

**From:** [Alicia Jenkins](#)  
**To:** [Committee, Health \(REPS\)](#)  
**Subject:** RE: [SEC=OFFICIAL] RE: [EXT] - RE: Files relevant to request re technology use benefits for people with Type 1 diabetes from Baker Heart and Diabetes Institute team  
**Date:** Monday, 18 December 2023 11:15:47 AM

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OFFICIAL

Dear Kate,

On behalf of the Baker team (Prof Jonathan Shaw and A/Prof Neale Cohen) please find attached the requested bibliography related to the previously sent 4 PDFs.

All the best,  
Alicia

**Professor Alicia Jenkins** MBBS, MD, FRACP, FRCP  
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**Clinical Research Domain Head**  
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*I acknowledge the Traditional Owners of the land on which Baker Institute (Melbourne) resides, the Boon Wurrung peoples of the Yaluk-ut Weelam clan. I pay my respects to all elders past, present and future.*



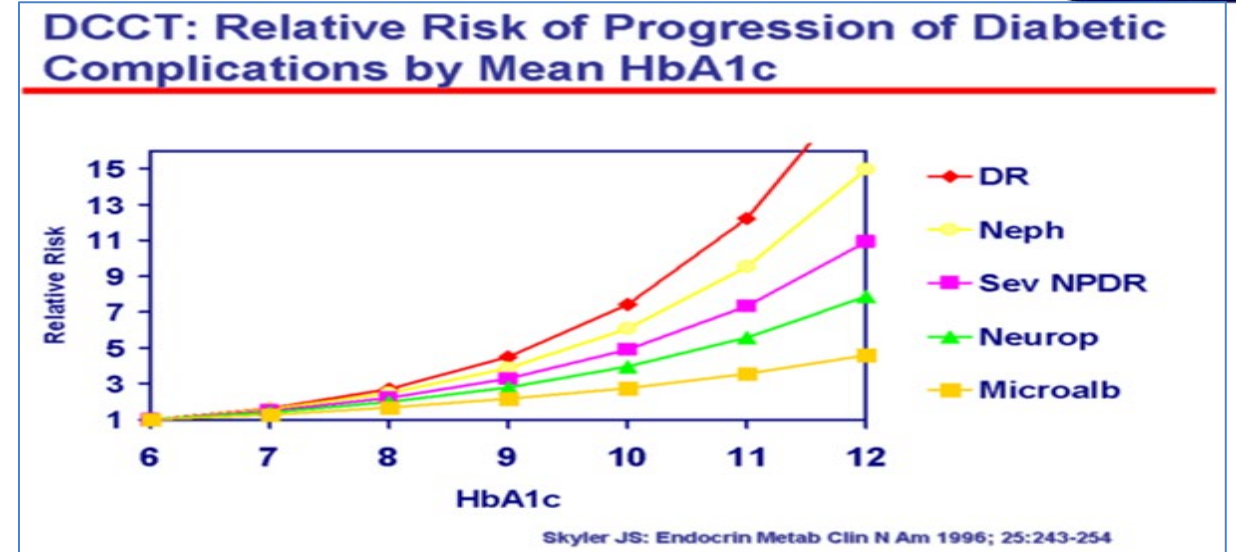
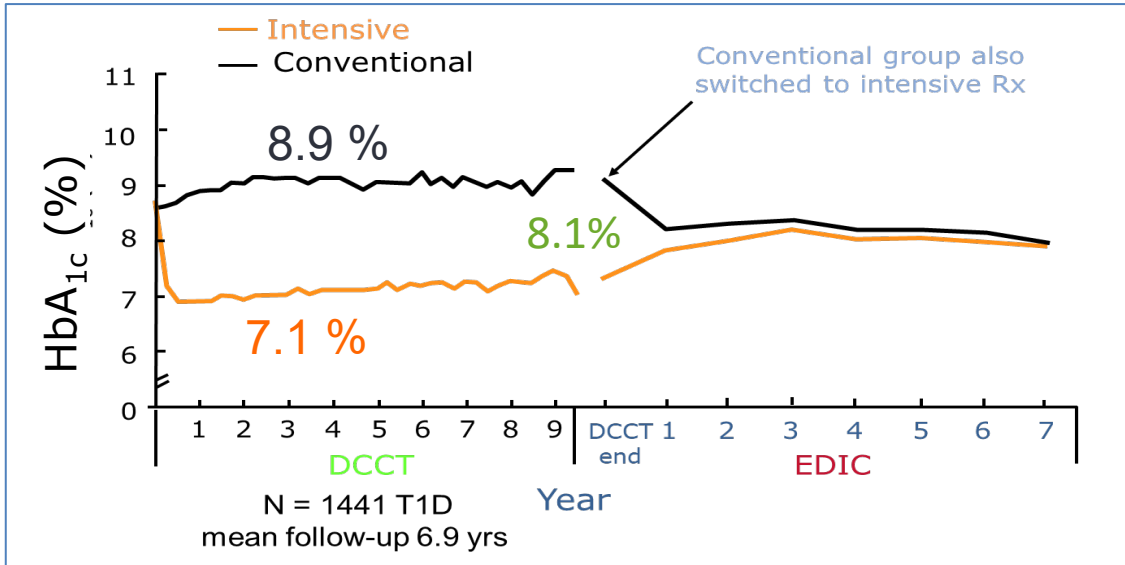


