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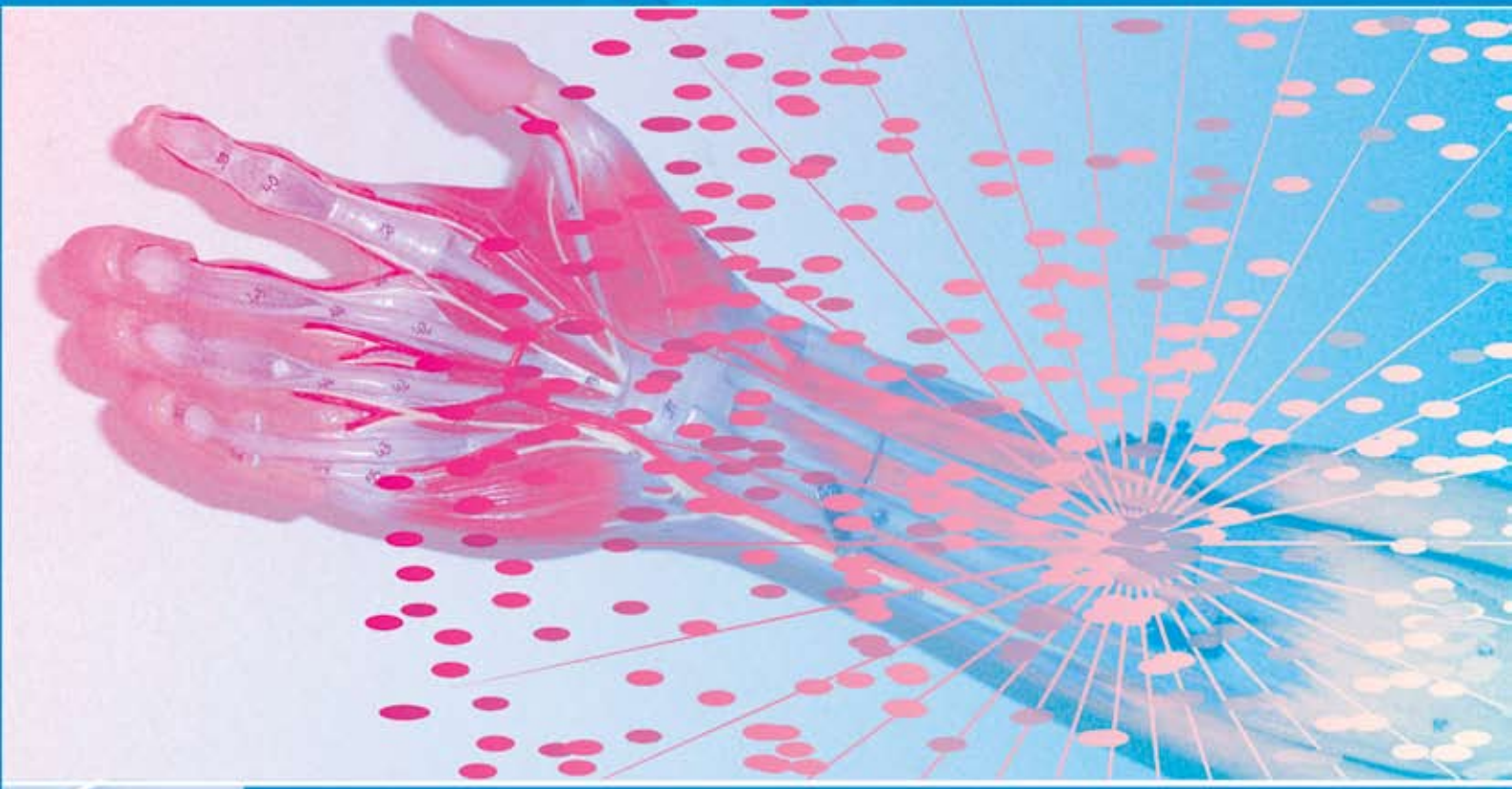

A Peer Reviewed International Journal for the Advancement of Clinical Skills
- 'docendo ac discendo' - 'by teaching and learning'

In this issue:

Executive Board

IJOCS
DOCENDO AC DISCENDO

International Journal Of Clinical Skills
P O Box 56395
London
SE1 2UZ
United Kingdom

E-mail: info@ijocs.org
Web: www.ijocs.org
Tel: +44 (0) 845 0920 114
Fax: +44 (0) 845 0920 115

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The International Journal of Clinical Skills looks forward to contributing positively towards the training of all members of the healthcare profession.

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Foreword

Globalisation and Clinical Skills

The International Journal of Clinical Skills (IJOCS) – the new road to new skills? Maybe – but it has certainly opened a platform for the globalisation of clinical skills. The World Health Organisation's (WHO) programme on globalisation targets public health risks, security and outcomes. Driven by the concept of "global public goods" and cross-border health risks, the underpinning issue is to promote health for the poor by way of achieving national health targets. As with the IJOCS, the WHO strategy seeks new technologies in the clinical arena to provide investigative tests – with the WHO being particularly interested in those tests which are suitable for developing countries along with new drugs for endemic diseases. The aims are indeed noble. Investigative and therapeutic technologies create a vacuum for the dissemination, sharing and globalisation of clinical skills, which remain the main asset and commodity which clinicians of poorer nations exercise, promote and share. The IJOCS has released a bolt for health professionals to do just that – share knowledge.

