A simple method to improve the audit process

- prospective, automated data collection and analysis using Microsoft Word and Excel

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Purpose

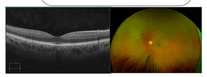
1.To describe a hybrid paper-electronic data collection system we have implemented in our virtual diabetic retinopathy clinic; this system enables automated, prospective data collection and analysis using simple tools in Microsoft Word and Excel. This method can be used for any audit and is particularly useful in departments without an electronic patient record (EPR).
2.To outline the steps needed in Word and Excel to implement such a system

Previous system

Virtual diabetic retinopathy data capture clinic (NB: Paper notes are still used in our Health Board)

Patient attends Virtual clinic → Nurse completes clinic proforma → Proforma filed in clinical notes → Images taken





Virtual diabetic retinopathy data review clinic

Images reviewed by clinician → Previously, paper proforma completed (by hand) and filed in notes → For audit of new service, data entered **manually** into Excel spreadsheet for later analysis

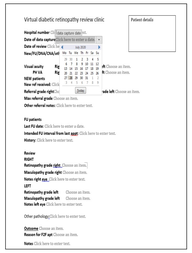
PROBLEM
- Time-consuming
- Inefficient use of resources

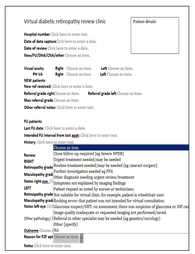
SOLUTION!

We converted the Virtual review clinic proforma to a Word document with **"Content Control"** fields

•Content controls are editable portions of a Word document that can be configured such that they can only contain specific content e.g. dates, numbers, set values from a drop-down list.
•There are 2 distinct benefits from using Content Controls

1. Ensuring consistency of data inputs
2. Data from Content Control fields can be extracted by other programmes such as MS Excel/Access



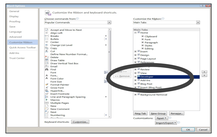


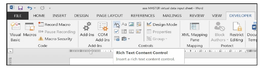
Examples of Content Control drop-down lists and date picker

A (Fairly) Brief Guide:

Step 1 – setting up Content Controls in Word

1.File > Options > Customise ribbon > Select "Developer" tab
2.Design clinic/data collection proforma
(Headings eg "Hospital number" or "VA" are written as text in the usual way)
3.To input data you wish to collect later, you must use Content Controls



4.Once the form is designed and completed, it is saved as a Master copy

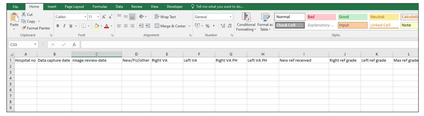
Step 2 - New process in Virtual diabetic retinopathy data review clinic

Images reviewed by clinician → Word document completed for each patient. Printed, sticky labels affixed and filed in notes → Word document saved in designated "Data" folder
NB it is from this "Data" folder that Excel will extract relevant data

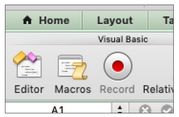
Step 3 - Excel

A few points about Excel...
•Excel is a diverse and powerful program with a vast array of functions
•As non-experts, we will be unfamiliar with the majority of these functions
•Once you know **WHAT** Excel can do (e.g. extract data from Word documents) there are many simple, step-by-step resources online to tell you **HOW** to do it
•All of the following steps have been completed with no knowledge or experience of computer coding

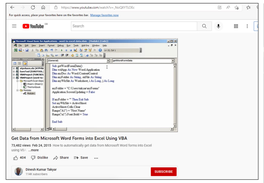
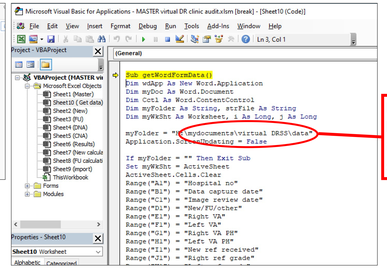
1.Design the spreadsheet with column headings corresponding to the Content Controls in the word document



2.Make sure "Developer" tab is selected in same way as for Word
3.Select "Macro", name the Macro (eg "getWordFormData") and click "Create"
- You will now have a box into which the Macro code can be inputted.



