HEART RX CAIRNS

The Murmur

Whats new in Cardiology

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PRACTISING

Clinical Cardiology

Transoesophageal Echocardiography

Echocardiography

Stress Echocardiography

Contrast Echocardiography

Dobutamine Stress Echocardiography

Stress Testing

Holter Monitoring

Event Monitoring

Ambulatory BP Monitoring

Pacemaker and Defibrillator

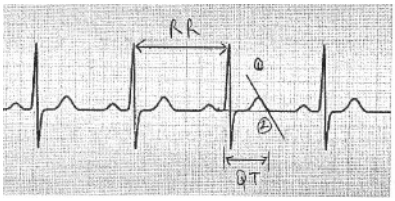
We all enjoyed catching up with a lot of GP's at the recent Palm Cove Cardiology Conference. It was great to get such positive feedback about our direct access services in echocardiography, stress echo and stress testing. In this edition of "*The Murmur*" we have outlined how to get the most out of our echocardiography reports. From the feedback we received, we identified this as something that a lot of GPs would find useful. Our bulk bill echocardiography service continues to grow with outreach services now in these centres Edmonton, Smithfield, Gordonvale, Kuranda, Mareeba, Atherton , Mossman and Yungaburra, as well as in-house at our office at 12 Grove St in North Cairns. Our echocardiography services in Cairns now have expanded to include Contrast Echocardiography and Contrast Stress Echocardiography. The contrast agent improves image quality in suboptimal imaging subjects. Also, Dr Sam Hillier has commenced a Dobutamine Stress Echo service to assess patients who cannot manage to exercise adequately on a treadmill. We also ascertained at the Palm Cove Conference that GPs were very interested in Dr Ben Reeves' description of how to measure the QT interval, so we have published his QT measurement tips here as well. We hope you find this edition of "*The Murmur*" helpful.

How to calculate a corrected QT interval?

Traditionally we would use lead II, or if the T-wave is difficult to see, occasionally lead V5. The QT interval is "correct" for the heart rate, which is important as it varies considerable at different heart rates, which is problematic especially in the presence of sinus arrhythmia. Always try to measure the QTc at the point on the ECG which shows the shortest RR interval (this will be the patient's longest QTc).

The formula to use is Bazetts formula: QTc=QT/square root of preceding RR interval. This is made difficult in cases where the baseline "wanders". To solve this we use a few tricks:

1. Draw a line along the maximal slope of the T-wave
2. The P-Q segment is regarded as baseline so draw a line to intersect this with the T-wave line
3. That point is regarded as the end of the T-wave
4. Each small square is 0.04 ms, each large square is 0.2ms so count along from the start of Q-wave (or R wave if there is no Q-wave) to the end of the T-wave as found above
5. The R-R interval of the preceding beat is then calculated and then it is time for the calculator



$$QT_c = \frac{QT}{\sqrt{RR}}$$

Interpreting just how long is too long is another art we have not yet mastered, since a certain proportion of people with "long QT syndrome" will actually be in the normal range for QTc durations. The higher the QT interval the more likely someone is to have a long QT syndrome. Briefly though, QTc<440ms is very likely to be normal, QTc>480ms is likely to be abnormal and between 440-480 is an intermediate risk group.

If there is concern about a long QT syndrome, the first step whilst awaiting specialist assessment is to avoid drugs known to prolong the QT interval. A full list updated regularly can be found here: www.qtdrugs.org.

An excellent summary of Australia and New Zealand recommendations is found here: www.csanz.edu.au/documents/guidelines/clinical_practice/Familial_Long_QT_Syndrome.pdf

By Ben Reeves

Patient Out of Pocket Costs

Initial Consult	$66.00
Review	$66.00
Holter Monitor	$66.00
Event Recorder	$66.00
ABP Monitor	$83.00
Stress Echo	$165.00
Direct Access Stress Test	$ 99.00

Echocardiograms bulk billed (when performed by sonographer)

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Reading an Echo Report—A Guide to getting the most out of the Report!