The provisions of the healthcare industry in developed countries by sheer volume and demand, streamlines clinical skills into sub-specialised areas. Clinicians (medical, paramedical and nursing) in these areas gain clinical expertise that are unique to their field and emerge from rich patient-clinician interactions. The clinical skills of dealing with children with disabilities, rehabilitation medicine and terminal care are mere examples that are deficient in the poorer health economies that spend the best part of their human resources to combat diseases of malnutrition and poor sanitation.

The IJOCS provides a global resource centre for sharing and promoting clinical skills between clinicians and health professionals. Senior clinicians, who practiced medicine during the last four decades, will have recognised a gradual and progressive pattern of dependence on technologies with less reliance on clinical skills. The IJOCS provides a platform for sharing and debating the inter-phase and interactions between new technologies and clinical skills. It promotes the development of a new layer of clinical expertise that will emerge from the interpretation, application and/or exclusion of new technologies, for the benefit of clinical care.

I trust that clinicians practicing in poorer health economies will enhance the Journal by sharing their clinical skills and knowledge. Their special expertise of managing clinical needs, within restricted resources, expectedly stimulates the human ingenuity and creativity, leading to the development of clinical skills suitable for each unique circumstance. I, for one, will be actively supporting the IJOCS innovative approach to collaboration of skills. The IJOCS will provide a vehicle for the transmission of these skills across the globe for sharing expertise between different health economies to enrich the overall clinical skills arena.

Hippocrates recognised the professional responsibility of the individual clinician by stating that physicians "must have a wealthy …medical knowledge, clinical skills, medical ethics, interpersonal skills,…". The IJOCS improves the physician's opportunity to enhance his/her clinical skills "by teaching and learning".

Dr Atef R Markos FRCOG FRCP

i-DREAM Project: Interactive Diabetes Research Evidence Application in Management

L Varadhan
Princess Royal Hospital NHS
Telford

A Gopinath
Project Manager
Diabetes Centre
George Eliot Hospital NHS Trust

K K Garadi
Hull Royal Infirmary

L Pichaipillai
Diabetes Centre
George Eliot Hospital NHS Trust

S Shaikh
Diabetes Centre
George Eliot Hospital NHS Trust

J R Morrissey
Diabetes Centre
George Eliot Hospital NHS Trust

V Patel
Diabetes Centre
George Eliot Hospital NHS Trust
Associate Professor of Clinical Skills
Institute of Clinical Education
Warwick Medical School
University of Warwick

Correspondence:
Dr Vinod Patel
Consultant Physician and Endocrinologist
Diabetes Centre
George Eliot Hospital NHS Trust
College Street
Nuneaton
CV10 7DJ
UK

E-mail: vinod.patel@geh.nhs.uk
Tel: +44 (0) 2476 351351 Ext 3592
Fax: +44 (0) 2476 865210

KEYWORDS:
Diabetes
Evidence-based medicine
i-DREAM

Abstract

Aim
A major barrier to providing effective healthcare is implementation of research evidence. i-DREAM (**I**nteractive **D**iabetes **R**esearch **E**vidence **A**pplication in **M**anagement) is an interactive educational computer tool that helps clinicians make evidence-based decisions based on individual patient's clinical parameters such as blood pressure (BP), HbA1c% and lipid profile. The aim of the study was to investigate the impact of teaching evidence-based medicine to health care professionals using this program as an educational tool.

Methods
The usefulness of i-DREAM was assessed based on its ability to help clinicians understand the management of 10 important clinical problems, based on implementation of 12 relevant clinical trial/guidelines in diabetes. A complex hypothetical case note was devised with 10 clinical problems to match trial profiles and given to 100 clinicians (2 diabetes nurses, 7 pharmacists and 91 doctors) to identify the clinical problem, recommend a management plan and cite research evidence. 2 points were given for a correct answer, and 1 for a wrong answer or no response. The points for each problem were then multiplied, giving 8 points for a clinical problem solved and hence a Global score of 80 points. i-DREAM was then demonstrated to the participants over a 30 minute session, and the score recalculated based on the same case note within the next 7 days.

Results
At baseline, the clinicians scored 8.0/10 on problem identification and 6.1/10 on management recommendation score. Clinicians were aware of 0.8 trials out of the 12 used. The Pre-i-DREAM Global score was 31.8/80.

After i-DREAM, the problem identification score improved to 9.5/10($p<0.001$) and the management recommendation score to 8.2/10($p<0.001$). Trial awareness improved to 5.4/12($p<0.05$) and global score post-i-DREAM to 52.4($p<0.01$).