**Bibliography related to glycaemia and technology use for people with Type 1 diabetes related to manuscripts submitted by the Baker Heart and Diabetes Institute team (Jenkins A, Cohen N, Shaw J).**

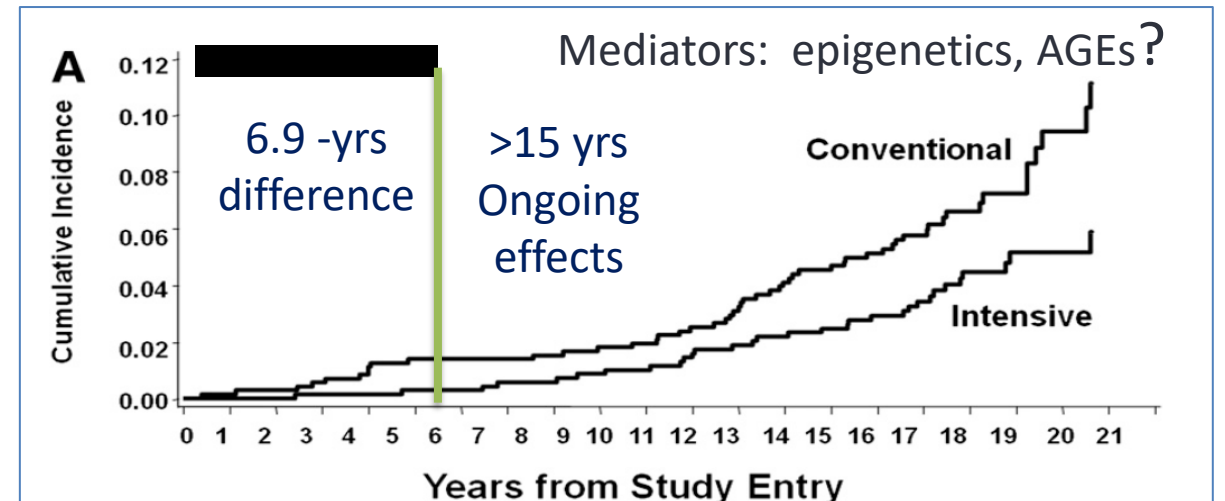
- 1: Nathan DM. Realising the long-term promise of insulin therapy: the DCCT/EDIC study. *Diabetologia*. 2021 May;64(5):1049-1058. doi: 10.1007/s00125-021-05397-4. Epub 2021 Feb 6. PMID: 33550441.
- 2: Zabeen B, Craig ME, Virk SA, Pryke A, Chan AK, Cho YH, Benitez-Aguirre PZ, Hing S, Donaghue KC. Insulin Pump Therapy Is Associated with Lower Rates of Retinopathy and Peripheral Nerve Abnormality. *PLoS One*. 2016 Apr 6;11(4):e0153033. doi: 10.1371/journal.pone.0153033. PMID: 27050468; PMCID: PMC4822832.
- 3: Steineck I, Cederholm J, Eliasson B, Rawshani A, Eeg-Olofsson K, Svensson AM, Zethelius B, Avdic T, Landin-Olsson M, Jendle J, Gudbjörnsdóttir S; Swedish National Diabetes Register. Insulin pump therapy, multiple daily injections, and cardiovascular mortality in 18,168 people with type 1 diabetes: observational study. *BMJ*. 2015 Jun 22;350:h3234. doi: 10.1136/bmj.h3234. PMID: 26100640; PMCID: PMC4476263.
4. Virk SA, Donaghue KC, Wong TY, Craig ME. Interventions for Diabetic Retinopathy in Type 1 Diabetes: Systematic Review and Meta-Analysis. *Am J Ophthalmol*. 2015 Nov;160(5):1055-1064.e4. doi: 10.1016/j.ajo.2015.07.024. Epub 2015 Jul 23. PMID: 26210869.

