



# DATA MODELLING & DATABASE CREATION EXERCISE

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# 1 Introduction

In this document a relational database will be created for Sysmed Hospital and documentation explaining what steps have been taken and why will be provided. The normalization process and relational database are based in the following requirements given by the teacher in the assignment files:

- A referral is for one patient only, but a patient can be referred multiple times, even to the same surgeon. Referrals made for a patient to the same surgeon cannot happen on the same date (referral date);
- It is vital that Sysmed Hospital knows which person (“Referrer”) made a particular referral;
- A surgeon is associated with one department only;
- A referrer is associated with one organization only;
- The person called John English at Sydenham GPs is *not* the same person as the John English at St Albans Health Clinic.

## 2 Tables of data normalisation process

### 2.1 First Normal Form (1NF)

To normalise the table to 1NF, each table cell needs to have only one value. For this reason, the following columns (attributes) were created:

- patient\_surname;
- patient\_contact\_2;
- referrer\_surname;
- surgeon\_surname.

The table with the new attributes is presented in Table 1 below. In this and in all the next tables:

- attributes created are represented by the colour **red**;
- **yellow** represents the primary keys;
- **green** represents the foreign keys;
- and **blue** represents the primary keys and foreign keys.

Sysmed Hospital								
patient_id	nhi	patient_name	patient_surname	date_of_birth	patient_contact_1	patient_contact_2	referrer_name	referrer_surname
36	HGM6173	Emalia	Killen	21/10/1989	029 6057 236	03 3245524	Hilary	Trump
35	QNE4372	Elvera	Peasby	21/10/2005	021 9642 583		Temuera	Smith
95	TBC7855	Vina	Dimond	04/06/1967	029 1885 413		John	English
81	SXL9274	Samson	Durbann	11/04/1967	026 6521 234		John	Richards
25	YSN6005	Clovis	Espadate	07/01/1987	022 6849 024	03 3928741	Amit	Oliver
50	GMC9989	Hank	Solan	13/09/2006	020 4503 731		Michael	Scott
63	MSC5721	Marni	Kalisz	09/02/1963	021 7165 524	03 2752383	Linda	Moore
6	GOZ3094	Andre	Wallen	01/06/1987	029 6334 916		Hilary	Trump
5	ODR2838	Andra	Francescuocio	04/04/1951	027 0970 403	03 5543681	Amit	Oliver
67	CYC0720	Nahum	Drewet	05/10/1962	028 9711 683		Temuera	Smith
66	SMH8891	Myrilla	Jeandon	08/02/1968	022 0127 428		Temuera	Smith
29	GKY3212	Davida	MacCurlye	30/09/1965	021 2746 056		Hilary	Trump
1	ETV6899	Abba	Rusk	17/08/1961	029 0581 011	03 4864751	Temuera	Smith
3	ZYF6173	Almeria	Crasford	11/01/1982	028 3532 070		Lesley	Young
6	GOZ3094	Andre	Wallen	01/06/1987	029 6334 916		Donald	Clinton
47	YBS8538	Gordy	Bellay	24/07/1970	028 1631 456		Temuera	Smith
41	BVF7686	Flin	Gleasane	26/09/2008	026 4496 384		Amit	Oliver
19	CY28554	Casper	Ashworth	10/12/1966	028 5830 445		Linda	Moore
47	YBS8538	Gordy	Bellay	24/07/1970	028 1631 456		Temuera	Smith
33	LFV3925	Efrem	Kippax	05/05/1973	029 8554 441	03 7600421	Temuera	Smith
88	SYK7786	Silas	Liggins	19/11/1961	028 6005 335		Linda	Moore
8	WHL2345	Ardelia	Parmiter	15/05/1970	022 3495 970	03 3809486	John	English
37	ODR6693	Emyle	Sokale	24/08/1979	027 7067 672		Linda	Moore
25	YSN6005	Clovis	Espadate	07/01/1987	022 6849 024	03 3928741	Bill	Key
99	FQI2958	Wilone	Tofanelli	24/05/2006	026 9154 770		Michael	Scott
14	QJC2233	Blinnie	Olivari	05/10/1969	022 3493 070		Bill	Key
30	GKY3212	Delila	Ladbrooke	19/08/2006	029 7048 927		Donald	Clinton
7	CL21078	Arabelle	Bourbon	28/06/1969	029 0723 663		Michael	Scott
85	PZD7227	Shellysheldon	Diggs	08/10/1975	0218911965		John	Richards
2	IXF4149	Adena	Elliott	17/08/1952	0215892 554		John	English

