

# **French-Canadian modified Delphi to facilitate the Echocardiographic Screening of Cardiac Amyloidosis in Patients with Aortic Stenosis.**

## **First round results.**

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## **BACKGROUND:**

Cardiac amyloidosis (CA) can be found in up to 10-15% of patients with aortic stenosis (AS). Identifying echocardiograms suggestive of CA is challenging and becomes even more complex in patients with AS since the diseases share similar features. There is currently no defined strategy to help echocardiographers raise the potential diagnosis of CA in AS patients. Our goal is to provide an expert-based “consensus” document with recommended echocardiographic criteria to raise the possibility of CA in patients with AS.

## **METHODS:**

A modified Delphi process was implemented, consisting of several rounds of anonymous surveys to gather experts’ opinions. The first survey was based on literature review to identify all echocardiographic parameters indicating possible CA. Twenty experts in echocardiography and either amyloidosis, AS, or both, were recruited to answer the surveys. A core team of 6 moderators/reviewers validated each step of the process. For the first survey, each expert rated each parameter on a 7-point Likert scale, according to the perceived performance of that parameter to rule in or rule out the diagnosis of CA. A parameter was then classified to be retained, discarded or discussed by the moderators. We present the results of this 1<sup>st</sup> survey.

## **RESULTS:**

Thirty-four echocardiographic parameters and 3 clinical characteristics, classified into 6 domains (**Table**), were submitted for the 1<sup>st</sup> survey. Fourteen experts completed the survey, 9 (64%) from Canada and 5 (36%) from France. Among the 37 parameters, 15 (41%) were retained (e.g. parameters related to left and right ventricle wall thicknesses, strain, left atrium), 11 (30%) were discarded (e.g. granular sparkling), and 11 (30%) will be discussed further. Interestingly, at least one parameter of each domain reached the “keep” criterion. Canadian and French experts were concordant in their choice for 21 (57%) parameters (16 “keep”, 4 “discard”) but conflicting for the other 16 (43%).

## **CONCLUSION:**

Up to 41% of parameters, covering all the predefined domains, were retained for the next survey, while only one third were discarded, and one third remain to be discussed by the moderators. Future rounds will classify these parameters according to their perceived sensitivity and specificity and determine optimal cutoffs.

**Table. Summarized answers by the experts for each parameters included in the first Delphi survey**

Domain	Parameter	Decision about the parameter*	Grade		"No opinion" n (%)
			Median	IQR	
Demographics	Age	keep	6	1	0 (0%)
	Sex	keep	6	2	1 (7%)
	Ethnicity	discuss	5	2	3 (21%)
LV morphology & texture	IVST	keep	6	1	0 (0%)
	PWT	keep	6	1.5	0 (0%)
	Biventricular hypertrophy	keep	6	1.75	0 (0%)
	LV Mass	discuss	5.5	2	0 (0%)
	RWT	discuss	5.5	2.75	0 (0%)
	Granular sparkling	discard	5.5	3	0 (0%)
	Eccentricity index (IVS / PW thickness)	discard	4	3	5 (36%)
LV systolic function & deformation pattern	GLS	keep	6	1	0 (0%)
	Bull-eye pattern	keep	6	3.5	0 (0%)
	RELAPS (relative apical sparing)	keep	6	1	1 (7%)
	Basal strain	discuss	6	1	3 (21%)
	A/B strain Ratio	discuss	5.5	1	6 (43%)
	Septal A/B strain Ratio	discuss	5.5	1	8 (57%)
	Mitral s'	discuss	5	2	1 (7%)
	MCF	discard	4	2.5	4 (29%)
	EFSR (LVEF / Strain ratio)	discard	4	2.25	8 (57%)
	MAPSE	discard	4	1	5 (36%)
	LVEF	discard	3.5	2	0 (0%)
LV diastolic function & Left atrium	LA volume	keep	5	1.5	0 (0%)
	E/A	discuss	5.5	2	0 (0%)
	DT	discuss	5	2	1 (7%)
	E/e'	discard	4	2	1 (7%)
	MPI (myocardial performance index)	discard	2	0.75	8 (57%)
Valvulopathies	SVi	keep	6	2	0 (0%)
	LFLG AS	keep	6	1.5	0 (0%)
	Mean gradient	keep	5	1	1 (7%)
	Other valvulopathies	discuss	5	1.5	2 (14%)
Right heart & pericardium	RVWT (right ventricle wall thickness)	keep	6	0	0 (0%)
	Pericardial effusion	keep	6	2.5	0 (0%)
	IAS (interatrial septum thickness)	keep	5	2	1 (7%)
	PAHT	discuss	4	1	1 (7%)
	RA (right atrium) enlargement	discard	5	2	1 (7%)
	TAPSE	discard	4	1.25	2 (14%)
	Tricuspid s'	discard	3	2	1 (7%)

\*Rule: **Keep** if median  $\geq 5$  AND  $< 20\%$  of grades  $\leq 2$  AND  $\leq 2$  "no opinion", **Discard** if median  $< 5$  AND  $< 20\%$  of grades  $\geq 5$ , **Discuss**: else. + one level below if visual grade distribution in not normal