# DCCT Trial: Less Long-term Complications With Better HbA1c

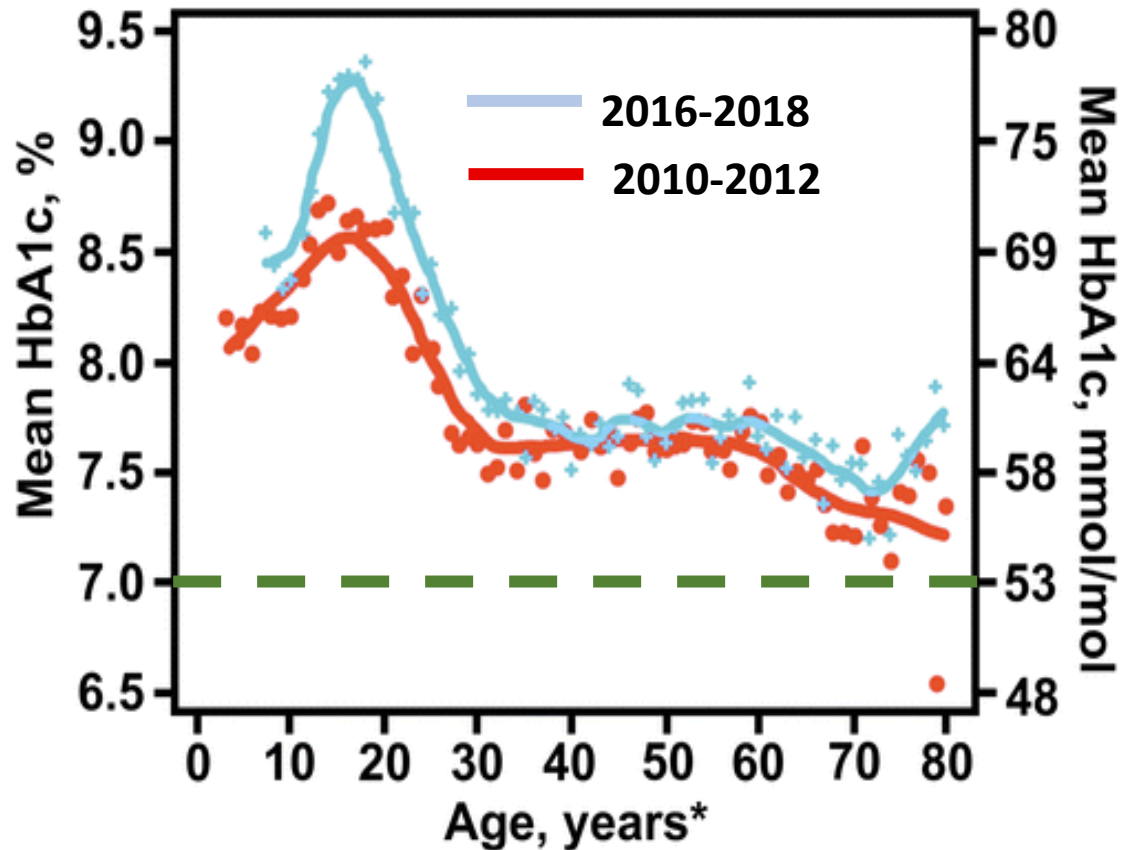
## EDIC Observation: Metabolic Memory



Complication	↓ in DCCT	↓ in EDIC
Retinopathy	26 – 76 %	72 – 77%
Nephropathy	39 – 54 %	53 – 82 %
CVD	41% (n.s)	42%



