

Port Lincoln Lung Function Study

**Wendy Newbury^{1,3},
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Establishing Australian normative data for the impulse oscillometry instrument

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Background

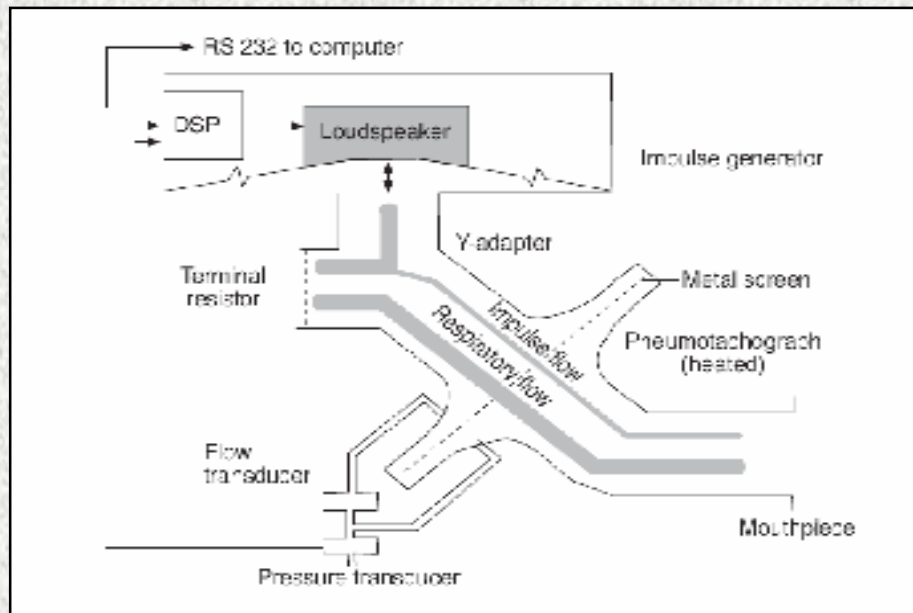
The Impulse Oscillometry (IOS) instrument

- measures respiratory function by transmitting audible sound waves down the airway and measuring reflected sound.
- Computer analysis of the reflected sound describes the flow of air through the participant's lungs, and calculates respiratory impedance and its components, resistance and reactance, at a range of frequencies from 0.1Hz to 150Hz.

Background

- The IOS software generates predicted normal values (based on German data) for each of the parameters measured including total airway resistance (R5), the proximal airway resistance (R20) and peripheral capacitive reactance (X5).

The IOS



Reference:

1. Smith H, Reinhold P, Goldman M. Forced oscillation technique and impulse oscillometry. Eur Respir Mon 2005(31):72-105.
www.viasyshealthcare.com/prod_serv/downloads/ra_ch5.pdf

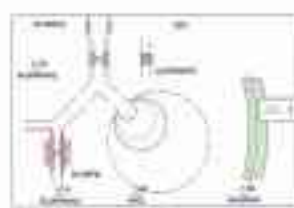
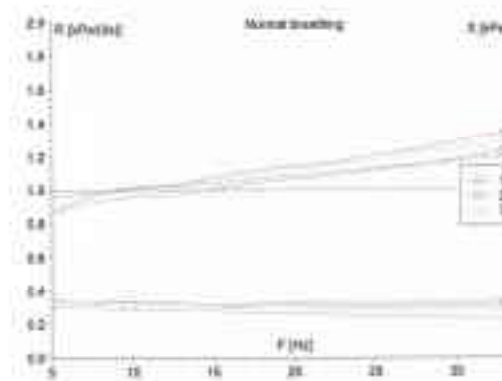
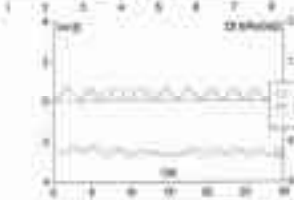
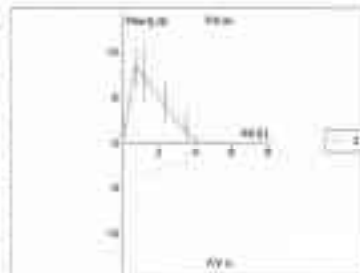
*Primary Care Respiratory Unit
Discipline of General Practice
School of Population Health & Clinical Medicine
The University of Adelaide
ADELAIDE SA 5005*