organization_name	organization_contact	surgeon_name	surgeon_surname	sysmed_department	referral_date	urgency
Sumner Medical Centre	03 388 7766	Philip	Mitchell	Plastics	13/07/2015	Medium
Merivale GPs	03 311 0008	Nabaz	Sayeed	Paediatric Surgery	01/09/2015	Low
St Albans Health Clinic	03 378 1111	Lindsay	Nelson	Orthopaedics	02/10/2015	Low
Ara Health Centre	03 367 0978	Andy	La Salle	Cardiothoracic	05/10/2015	Low
Redcliffs Medical Centre	03 345 6789	Greta	McLean	Plastics	14/10/2015	Medium
St Albans Health Clinic	03 378 1111	Nabaz	Sayeed	Paediatric Surgery	24/10/2015	Low
Ara Health Centre	03 367 0978	Karen	Reid	General Surgery	17/11/2015	Low
Sumner Medical Centre	03 388 7766	John	Martin	General Surgery	02/12/2015	Medium
Redcliffs Medical Centre	03 345 6789	Peri	Duffy	Cardiothoracic	04/01/2016	Medium
Merivale GPs	03 311 0008	Andy	La Salle	Cardiothoracic	01/02/2016	High
Merivale GPs	03 311 0008	Peri	Duffy	Cardiothoracic	05/02/2016	Low
Sumner Medical Centre	03 388 7766	Greta	McLean	Plastics	26/02/2016	High
Merivale GPs	03 311 0008	John	Martin	General Surgery	05/03/2016	High
Ara Health Centre	03 367 0978	Steve	Renison	Cardiothoracic	20/03/2016	Medium
Sumner Medical Centre	03 388 7766	Evelyn	Rae	Orthopaedics	26/03/2016	High
Merivale GPs	03 311 0008	John	Martin	General Surgery	28/03/2016	Low
Redcliffs Medical Centre	03 345 6789	Andrew	Hood	Paediatric Surgery	04/04/2016	Medium
Ara Health Centre	03 367 0978	Simon	Frampton	General Surgery	18/04/2016	Low
Merivale GPs	03 311 0008	Richard	Cain	Plastics	18/04/2016	Medium
Merivale GPs	03 311 0008	Steve	Renison	Cardiothoracic	26/04/2016	High
Ara Health Centre	03 367 0978	Robert	Patrick	Orthopaedics	23/05/2016	Low
St Albans Health Clinic	03 378 1111	Evelyn	Rae	Orthopaedics	04/06/2016	High
Ara Health Centre	03 367 0978	Greta	McLean	Plastics	16/06/2016	High
Redcliffs Medical Centre	03 345 6789	Robert	Patrick	Orthopaedics	19/06/2016	Low
St Albans Health Clinic	03 378 1111	Nabaz	Sayeed	Paediatric Surgery	22/06/2016	Low
Redcliffs Medical Centre	03 345 6789	Andy	La Salle	Cardiothoracic	07/07/2016	Low
Sumner Medical Centre	03 388 7766	Michael	Lewis	Paediatric Surgery	21/07/2016	High
St Albans Health Clinic	03 378 1111	Simon	Frampton	General Surgery	23/07/2016	Low
Ara Health Centre	03 367 0978	Peri	Duffy	Cardiothoracic	27/07/2016	Low
Sydenham GPs	03 366 4653	Karen	Reid	General Surgery	09/08/2016	Medium

**Table 1 - Table in First Normal Form (1NF)**

## 2.2 Second Normal Form (2NF)

The 1NF done and the fully functional dependency of all non-key attributes to the primary key are the conditions required to normalise the table to 2NF. To normalise to 2NF the data was divided into 4 tables, and in each table the primary key was identified or created conforming Table 2, Table 3, Table 4 and Table 5 below. Duplicate data in the Patient Table, Referring Organization Table and Surgeon Table was deleted.