Conclusion
i-DREAM can serve as an effective interactive tool to the multi-professional diabetes care team to advise on evidence-based management plans, thereby bridging the gap between daily and desired practice.

Introduction

Evidence-based practice of medicine is described as "the conscientious, explicit and judicious use of current research evidence" in making decisions on care of individual patients, based on skills which allow the doctor to evaluate both personal experience and external evidence, in a systematic and objective manner [1]. The pressure of keeping up to date with evidence base is higher in the field of diabetes, with various trials being published regularly recommending new interventions, and stressing the urgent need for higher standards of care to reduce or delay the development of diabetes related complications. We understand that a major barrier in improving effectiveness of health care is incorporating research evidence into clinical practice. For decades, people have been aware of this fact and its consequences in terms of expensive, ineffective, or even harmful decision making [2, 3].

Twenty English clinical journals dealing with internal medicine published over 6000 articles, forcing the clinician to read 17 articles per day to keep up to date in 1992 [4], with only an hour or less available per week with the clinicians to do the same [5]. Training health care professionals in evidence-based medicine would reduce the variation in clinical practice and bridge the gap between the research evidence and real life practice. Previous reviews have reported that the effectiveness of training available in evidence-based medicine to be grossly inadequate [6]. Only clinically integrated teaching of evidence-based medicine is likely to be more effective in producing changes in skills, attitudes, and behaviour compared to stand alone teaching [7].

Evidence-based medicine is therefore about asking questions, accessing databases, appraising the information available and conceptualizing a management plan to apply in everyday practice. However it may not be practically possible to repeat all these steps as a basis for clinical decision at all consultations [8].

Establishing an electronic database for bringing the evidence base in an accessible and interactive form would not only make consulting, evaluating and applying literature into action a simple and routine practice, but would also help establish standards of care comparable to those achieved in research setting. The difference with using an explicit, evidence-based medicine framework is twofold: it can make consulting and evaluating the literature a relatively simple, routine procedure, and it can make this process workable for clinical teams, as well as for individual clinicians.

Our aim was to investigate the impact of teaching evidence-based medicine to health care professionals using i-DREAM program (**I**nteractive **D**iabetes **R**esearch **E**vidence **A**pplication in **M**anagement) as an educational tool.

Methods

i-DREAM is a free public-domain computer based active and interactive clinical tool that helps clinicians to make evidence-based decisions and provides a comprehensive diagnosis and management plan based on individual clinical parameters. This learner-centered computer program also has links to abstracts and slide presentations of various diabetes clinical trials and hospital guidelines.

The main features of the program are as follows:

- i-DREAM is a computer program that works on Microsoft Excel.
- Various parameters of the patient like height and weight, smoking status, blood pressure, cholesterol, microalbuminuria status, HbA1c%, eye and feet examination status and history of coronary artery disease need to be filled onto one of the columns of the sheet. The parameters are arranged based on the Alphabet Strategy of diabetes care [9, 10].
- The software comes up with the relevant clinical trials that the given parameters match. Various landmark trials in diabetes such as UKPDS [11, 12, 13], CARDS [14], LIFE [15], IRMA [16], STENO 2 [17] have been included in this software.
- It also gives a comprehensive diagnoses and a recommended management plan for the given patient.
- The program has links to educational material on clinical trials and hospital guidelines for management of each of the parameters of diabetes (Figure 1).
- Patient education materials are included for each of the trials in the form of slides/word documents that could be used during consultations.