We endeavour to provide accurate and useful reports to our referrers with sufficient detail, but not a report overloaded with irrelevant information, so that the important features are easily appreciated.

The content of our report includes obvious things like date, indication, image quality.

Indication : the more information given the better, for example if the patient has an AVR – type and size is a prerequisite to quantifying it's function

We also state the patient's BSA and where relevant, index data for example LV and LA volumes, as well as aortic root diameters.

The patient's rate and rhythm are also stated.

Chamber sizes / volume calculations – diameters and comparison with normal ranges.

Wall thickness – whether concentric, asymmetric, or sigmoid shaped (in elderly patients).

Left Ventricular Systolic function

What's the EF? And by which method – M-mode, 2D, Visual estimate, Bi-Plane Simpson's (volume / method of discs).

If impaired is it global (Cardiomyopathy) or Regional (Ischaemic / Sarcoid?)

LV diastolic dysfunction – In clinical heart failure, diastolic dysfunction can precede systolic dysfunction. In systolic dysfunction, diastolic dysfunction is inevitable. Modern reporting uses normal or grades 1-4 rather than mild, moderate or severe.

Increase in left atrial volume is a morphologic expression of diastolic dysfunction reflecting increase in LV end-diastolic pressure. Transverse diameters often underestimate the volume of the enlarging left atrium.

Grade 1 – mildest form, "abnormal relaxation pattern", can be normal for age

Grade 1a - abnormal relaxation, normal filling pressure (e:e' <8)

Grade 1b – Abnormal relaxation, indeterminate filling pressure (e:e' 8-12)

Grade 1c – Abnormal relaxation, elevated filling pressure (e:e' >12)

Grade 2 – Moderate dysfunction "Pseudonormal filling" (when left atrial pressure has risen to 'normalise' the mitral inflow pattern), is associated with increased left atrial pressure and left atrial enlargement.

Grades 3 & 4 – severe forms, poorer prognosis:

Grade 3 demonstrates reversibility with Valsalva "reversible restrictive diastolic dysfunction".

Grade 4 no reversibility "fixed restrictive diastolic dysfunction".

Grades 3 & 4 will have elevated left atrial pressure and may have reduced EF.

RV systolic function : size, diameter, site

Is usually based on a visual assessment of the radial systolic function.

TAPSE – Tricuspid Annular Plane of Systolic Excursion is good at determining the RV longitudinal function, which often is depressed earlier than the radial systolic function. The RV S' velocity is the velocity of the tricuspid annular systolic motion – normal range >10cm/sec.

RV Systolic Pressure (RVSP) – based on the Tricuspid Regurgitation peak velocity

Right Atrial Pressure (RAP) – estimate made by assessment of the IVC appearance.

Valves

Morphology, mobility, thickness -

*With a bicuspid aortic valve is there associated aortopathy or coarctation?

Regurgitation – Grades 1,2,3,&4 replacing trivial, mild, moderate and severe – assessed with careful Doppler mapping, but where relevant we also use other methods : - PISA where estimation of effective regurgitant orifice area and regurgitant volumes can be calculated, pressure half time for aortic regurgitation, CW Doppler, flow reversal in pulmonary veins (MR), flow reversal in the desc thoracic aorta (AR) and flow reversal in the hepatic veins (TR).

Stenosis ; Peak and Mean Pressure Gradients are the stalwarts, the purest methods, but we also estimate the effective orifice area (EOA) via continuity method. For mitral stenosis, the pressure half –time method (PHT) is a standard method of estimating mitral valve area, but we sometimes utilise other methods as well.

Pericardium

Small effusions are often physiologic, not important.

Size (trace, small, moderate or large collection), global or loculated, echo free or echo dense (fibrinous strands / clot).

Tamponade is a clinical diagnosis, but echo Doppler features can alert to haemodynamic problems.

Incidental Findings might include…

Congenital findings

Dilated aorta / aneurysm

Pleural effusion

Hepatic masses (sub-costal window)

By Alana Evans Sonographer