

# 'Rebooting' retired endocrinologists to provide vital diabetes care

*A large shortage of practicing endocrinologists in the US severely compromises the care of patients with diabetes mellitus. Dr Richard Santen at the University of Virginia School of Medicine, US, is encouraging fellow retired endocrinologists to step in to help, especially in financially challenged rural areas without access to comprehensive healthcare. His solution: 'rebooting' those endocrinologists with the use of telemedicine. The success and cost-effectiveness of his programme suggest it can work globally.*

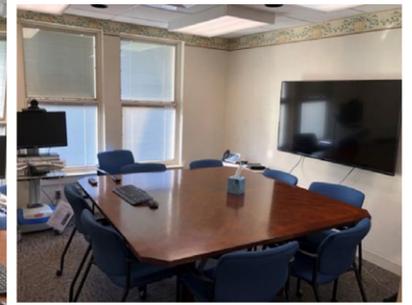
According to the Centers for Disease Control, rates of diabetes mellitus in the US are increasing rapidly. This is placing a tremendous burden on healthcare systems. But what about those living in financially challenged rural areas without access to comprehensive healthcare? One retired endocrinologist in the state of Virginia has initiated an uncomplicated but efficient treatment and support programme for people with diabetes that can be rolled out to other underserved areas, not only nationwide but globally.

Dr Richard Santen is professor emeritus in the Division of Endocrinology, Department of Medicine at the

University of Virginia School of Medicine, US, and the pioneer of a programme to get fellow retired endocrinologists back into the game. Endocrinologists are critical in the fight against diabetes because they specialise in the role of insulin in the body. Practising endocrinologists are part of the US healthcare system dealing with the fallout of the obesity epidemic. But it's a system that prioritises urban areas with high-density populations. Those living in financially challenged rural areas are underserved by the healthcare system. They can live far away from medical facilities or can't afford the necessary transportation, and because job opportunities are few, they often cannot afford healthcare or health insurance. For Santen, these are the kind of people who would benefit most from the skills and experience of retired endocrinologists. The challenge: getting those endocrinologists to where they are needed. That's where the genius of Santen's programme comes into play.

## REACHING FINANCIALLY CHALLENGED RURAL AREAS

Santen's solution is wonderfully simple: telemedicine. In the US, many endocrinologists, like other medical specialists, are encouraged to retire in their mid-60s when – to invoke a car metaphor – they still have plenty of tread on their tyres. They have decades of experience and insight and often still have an urge to remain involved



Conference room and setup. An essential part of the programme is the weekly telephone call with the endocrinologist.



Case manager uses telemedicine to reach patients with diabetes in underserved areas of Virginia.



Tri-area facility primary care provider, southwest Virginia: reaching patients with diabetes in underserved areas.

somehow in the care of patients. They may no longer have the motivation to fully practice but have time to see patients. If they have pensions, they may no longer need to earn, but would draw the line at incurring high costs and the rigours of travel. These were the conditions Santen found himself in when he retired from the University of Virginia and transitioned to emeritus professor. He wondered if he couldn't use the technical benefits of telemedicine – internet- and telephone-based health programmes – to reach patients with diabetes in underserved areas of his home state.

South-west Virginia is emblematic of the many financially challenged rural areas across the US. Incomes are well below the national average. According to the international fundraising network United Way, more than half of households in the area either live in poverty or earn less than the basic cost of living. Healthcare is provided by a small network of federally-funded health centres. Santen approached six of these centres with the proposal that, with their input, he start a six-month, time-limited, telemedicine self-management, treatment and support

programme. It was sorely needed – only three endocrinologists practice within an 80km radius of the 6,100 diabetes patients in the area.

That was five years ago, and Santen and the healthcare staff on the programme have learned a lot since then. Although the idea seemed relatively straightforward at onset, ensuring it was efficient and cost-effective introduced complexities

## Caring for people with diabetes in financially challenged, medically underserved rural areas requires a significant team effort.

that needed addressing. To date, 268 patients in south-west Virginia have been referred to the programme. Of these, 50 are still on it, and 139 have completed it with an average reduction in glycated haemoglobin – an indication of average blood sugar levels – from 10.3% ( $\pm 1.94\%$ ) to 7.8% ( $\pm 1.51\%$ ); the target for people with diabetes is 6.5% to 7% or higher depending on the patients age and co-morbidities.