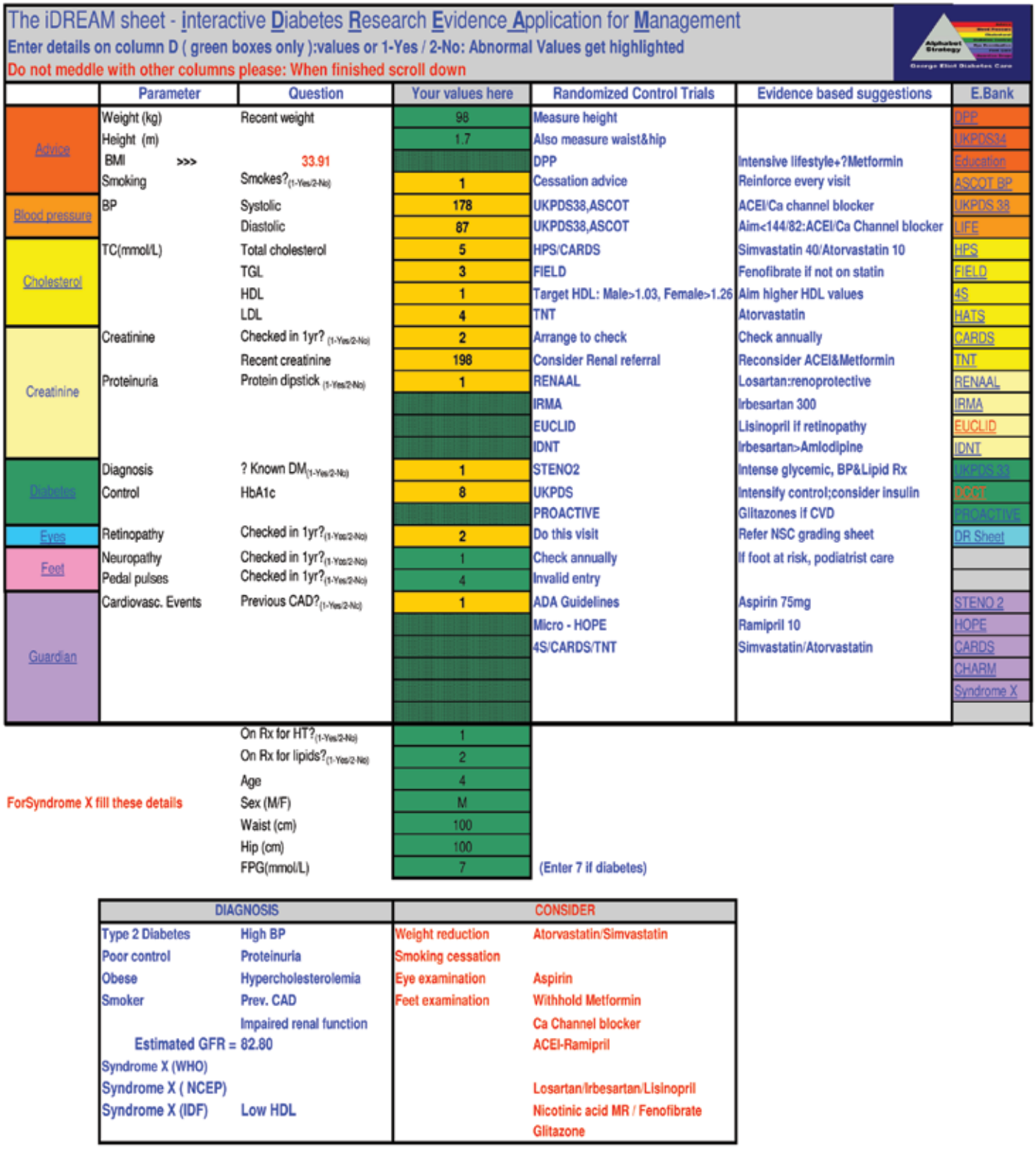
The program has links to the landmark studies in diabetes. The user has the option of viewing each research paper in three different formats

- The original abstract of the trial.
- AT A GLANCE abstract: The **AT A GLANCE** abstract is a one page abstract that stands for **A**-Acronym for the study, **T**- Title including authors and reference, **A**–Aim and background of the study, **G**-Groups studied including inclusion and exclusion criteria, **L**-Limbs and endpoints (e.g. Losartan vs. placebo), **A**-Absolute and relative risk reductions, **N**-Numbers needed to Treat, **C**-Clinical conclusion, **E**-Education for patients. (Appendix 2).
- Microsoft PowerPoint slide presentation: The slide presentations contain important study details including slides on relevant graphical depiction of the results of the trials. Slides have also been included for educating the patient which the clinician can use to explain the management plan to the patient.

The i-DREAM Audit :

A hypothetical complex case note (Appendix 1) was created giving all the relevant parameters of diabetes, containing 10 potential problems in ten main areas of diabetes care that would need attention and intervention if needed (obesity, smoking, high blood pressure, high cholesterol, microalbuminuria, uncontrolled blood glucose, presence of diabetic retinopathy, history of coronary artery disease, aspirin usage and left ventricular hypertrophy - LVH) (Table 1). The clinicians were expected to identify the problem, suggest the clinical trial that provided the relevant evidence base for management of that problem and give the management plan for the clinical issue.

Figure 1: Screenshot of i-DREAM



The iDREAM sheet - interactive Diabetes Research Evidence Application for Management

Enter details on column D (green boxes only):values or 1-Yes / 2-No: Abnormal Values get highlighted