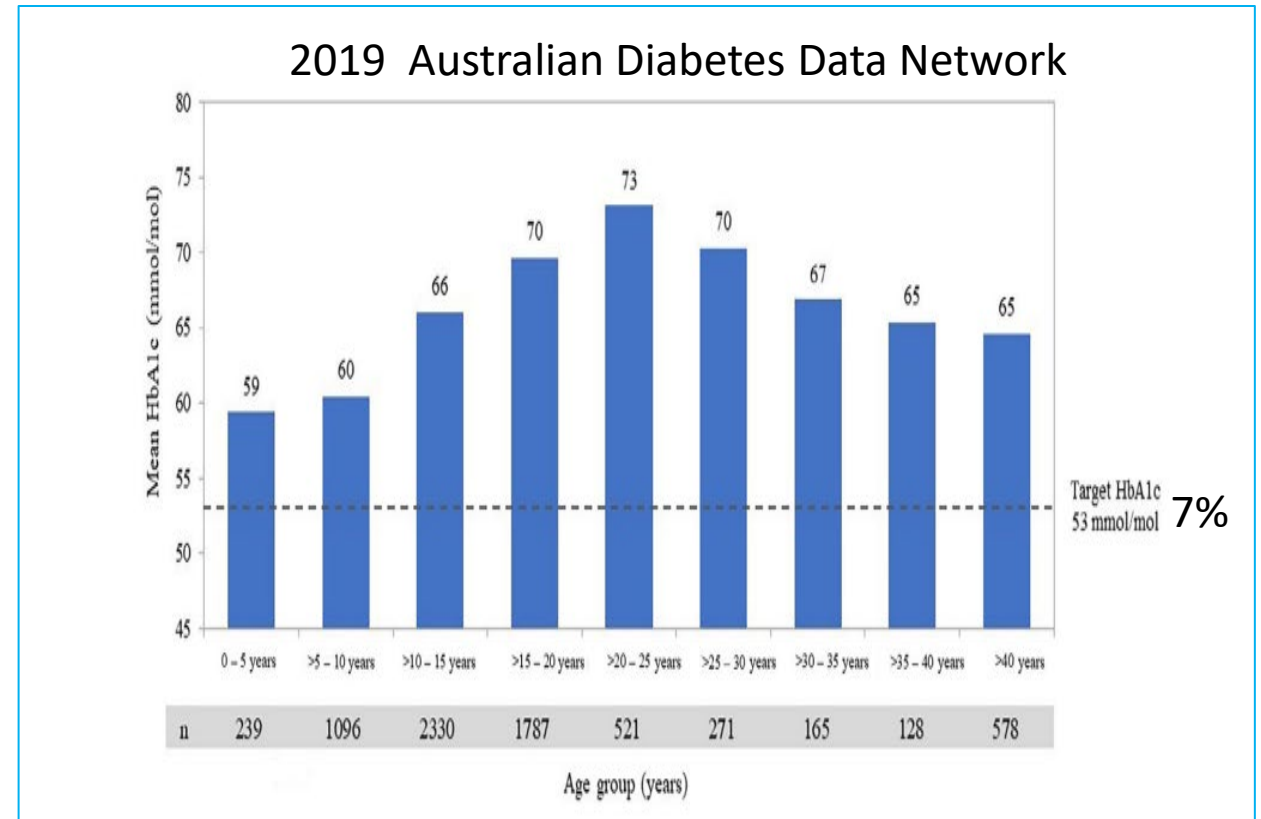
# Suboptimal Mean HbA1c (>7%) in T1D All Ages USA and Australia