Last Name: xxx Identification: 00
 First Name: nxxx
 Date of Birth: 17/08/1942 Age: 64 Years
 Sex: male Weight: 80.4 kg
 Profession: Height: 178 cm

Date: 02/04/2011
 Time: 02:33

	Unit	Pre	Post	SAVES
FVC	[L]	4.31	4.73	109.9
FEV1	[L]	3.28	3.75	114.9
FEV1 % VC	[%]	76.09	79.21	104.7
PEF	[L/s]	8.38	9.12	98.0
PEF 75	[L/s]	1.87	1.27	68.4
PEF 50	[L/s]	8.83	4.80	107.9
PEF 25	[L/s]	7.40	7.13	95.9

VT		1.68	2.28	82.3
Z Del 0 Hz	[kPa/L/s]	0.30	0.34	112.1
R at 5 Hz	[kPa/L/s]	0.30	0.34	112.5
R at 10 Hz	[kPa/L/s]	0.29	0.32	111.9
R at 15 Hz	[kPa/L/s]	0.28	0.31	110.3
R at 20 Hz	[kPa/L/s]	0.28	0.31	117.0
R at 25 Hz	[kPa/L/s]	0.23	0.30	146.2
X at 5 Hz	[kPa/L/s]	-0.02	-0.04	207.2
X at 10 Hz	[kPa/L/s]	0.00	0.02	206.0
X at 15 Hz	[kPa/L/s]	0.02	0.00	135.7
X at 20 Hz	[kPa/L/s]	0.04	0.08	129.7
X at 25 Hz	[kPa/L/s]	0.11	0.16	187.2
Resonant frequency	[1/s]			6.92
Central	[kPa/L/s]			0.13
Peripheral	[kPa/L/s]			0.19
Distal	[1/kPa]			2.00



Aims

- This project has set about establishing Australian normative data which can then be used as a baseline for further research projects.

Hypotheses

- Data won't be significantly different to German data
- We will be able to produce Australian predictive equations for IOS
- Spirometry results for our sample will not be different to previously published Australian population sample.

Methodology

- Cross-sectional study of 100 community dwelling adults, in Port Lincoln - a town 700 km from Adelaide, with no known occupational dust exposure.
- 10 males and 10 females per 10-year cohort.
- **Inclusion criteria:** age range 25-74 years, non-smokers, in apparently good respiratory health.
- **Exclusion criteria:** smokers, asthmatics and others with acute or chronic respiratory disease.