Do not meddle with other columns please: When finished scroll down

	Parameter	Question	Your values here	Randomized Control Trials	Evidence based suggestions	E.Bank
Advice	Weight (kg)	Recent weight	98	Measure height		DPP
	Height (m)		1.7	Also measure waist&hip		UKPDS34
	BMI >>>	33.91		DPP	Intensive lifestyle+?Metformin	Education
	Smoking	Smokes?(1-Yes/2-No)	1	Cessation advice	Reinforce every visit	ASCOT BP
Blood pressure	BP	Systolic	178	UKPDS38,ASCOT	ACEI/Ca channel blocker	UKPDS 38
		Diastolic	87	UKPDS38,ASCOT	Aim<144/82:ACEI/Ca Channel blocker	LIFE
Cholesterol	TC(mmol/L)	Total cholesterol	5	HPS/CARDS	Simvastatin 40/Atorvastatin 10	HPS
		TGL	3	FIELD	Fenofibrate if not on statin	FIELD
		HDL	1	Target HDL: Male>1.03, Female>1.26	Aim higher HDL values	4S
		LDL	4	TNT	Atorvastatin	HATS
Creatinine	Creatinine	Checked in 1yr? (1-Yes/2-No)	2	Arrange to check	Check annually	CARDS
		Recent creatinine	198	Consider Renal referral	Reconsider ACEI&Metformin	TNT
	Proteinuria	Protein dipstick (1-Yes/2-No)	1	RENAAL	Losartan:renoprotective	RENAAL
				IRMA	Irbesartan 300	IRMA
				EUCLID	Lisinopril if retinopathy	EUCLID
				IDNT	Irbesartan>Amlodipine	IDNT
Diabetes	Diagnosis	? Known DM(1-Yes/2-No)	1	STENO2	Intense glycemic, BP&Lipid Rx	UKPDS 33
	Control	HbA1c	8	UKPDS	Intensify control;consider insulin	DCCT
				PROACTIVE	Glitazones if CVD	PROACTIVE
Eyes	Retinopathy	Checked in 1yr?(1-Yes/2-No)	2	Do this visit	Refer NSC grading sheet	DR Sheet
Feet	Neuropathy	Checked in 1yr?(1-Yes/2-No)	1	Check annually	If foot at risk, podiatrist care	
	Pedal pulses	Checked in 1yr?(1-Yes/2-No)	4	Invalid entry		
Guardian	Cardiovasc. Events	Previous CAD?(1-Yes/2-No)	1	ADA Guidelines	Aspirin 75mg	STENO 2
				Micro - HOPE	Ramipril 10	HOPE
				4S/CARDS/TNT	Simvastatin/Atorvastatin	CARDS
						CHARM
						Syndrome X
		On Rx for HT?(1-Yes/2-No)	1			
		On Rx for lipids?(1-Yes/2-No)	2			
		Age	4			
ForSyndrome X fill these details		Sex (M/F)	M			
		Waist (cm)	100			
		Hip (cm)	100			
		FPG(mmol/L)	7	(Enter 7 if diabetes)		

DIAGNOSIS		CONSIDER	
Type 2 Diabetes	High BP	Weight reduction	Atorvastatin/Simvastatin
Poor control	Proteinuria	Smoking cessation	
Obese	Hypercholesterolemia	Eye examination	Aspirin
Smoker	Prev. CAD	Feet examination	Withhold Metformin
	Impaired renal function		Ca Channel blocker
Estimated GFR = 82.80			ACEI-Ramipril
Syndrome X (WHO)			
Syndrome X (NCEP)			Losartan/Irbesartan/Lisinopril
Syndrome X (IDF)	Low HDL		Nicotinic acid MR / Fenofibrate
			Glitazone