Approximately thirty per cent of those referred to the programme dropped off. That was, to a degree, expected. But Santen is now confident that he has a programme structure and flow that should encourage endocrinologists to use modern telemedicine to re-enter practice and solve the workforce gap in diabetes management, or as Santen describes it: 'reboot'.

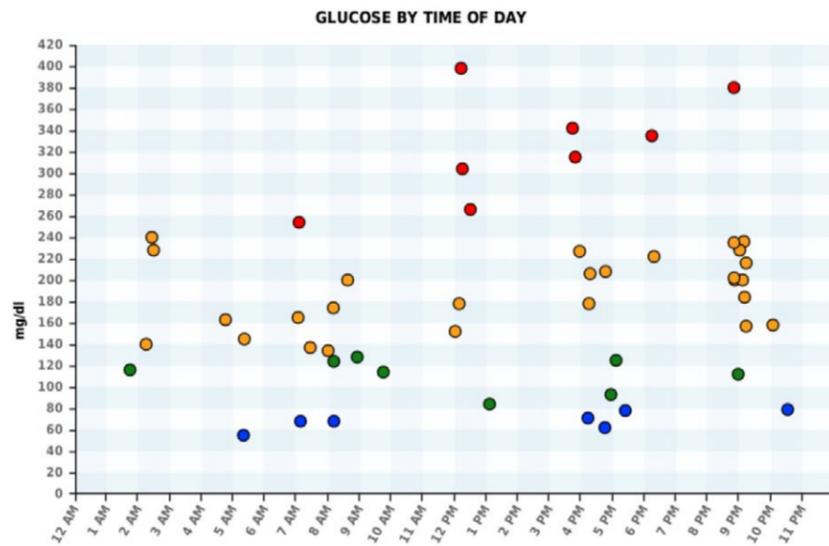
## HOW THE PROGRAMME WORKS

Santen's programme works like this: a primary care provider (PCP) at a participating clinic refers a patient with uncontrolled diabetes to the programme and emails detailed records to the endocrinologist, including the patient's medical history and a physical exam, all imaging studies, and laboratory data. The information is sufficiently detailed that the endocrinologist does not need to examine the patient physically. The patient then comes into the clinic, which has suitable videoconferencing facilities, for a consultation, which

the endocrinologist performs once they have reviewed all the data. The endocrinologist – using easily-available dictation software if necessary – then provides the clinic with a bespoke treatment regime for the patient, including measuring their blood glucose four times a day.

A key player at this point is a certified diabetes care and education



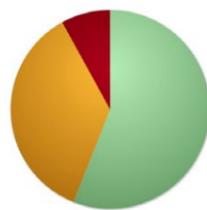


GLUCOSE STATISTICS mg/dl	Overall	Morning		Afternoon		Evening		Bedtime	Overnight
		6AM-9AM	9AM-11AM	11AM-2PM	2PM-5PM	5PM-7PM	7PM-10PM	10PM-12AM	12AM-6AM
HIGHEST	398.0	254.0	114.0	398.0	342.0	335.0	380.0	158.0	240.0
MEDIAN	176.0	135.5	114.0	222.0	206.0	173.5	202.0	118.5	145.0
MEAN	181.7	145.2	114.0	230.3	189.1	190.0	213.6	118.5	155.3
STANDARD DEVIATION	83.5	56.7	0.0	114.1	100.5	113.8	66.2	55.9	63.9
LOWEST	55.0	68.0	114.0	84.0	62.0	78.0	112.0	79.0	55.0
# OF READINGS	50.0	10.0	1.0	6.0	9.0	4.0	11.0	2.0	7.0
% HYPOGLYCEMIC	14.0	20.0	0.0	0.0	22.2	25.0	0.0	50.0	14.3
% ABOVE TARGET	70.0	60.0	0.0	83.3	66.7	50.0	90.9	50.0	71.4

To date, 268 patients in south-west Virginia have been referred to the programme. Of these, 50 are still enrolled and 139 completed it, with an average reduction in glycated haemoglobin – an indication of average blood sugar levels – from 10.3% (± 1.94%) to 7.8% (± 1.51%).

specialist (CDCES). They are the link between the endocrinologist and the PCP – they help gather a patient's demographic and lifestyle data, review medication information with the endocrinologist using a standardised form, and obtain vital signs.

