for weight change



Predictive  
ability

n=4 standard desktop devices evaluated (n= 7 studies)

No  
significance

n=5 studies found no effect



Predict  
weight loss

n=1 study found REE measured pre-MBS predicted 1yr postop weight loss



Clinical utility

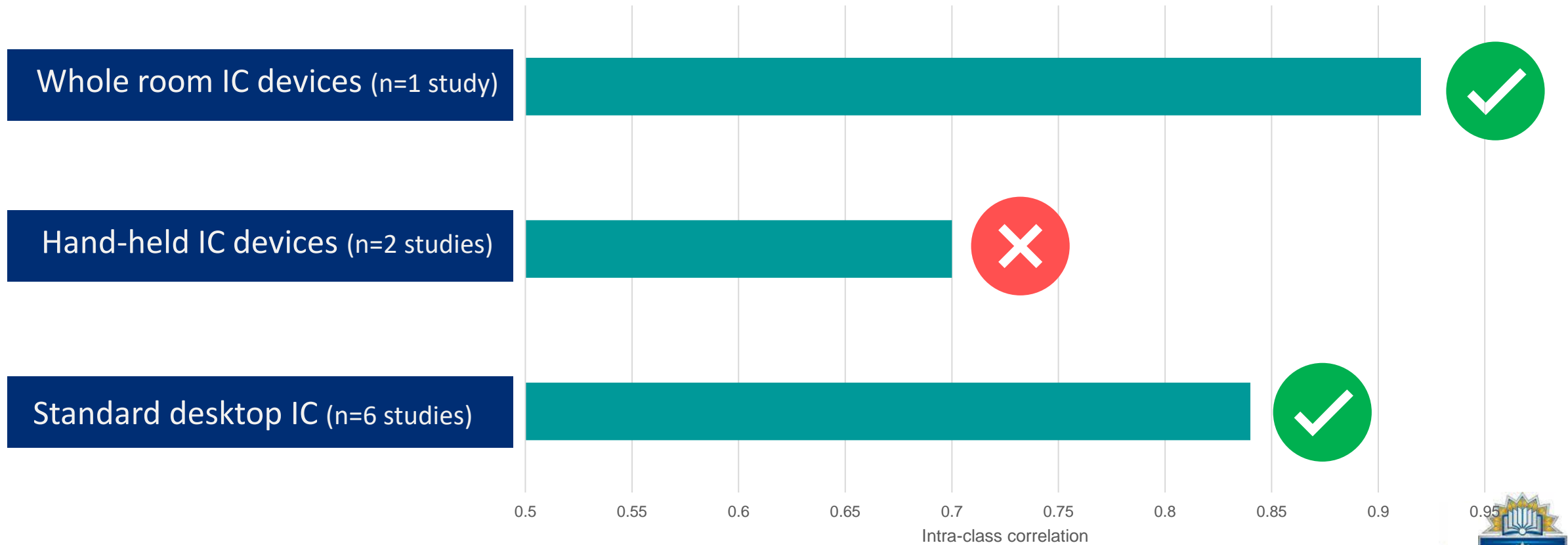
n=1 study found REE diet prescription = greater weight loss






















# Reliability findings

Reliability (ICC) of different REE measurement devices



# Summary of results for indirect calorimetry (IC)

	Standard desktop cart (metabolic cart) IC	Hand-held IC	Whole room IC	Accelerometry	Bioelectrical impedance
Validity					
Predictive ability					
Reliability					

 = Conflicting results     = Not assessed

More research required!



# Thank-you



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