Figure 2: Scores Pre and Post i-DREAM

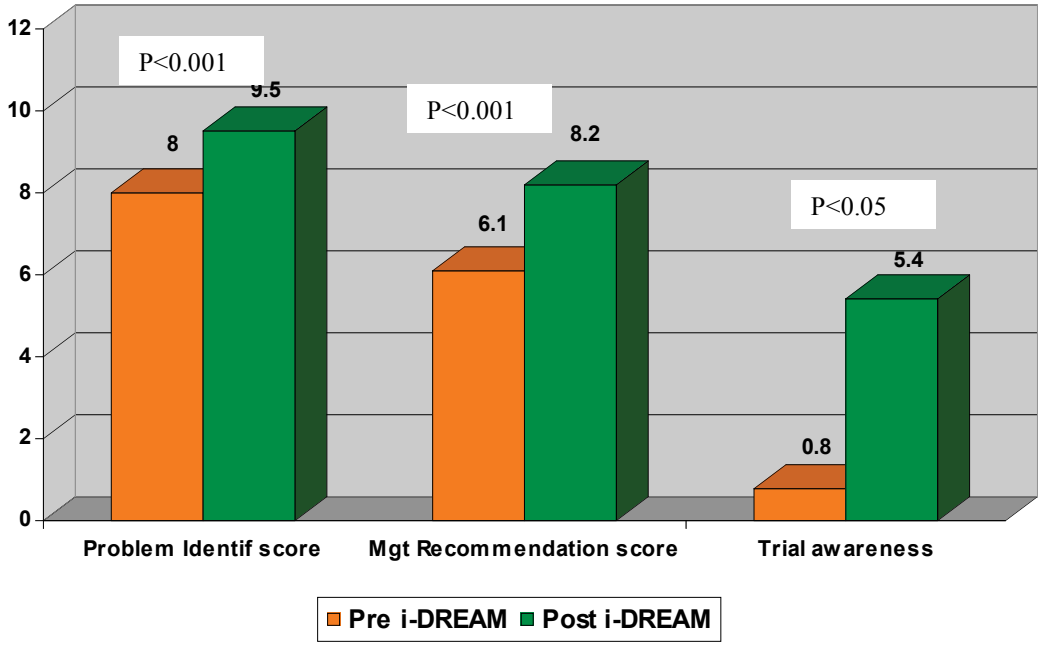


Figure 3: Scores Pre and Post i-DREAM

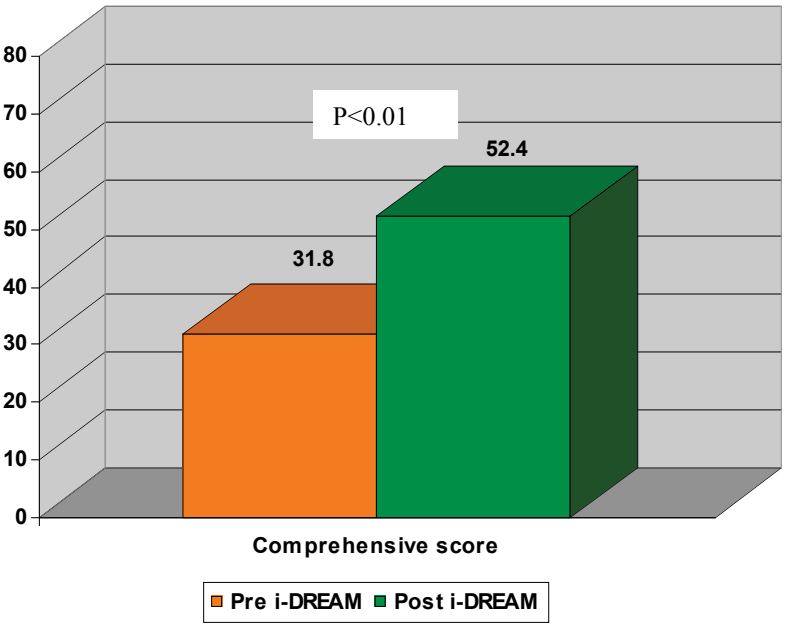


Table 1: Problem list and expected results

	Problems (2 points)	Management (2 points)	Evidence base (2 points)
1	Obesity	Metformin	UKPDS 34
2	Smoking	Cessation advice	Expert guidance
3	Hypertension	ACE inhibitor	UKPDS 38
4	LV hypertrophy	Angiotensin receptor blocker	LIFE
5	Coronary disease	ACE inhibitor	HOPE
6	Hypercholesterolemia	Simvastatin/Atorvastatin	HPS / 4S / CARDS
7	Microalbuminuria	Angiotensin receptor blocker	IRMA
8	Diabetes	Insulin / Metformin	UKPDS
9	Diabetic retinopathy	Annual screening	NSC guidelines
10	**Aspirin** usage	Aspirin	ADA consensus

The case note was then distributed to 100 clinicians (2 diabetes nurses, 7 pharmacists and 91 doctors) actively involved in treating patients with diabetes both as inpatients and outpatients (Table 2).

Table 2: Distribution of clinicians involved in the audit

Position in Diabetes Care	Number
Senior House officers	51
General practitioners / GP Registrars	22
Pre-registration House officers	18
Pharmacist	7
Diabetes Nurse	2

The i-DREAM program was then demonstrated over a 30 to 60 minutes session by one of the members of the i-DREAM group to the participants and various trials explained and evidence-based guidelines reiterated. The session was also used to demonstrate the pattern of working of the program, and mainly ran through 12 clinical trials and guidelines- UKPDS 33 [11], UKPDS 34 [12], UKPDS 38 [13], CARDS [14], LIFE [15], IRMA [16], HOPE [18], 4S [19], HPS [20], Diabetic retinopathy National Screening committee guidelines [21], ADA consensus statement for use of aspirin [22] and NSF for diabetes care [23].

The clinicians were then asked to redo the same hypothetical case note subsequently, within a period no longer than 7 days following the demonstration, during which they had access to the program if needed.

Clinicians were scored independently on each of the following parameters:

- **Problem identification score** (maximum 10): based on ability to identify essential clinical problems such as high blood pressure or microalbuminuria.
- **Management recommendation score** (maximum 10): based on the intervention recommended.
- **Trial awareness score** (maximum 12): based on ability to quote the clinical trials that support the recommended management plan.
- **Global score** (maximum 80): 2 points each were given for problem identification, naming the clinical trial and recommending a correct management plan. The score was then multiplied for each problem giving a maximum score of 8, and calculating it for 10 different problems gave a total score of 80. Since 4S, HPS and CARDS dealt with management of lipids in patients with diabetes, only 2 points were given, even if the clinicians named more than one trial for this problem. However the awareness of these trials counted towards the trial awareness score.

Results

At baseline, the mean Problem identification score was 8.0/10, ranging from 5 to 10, with a median score of 8. Only 11 clinicians managed to spot all the clinical problems in the given case. The average Management recommendation score was 6.1/10, ranging from 0 to 10, with a median of 7. Only 3 out of all the participants managed to get all the 10 possible recommendations right. The Trial awareness score, calculated on the ability to cite the name of the trial on the solution sheet was found to be 0.8/12 trials (range 0-9, median 0), with as many as 78 clinicians not managing to mention even a single trial or guideline on their response sheet. The Pre-i-DREAM Global score as described above was 31.8 out of a maximum possible 80.

