



Scottish
Lipid
Forum



ROYAL
COLLEGE of
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EDINBURGH

SCOTTISH LIPID FORUM & SHARP HYBRID MEETING 2021

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ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

SUMMARY

Causal AI: Personalising Estimation of Cardiovascular Risk Based on Cumulative Exposure to the cause of Atherosclerosis **Professor Brian Ference**

Summary by Dr Michelle Collister-Bartlett

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- LDL gets trapped in endothelium wall causing inflammation of the wall and progression of atherosclerosis.
 - Cardiovascular Risk is directly proportional to the cumulative exposure to LDL
 - Prevent cardiovascular deaths by minimising cumulative LDL exposure
 - Yet we treat at thresholds above a target risk – it would make more sense to slow plaque progression and corresponding risk trajectories by treating early which can decrease risk by 2-3 fold. Thus, aim to treat early by reducing LDL and BP which can dramatically reduce the lifetime risk of cardiovascular events by 80% or more – suggestion is to estimate lifetime risk not just the 10 year risk of an event and treat earlier.
 - QRISK algorithm currently underestimate clinical and cost effectiveness of prevention, suggestion is that we should calculate 'QRISK' lifetime risk, as QRISK2/3 underestimate the risk of lifetime exposure to LDL and raised SBP.
 - Approach is to estimate lifetime and short-term risk (using causal risk artificial intelligence (AI)) to aid decisions regarding the benefit of lowering LDL/SBP, they showed by starting inclisiran at age 40 is much more effective at once yearly dose than using twice yearly dose later in life at reducing cardiovascular risk.
 - Can also estimate the rate of rise in HbA1c and the patient's weight for development of pre diabetes so you can tell patients a target weight that the patient will unlikely develop pre diabetes, and AI will be able to tell patients effectiveness of treatment if it was started at different ages.
 - Thus, patients can be given a target e.g. SBP levels, LDL levels, activity levels, weight in order to keep their risk at a certain level. If they wanted to start their goals later, they will get information showing them how much more aggressive they will need to be with respect to goals.
 - For those that don't engage – the suggestion is to bombard them with IT messages – and then depending on how they engage with the data alter what messages are sent to the patient to encourage further engagement in disease prevention.
 - The future (as soon as Spring) will use AI to allow patients to determine their lifetime risks and effect on risk on alteration of weight, BP, LDL and date of onset of medication.