N = 22,697

US T1D Exchange

Foster et al. Diabetes Tech. + Therapeutics. 2019



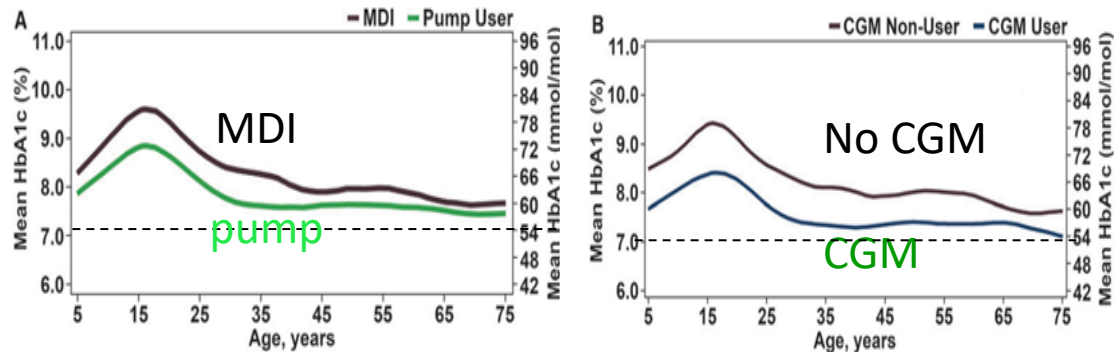
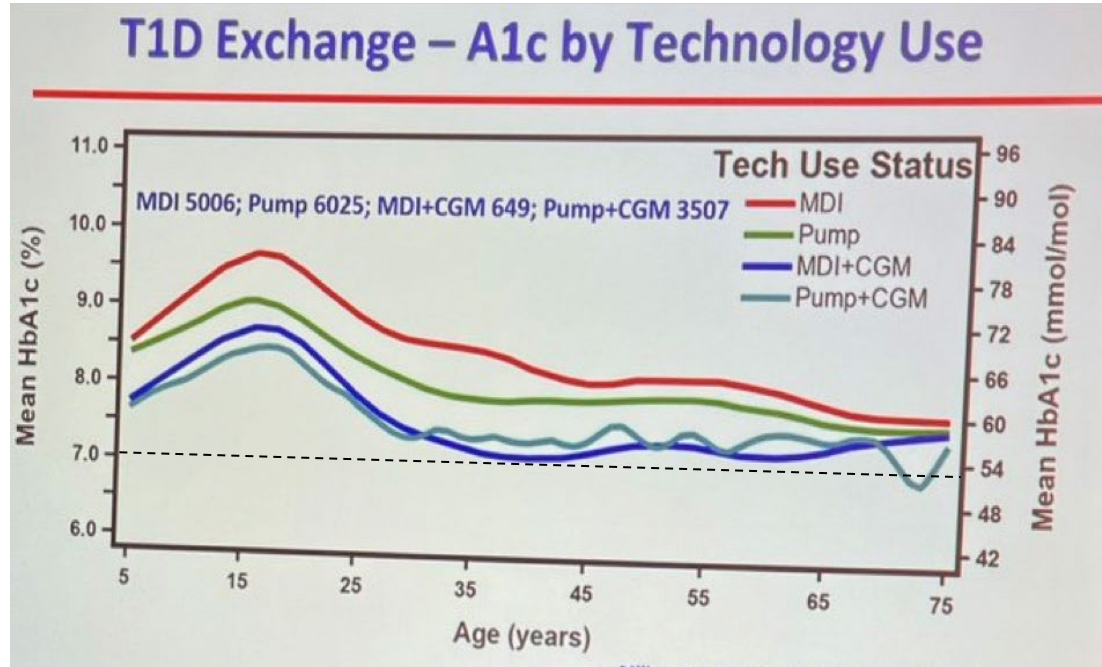
N = 7988, median (IQR) age 15.3 (10) yrs, yrs T1D 5.7 (9.4)

**Mean HbA1c 8.2 % HbA1c <7% in 18% youth, 13% adults**

36% CSII: mean (SD) HbA1c 8.0 (1.3) vs 8.3 (1.7) %, p <0.001

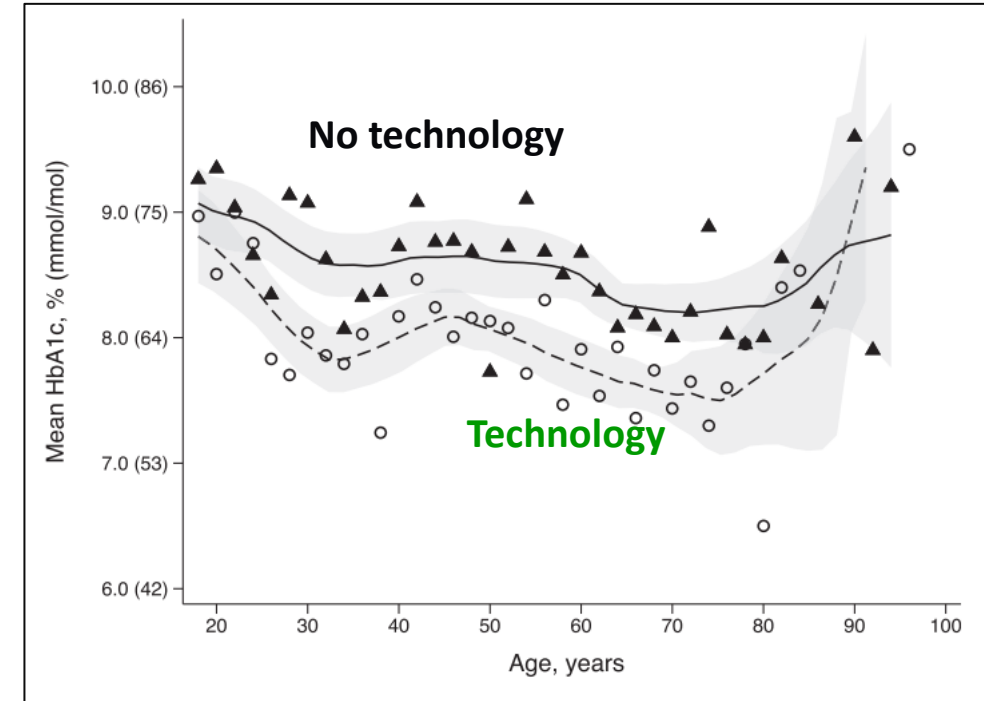
# Better HbA1c With Technology Use At All Ages