After the demonstration of i-DREAM tutorial, there was a significant improvement in all the scores (Table 3). Problem identification score improved to 9.5/10, ranging between 7 and 10 (median 10). 69 clinicians managed to identify all the relevant clinical problems. The average Management recommendation score improved to 8.2/10, ranging between 4 and 10 (median 9) (Figure 2). Again the number of clinicians to get all the management suggestions correct improved significantly to 27. The Trial awareness score improved to 5.4 out of 12, the range being 1 to 12 (median 5). 43 clinicians managed to cite at least half of the clinical trials after the demonstration of the computer program. The post-i-DREAM global score was significantly better at 52.4 (Figure 3).

63 clinicians showed an absolute improvement in all the 3 areas tested, maximum improvement being with trial awareness where 94 clinicians showed an increment in the score. 87 clinicians showed an absolute increase in the global score with a further 9 of the clinicians not showing any change during the audit. The average increase in the Global score was 81%, ranging from -23% to 260%.

Table 3: Results of the various scores of i-DREAM audit

Parameter	Pre i-DREAM	Post i-DREAM	P value
	Score (Range)	Score (Range)	
Problem identification score (Max 10)	8.0 (5-10)	9.5 (7-10)	<0.001
Management recommendation score (Max 10)	6.1 (0-10)	8.2 (4-10)	<0.001
Trial awareness score (Max 12)	0.8 (0-9)	5.4 (1-12)	<0.05
Global score (Max 80)	31.8 (16-80)	52.4 (27-80)	<0.01

Discussion

The global economic burden of diabetes, added with the increasing healthcare costs of treating the microvascular and macrovascular complications associated with it, necessitates an urgent solution to implement available research evidence into everyday practice. This study has shown that i-DREAM has the potential to educate the multi-professional diabetes care team effectively on the available evidence base. It also provides information in an accessible and critically appraised format. The patient information function helps the patient to become more informed about how particular clinical decisions were made.

A pilot of this study was done as an audit on 15 clinicians (PIARE audit – Patient Individualized Application of Research Evidence), where the same hypothetical case was given, followed by distribution of the AT A GLANCE format of the abstracts of 8 clinical trials to the clinicians. The same exercise was repeated and the abstracts were shown to have increased the trial awareness and problem management significantly [24]. This study is an improvement of the above, replacing the paper format with a more sophisticated and interactive, user-friendly computer programme.

It is interesting to note that the clinicians were identifying problems quite consistently. Still the program managed to improve their problem identification skills significantly by 19% (8.0 vs. 9.5, $p<0.001$). This implies that the clinician could pick only 8 out of the 10 available problems and 30% of the clinicians were below the median. Problem identification is of paramount importance in diabetes, as this not only facilitates effective management plans, but also is the initial window of opportunity to start matching the problem with the evidence base. The i-DREAM program, with the comprehensive diagnostic list at the bottom, helps the clinicians to have a complete list of problems of a current patient, and hence prompts about the intervention that these may warrant.

The Management recommendation score improved considerably by 34% after the demonstration of the i-DREAM tool (6.1 vs. 8.2, $p<0.001$). The average score of 6.1/10 could be much higher if consideration was given for certain interventions that could overlap for more than one clinical problem. For instance, if a clinician had recommended using ACE inhibitor for hypertension, and had not recommended it for the clinical problem of microalbuminuria, the clinician still lost 2 points on microalbuminuria management. Though in strict terms, as long as the intervention appears on the final treatment list of the patient no matter what it was recommended for, we adhered to the criterion as this program was being tested more as an educational tool rather than an implementation audit.

All the clinicians participating in the study had shown an improvement on the Trial awareness score (0.8 vs. 5.4, $P<0.05$), proving this program to be a good educational tool. Though naming of a clinical trial in itself may not be a good marker of a clinician's knowledge, this program at the least familiarizes the clinician to the evidence base, and hence could prompt them to narrow the knowledge gaps.

The global management score was calculated as a multiple of the above 3 scores. This helped to analyse the areas of weakness a clinician may have with a particular clinical problem. This score improved quite significantly by 65 % after using i-DREAM (31.8 vs. 52.4, $p<0.01$), the bulk of the improvement coming from trial awareness followed by the management recommendation component. This score correlates with the clinicians ability to identify a problem, to correlate the clinical situation to a matching research trial, and to recommend the evidence-based intervention. 32 of the clinicians more than doubled their scores after demonstration of i-DREAM reiterating the ability of this program to help the clinician have an approach to the patient that is multi-interventional.

Conclusion

i-DREAM is a simple public-domain tool that can be applied in clinical practice to use the best evidence from clinical trials for each individual patient, according to their clinical characteristics. The increased accessibility and user friendliness of this tool would be a major step forward in keeping abreast with the research evidence, and would encourage the learner to be a potential user of the available wealth of evidence.