4.The code we used was obtained from a YouTube tutorial on how to extract data from Word to Excel

```
Sub getWordFormData()
Dim wdApp As New Word.Application
Dim myDoc As Word.Document
Dim Cctl As Word.ContentControl
Dim myFolder As String, strFile As String
Dim myWkSht As Worksheet, i As Long, j As Long

myFolder = "C:\Users\mydocuments\virtual DR$$\data"
Application.ScreenUpdating = False

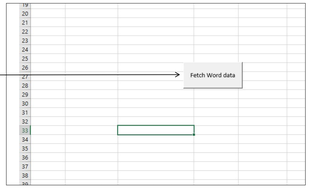
If myFolder = "" Then Exit Sub
Set myWkSht = ActiveSheet
ActiveSheet.Cells.Clear
Range("A1") = "Hospital no"
Range("B1") = "Data capture date"
Range("C1") = "Image review date"
Range("D1") = "New/FU/other"
Range("E1") = "Right VA"
Range("F1") = "Left VA"
Range("G1") = "Right VA PH"
Range("H1") = "Left VA PH"
Range("I1") = "New ref received"
Range("J1") = "Right ref grade"
```

In this line, input the location of "Data" folder that Excel needs to extract data from

- When the code is run, Excel looks in the "Data" folder for any Word documents
- It looks through each file and extracts the data from each Content Control field in the order they appear in the Word document
- It copies these data into the appropriate Excel columns

NB: Understanding exactly what each bit of this code means is not essential to the successful operation of the code!

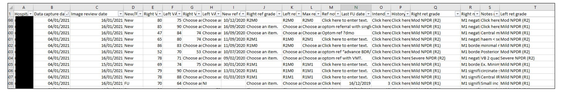
5. Once the Macro code has been copied and saved, a "Macro" button is created.



Clicking on this button executes the code and begins the data extraction process. This can be done at the end of each clinic or at the end of the audit data collection period.

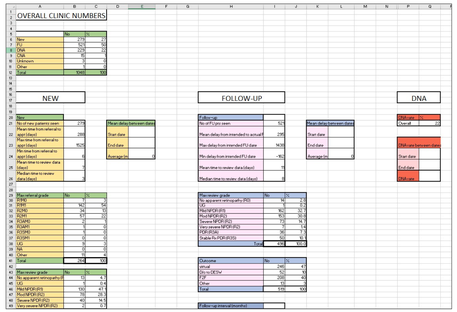
Step 4 – Data analysis

1. All the extracted data from the virtual clinic Word documents are now contained in the "MASTER" worksheet.



1. Calculations to analyse data can be written in Excel once data collection is complete (e.g. calculate mean delay in follow-up, proportion of New vs FU patients, DNA rate etc).
3. To further save time, we completed a "Results" worksheet with all the necessary calculations for the Virtual DR clinic written in advance of data collection.

4.These calculations are updated instantly once the "Master" worksheet is updated. This allows results for rolling or repeated audits to be produced instantly



Conclusions

1. **As newer services such as virtual clinics are implemented, on-going data collection and evaluation is required for quality assurance purposes and to inform resource management decisions.**
2. **The process of audit and service evaluation can be laborious and time-consuming**
3. **This system was produced with zero coding knowledge, is easy to replicate and will be useful particularly in units without an EPR.**
4. **Data fields and results calculations are customisable - the method can be used for large service evaluations or for smaller projects where EPR audit tools are not available.**
5. **This method has allowed us to prospectively collect data on all patients attending the virtual diabetic retinopathy clinic and collate and analyse it in a process that takes minutes.**

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