USA



Miller et al. Diab Technol Ther 2020

Australia



N = 1693, 27% pumps, 23% CGM

	HbA1c % Mean (SD)
CGM alone	8.3 (1.6)
Pump alone	8.2 (1.4)
Pump + CGM	<b>7.8 (1.4)</b>
No technology	<b>8.6 (1.8)</b>

Pease A, Diabetes Research Clinical Practice, 2021

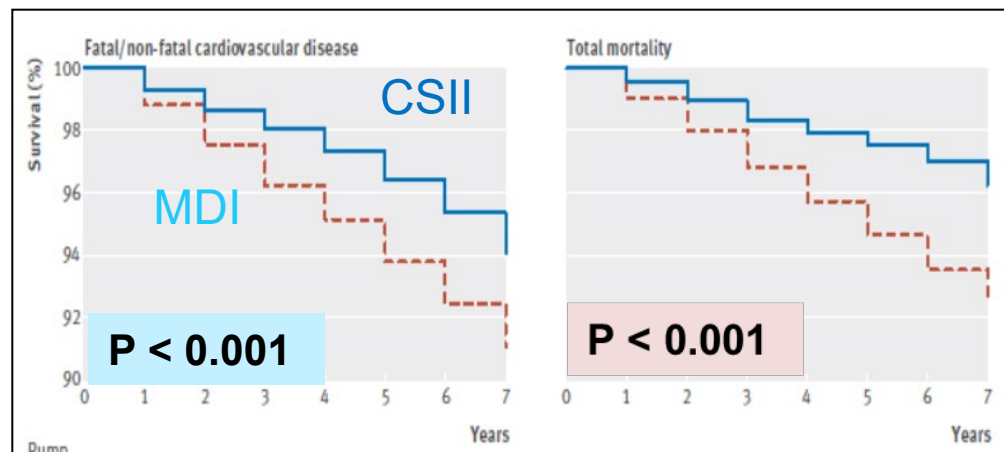
# Less Vascular Complications With CSII Use in T1D Even For the Same Mean HbA1c

Insulin pump therapy, multiple daily injections, and cardiovascular mortality in 18 168 people with type 1 diabetes: observational study

BMJ 2015

Isabelle Steineck,<sup>1</sup> Jan Cederholm,<sup>2</sup> Björn Eliasson,<sup>3</sup> Araz Rawshani,<sup>4</sup> Katarina Eeg-Olofsson,<sup>3</sup> Ann-Marie Svensson,<sup>4</sup> Björn Zethelius,<sup>5,6</sup> Tarik Avdic,<sup>4</sup> Mona Landin-Olsson,<sup>7</sup> Johan Jendle,<sup>8</sup> Soffia Gudbjörnsdóttir<sup>3,4</sup> the Swedish National Diabetes Register

- 2441 on CSII vs 15727 MDI
- mean 6.8 yrs follow-up, similar HbA1c
- **HR 0.55** (95% CI 0.36 to 0.83) fatal CHD  
**0.58** (0.40 to 0.85) fatal CHD or stroke  
**0.73** (0.58 to 0.92) all cause mortality



- CSII less hospitalisations  $\geq 3$  severe hypos

## Diabetic Retinopathy

- Meta-analysis 24 studies, n = 9302
- Incident DR less with CSII  
**RR 0.45**; 95% CI 0.24-0.83  
independent of HbA1c

Virk S, Am J Ophthalmol 2015

## Prospective Observational Study

- n=989, age 12 – 20 y, T1D > 5y
- Equal HbA1c  $\approx 8.7\%$

- **Diabetic Retinopathy**  
**OR 0.66**; 95% CI 0.45-0.95

- **Peripheral neuropathy**
  - **OR 0.63**; 95% CI 0.42-0.95
  - Both p < 0.03

Zabeen B, Plos One 2016

# Why Less Complications With CSII vs MDI?

- Lower insulin dose – often 20 – 30% less than on MDI
- Better HbA1c
- Less hypoglycaemia
- Less glucose variability
- Less inflammation and oxidative stress?



# Contacts if further information desired

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