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Appendix 1: Hypothetical case notes used in i-DREAM Study

Your grade : Student / Pharmacist / PRHO / SHO / Registrar / Consultant

67 years old Mr John Long came to the diabetes clinic for his annual review. He had no specific complaints though he was concerned about the recent episodes of angina he has been having. He had been smoking about 20 cigarettes a day all his life. He does not monitor his blood glucose regularly at home though he discloses that whenever he tested them, they were more than 10.

Appointment Type: Annual Review Diagnoses
- Type 2 diabetes 1992
- Recent admission for angina
- ECHO proven LVH

Advice	**Wt:** 71kg		**BMI:** 34.5		**Diet:**	**Smoking:** Y	**Cessation advice:**	**Exercise:** little		**Flu Vacc** Y		
BP	**BP 1:** 160/92				**BP 2:** 158/90			**BP** ↑				
Cholesterol	TC 6.1	LDL 3.6	HDL 0.8		TG 2.6	Creatinine 97	Cr Cl	U Prot. NAD	Microalb Y	UA CR		
Diabetes	**HbA1c:** 7.8%				**Hypos:** No			**Home Glucose:** Occasional				
Eyes	R	**VA:** 6/6	**DR:** Background			L	**VA:** 6/6	**DR:** None				
Feet	R	PT Y	DP Y	PN N	Ulc N	L	PT Y	DP Y	PN N	Ulc N		
Guardians	**Aspirin** N		**ACEI:** N			**AIIA:** N		**Lipid↓Rx:** N				

Current medications
Gliclazide 80 mg bd, GTN spray prn

Please identify the problem in management of above case, the management plan and the Evidence base to support the plan of action.

Problem	Solution	Evidence base

Appendix 2: AT A GLANCE abstract format of CARDS study

Acronym	**CARDS** : **C**ollaborative **A**torvastatin **D**iabetes **S**tudy
Title & Reference	Primary prevention of cardiovascular disease with Atorvastatin in Type 2 Diabetes in Collaborative Atorvastatin Diabetes Study (CARDS): Multicentre randomised placebo-controlled trial. Lancet 2004;**364**:685-96
Aim & Intro	• Type 2 Diabetes associated with 2-4fold increased risk of coronary heart disease and stroke • To assess the effectiveness of Atorvastatin 10mg od vs placebo in primary prevention of major CVD events in T2DM without high LDL cholesterol. • 1.57 fold increased risk of CHD for every 1mmol/L increase in LDL • HPS study showed a 25% reduction in major vascular events in diabetes by lipid lowering
Group	• n= 2838 Type 2 diabetes patients : Age: 40-75 yrs : 132 centres in UK and Ireland *Inclusion criteria*: • Diabetes for at least 6 months : LDL ≤ 4.14 mmol/L: TGL ≤ 6.78mmol/L • At least one of the following: Retinopathy, HT, Microalbuminuria, Smoking *Exclusion criteria*: • Creatinine >150µmol/L • HbA1c>12% • Previous documented MI, Angina, Coronary surgeries, Stroke or PVD • Less than 80% compliance with placebo
Limb & Endpoints	• Atorvastatin 10mg (n=1428) vs Placebo (n=1410) • Median follow up 3.9yrs; terminated earlier because efficacy was met *Primary endpoint*: • Time for occurrence of first acute coronary heart event, coronary revascularisation or stroke Secondary endpoint: • Death from any cause or • Any acute cardiovascular disease event

Absolute risk **N**NT

	Atorvastatin Vs. placebo	ARR	RRR	N N T / 3.9y	NNT / yr
All primary endpoint	9.0%→5.8%	3.2%	37% ***	31	122
Acute coronary events	5.5%→3.6%	1.9%	36%*	53	206
Coronary revascularisation	2.4%→1.7%	0.7%	31%NS	143	558
Stroke	2.8%→1.5%	1.3%	48%*	77	300
Death any cause	5.8%→4.3%	1.5%	26%NS	67	260
Any acute cardiovascular event	13.4%→9.4%	4%	30%***	25	98

Clinical conclusion	• Atorvastatin 10mg daily is safe and efficacious in reducing the risk of first cardiovascular event, including stroke, in patients with type 2 diabetes without high cholesterol • 37% reduction in major cardiovascular events and 48% reduction in stroke • 27 patients need to be treated for 4 yrs to prevent a major CVD event • Prevents 37 major event per 1000 people treated for 4 yrs • 50 fewer first or subsequent major CVD events out of 1000 patients treated for 4 years • No increased frequency of side effects compared to placebo: No rhabdomyolysis noted • No justification is available for having a particular threshold level of LDL as a sole arbiter of which patients should receive statin because no Diabetes patient is at a low risk of CV events
Education for patients	• Cholesterol is one of the most important risk factors for heart attacks. • Patients with Diabetes are likely to have heart attacks and stroke • Taking a cholesterol-lowering tablet called Atorvastatin 10mg regularly even if the cholesterol levels are normal would significantly decrease the chances of having a heart attack or stroke.

ARR- Absolute risk reduction RRR-Relative risk reduction NNT – Numbers needed to treat * $p<0.05$ ** $p<0.01$ *** $p<0.001$

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