Results

	Male	Female
25-34	12	12
35-44	10	12
45-54	10	14
55-64	16	16
65-74	10	8

Results

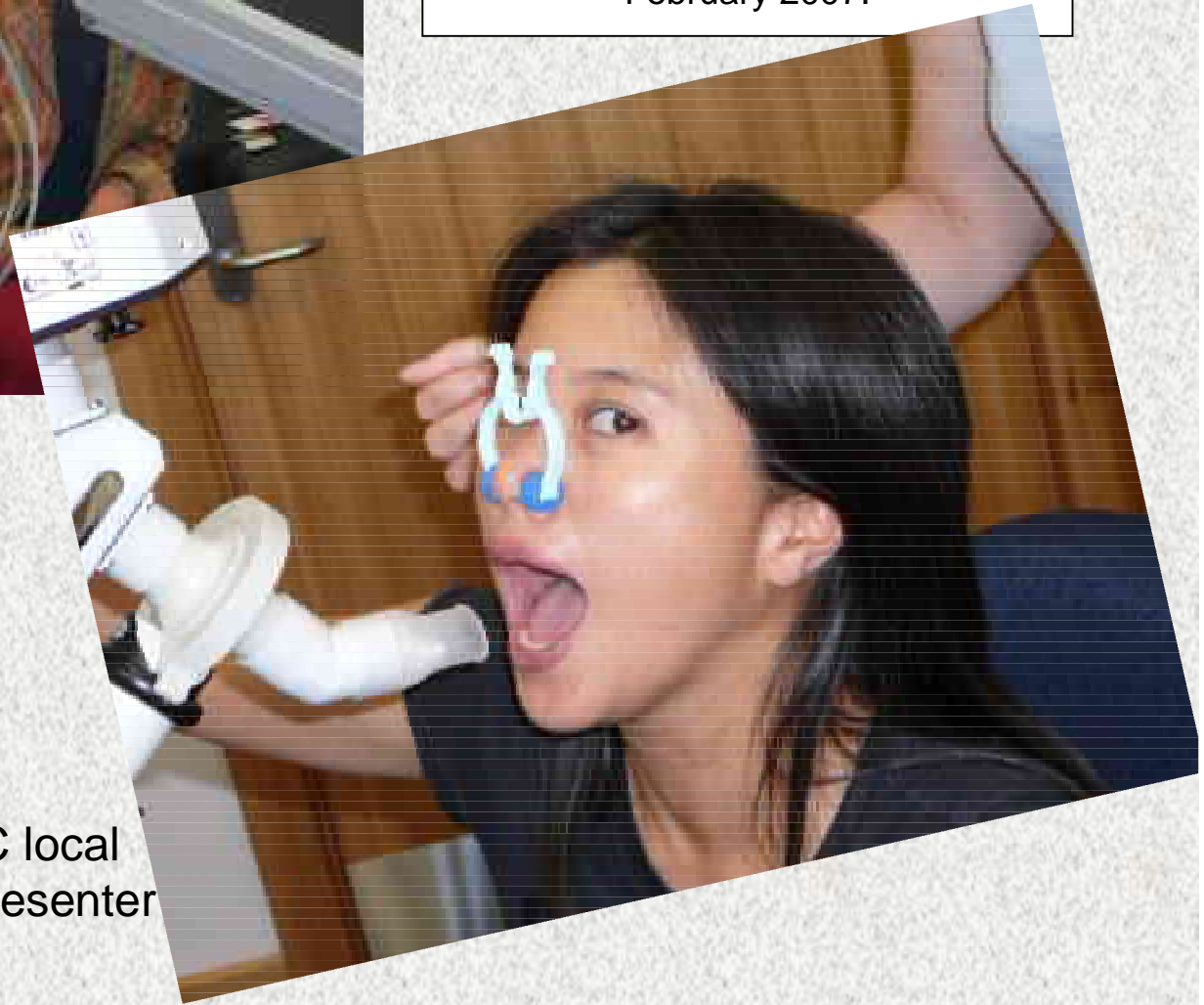
	Males	Females	Both
Age – mean	49.11	49.07	49.09
Range	25-74	25-72	25-74
R5 – mean	0.28255	0.32172	0.30232
Standard Deviation	0.080613	0.077310	0.081016
X5 – mean	-0.07732	-0.10398	-0.09078
Standard Deviation	0.028508	0.037468	0.035777
R20 – mean	0.23530	0.28269	0.25921
Standard Deviation	0.062379	0.065262	0.067860

Results

- Predictive normal equations use height, weight, gender, & age. The data from this study has generated Australian predictive equations which are being compared to the current published equations and correlated with Australian spirometric data.



The Hon. John Hill MP (SA Minister for Health), and The Hon Gail Gago MLC (SA Minister for Mental Health and Substance Abuse) experiencing first hand the IOS instrument at the SGRHS Port Lincoln Campus, February 2007.



Lisa Leong, ABC local radio morning presenter

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