An essential part of the programme is the weekly telephone call with the endocrinologist, for which a patient calls Santen at a specific time and day and provides glucose readings for the past week. A patient could also upload these readings should they have sufficient internet access. Based on these readings, the endocrinologist adjusts medications, if necessary, each time working through the relevant clinic's CDCES. Each patient follows this procedure for six months; after that, the patient remains in the care of their PCP and is fully trained in self-management of diabetes. Interestingly, in the five years of Santen's programme, none of his patients' glycated haemoglobin levels returned to their pre-programme levels during a six- to 18-month follow-



The programme involves intensive glucose-management strategies.

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up after being discharged from the programme; most mainly remained unchanged from their improved levels.

Developments in telemedicine technology have helped evolve the programme from its original design.

It now includes app-based blood-glucose monitoring, secure patient videoconferencing facilities, and group education programmes and follow-up sessions using videoconferencing.

### KEY LESSONS LEARNED

Santen says he has learned several key lessons, the first being that caring for people with diabetes in financially challenged, medically underserved rural areas requires a significant team effort. Patients in such areas face considerable challenges, and support is therefore vital. While a consulting endocrinologist makes a significant difference, even if they're virtual, they must work closely with PCPs and CDCESs. Nutritionists are also key players in the team, as are interpreters for patients who don't speak English, and clinic communications and admin personnel.

Another lesson is that a telemedicine self-management programme can work, and not only the patients benefit. For retired endocrinologists, the opportunity to actively practise again – at a pace and with a workload they dictate – allows them to remain in the game and help patients, without the demands of a full-day job or the annoyances of travel. They get satisfaction without the stress.

But where Santen's retired endocrinologists 'reboot' programme offers truly significant value is the fact that it is cost-effective and relatively easy to scale up. Santen points to a telemedicine centre for a rural Masai village in Tanzania as an example of the reach of the technology. Developments in telemedicine technology have made it increasingly affordable and easier to access. All diabetes patients need is

a simple smartphone and occasional access to a clinic with teleconferencing facilities. Such efficacy and cost-effectiveness are attractive to investors and funders, which means while the idea may have had its seed in south-west Virginia, it can reach across the globe.



# Behind the Research

## Dr Richard Santen

E: [rjs5y@virginia.edu](mailto:rjs5y@virginia.edu) T: +1 434 806 2521



### Research Objectives

Richard Santen offers a solution to improve the care of patients in rural, underserved areas through 're-booting' endocrinologists and telehealth.

### Detail

#### Address

Dr Richard Santen, PO Box 350  
Huddleston, Virginia 24104, USA

#### Bio

Dr Richard Santen is a professor emeritus in the Division of Endocrinology, Department of Medicine, at the University of Virginia School of Medicine. He is a past

president of the Endocrine Society and has received the Koch award of that society in recognition of lifetime achievement. He has written over 400 peer reviewed articles and chapters which have been cited in the medical literature 32,000 times. On his partial retirement five years ago, he began the diabetes self-management programme.

#### Funding

- Main Street Program, University of Virginia
- The Center for Diabetes Technology, University of Virginia

#### Collaborators

- Ms Cindy Cunningham, CDCES
- Ms Carla Horton, CDCES
- Dr Ralph Nass

### References

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### Personal Response

#### How would you like to see your retired endocrinologists 'reboot' programme in the next five years?

“The federally qualified health clinic system in the US is funded by the government at a level of 6 billion dollars per year. This programme supports a total of 1,300 clinics in rural, underserved areas and provides the infrastructure needed to support six month self-management programmes. This includes financial support sufficient to pay for the certified diabetes educations, sliding scale fees for patient management, administrative personnel, and laboratory and radiologic costs. This system provides the means to support retired endocrinologists and to relieve them of the full burden of practice at the level of time commitment that they are comfortable with. Over the next five years, I would like to see this programme expanded to 50 clinics with the recruitment of 20 retired endocrinologists.”