patient_id	patient_name	patient_surname	nhi	date_of_birth	patient_contact_1	patient_contact_2
1	Abba	Rusk	ETV6899	17/08/1961	029 0581 011	03 4864751
2	Adena	Elliott	IXF4149	17/08/1952	021 5892 554	
3	Almeria	Crasford	ZYF6173	11/01/1982	028 3532 070	
5	Andra	Francescuccio	ODR2838	04/04/1951	027 0970 403	03 5543681
6	Andre	Wallen	GOZ3094	01/06/1987	029 6334 916	
7	Arabelle	Bourbon	CLZ1078	28/06/1969	029 0723 663	
8	Ardelia	Parmiter	WHL2345	15/05/1970	022 9495 970	03 3809486
14	Blinnie	Olivari	OJC2233	05/10/1969	022 9499 070	
19	Casper	Ashworth	CYZ8554	10/12/1966	028 5830 445	
25	Clovis	Espadate	YSN6005	07/01/1987	022 6849 024	03 3928741
29	Davida	MacCurlye	GKY3212	30/09/1965	021 2746 056	
30	Delila	Ladbroke	GKY3212	19/08/2006	029 7048 927	
33	Efrem	Kippax	LFV3925	05/05/1973	029 8554 441	03 7600421
35	Elvera	Peasby	QNE4372	21/10/2005	021 9642 583	
36	Emalia	Killen	HGM6173	21/10/1989	029 6057 296	03 3245524
37	Emyle	Sokale	OBR6693	24/08/1979	027 7067 672	
41	Flin	Gleasane	BVF7686	26/09/2008	026 4496 384	
47	Gordy	Bellay	YBS8538	24/07/1970	028 1631 456	
50	Hank	Solan	GMC9989	13/09/2006	020 4503 791	
63	Marni	Kalisz	MSC5721	09/02/1963	021 7165 524	03 2752383
66	Myrilla	Jeandon	SMH8891	08/02/1968	022 0127 428	
67	Nahum	Drewet	CYC0720	05/10/1962	028 9711 683	
81	Samson	Durbann	SXL9274	11/04/1967	026 6521 234	
85	Shellysheldon	Digges	PZD7227	08/10/1975	021 8911 965	
88	Silas	Lipgens	SYK7786	19/11/1961	028 6005 335	
95	Vina	Dimond	TBC7855	04/06/1967	029 1885 413	
99	Wilone	Tofanelli	FQI2958	24/05/2006	026 9154 770	

**Table 2 - Patient Table in 2NF**

**Referring Organization Table**

referrer_id	referrer_name	referrer_surname	organization_name	organization_contact
1	Amit	Oliver	Redcliffs Medical Centre	03 345 6789
2	Bill	Key	Redcliffs Medical Centre	03 345 6789
3	Donald	Clinton	Sumner Medical Centre	03 388 7766
4	Hilary	Trump	Sumner Medical Centre	03 388 7766
5	John	English	Sydenham GPs	03 366 4653
6	John	English	St Albans Health Clinic	03 378 1111
7	John	Richards	Ara Health Centre	03 367 0978
8	Lesley	Young	Ara Health Centre	03 367 0978
9	Linda	Moore	Ara Health Centre	03 367 0978
10	Michael	Scott	St Albans Health Clinic	03 378 1111
11	Temuera	Smith	Merivale GPs	03 311 0008

**Table 3 – Referring Organization Table in 2NF**

**Surgeon Table**

surgeon_id	surgeon_name	surgeon_surname	sysmed_department
1	Richard	Cain	Plastics
2	Peri	Duffy	Cardiothoracic
3	Simon	Frampton	General Surgery
4	Andrew	Hood	Paediatric Surgery
5	Andy	La Salle	Cardiothoracic
6	Michael	Lewis	Paediatric Surgery
7	John	Martin	General Surgery
8	Greta	McLean	Plastics
9	Philip	Mitchell	Plastics
10	Lindsay	Nelson	Orthopaedics
11	Robert	Patrick	Orthopaedics
12	Evelyn	Rae	Orthopaedics
13	Karen	Reid	General Surgery
14	Steve	Renison	Cardiothoracic
15	Nabaz	Sayeed	Paediatric Surgery

**Table 4 – Surgeon Table in 2NF**

**Referral Tracking Table**

referral_date	surgeon_id	referrer_id	patient_id	urgency
05/03/2016	7	11	1	High
09/08/2016	13	5	2	Medium
20/03/2016	14	8	3	Medium
04/01/2016	2	1	5	Medium
02/12/2015	7	4	6	Medium
26/03/2016	12	3	6	High
23/07/2016	3	10	7	Low
04/06/2016	12	6	8	High
07/07/2016	5	2	14	Low
18/04/2016	3	9	19	Low
14/10/2015	8	1	25	Medium
19/06/2016	11	2	25	Low
26/02/2016	8	4	29	High
21/07/2016	6	3	30	High
26/04/2016	14	11	33	High
01/09/2015	15	11	35	Low
13/07/2015	9	4	36	Medium
16/06/2016	8	9	37	High
04/04/2016	4	1	41	Medium
18/04/2016	1	11	47	Medium
28/03/2016	7	11	47	Low
24/10/2015	15	10	50	Low
17/11/2015	13	9	63	Low
05/02/2016	2	11	66	Low
01/02/2016	5	11	67	High
05/10/2015	5	7	81	Low
27/07/2016	2	7	85	Low
23/05/2016	11	9	88	Low
02/10/2015	10	6	95	Low
22/06/2016	15	10	99	Low

**Table 5 – Referral Tracking Table in 2NF**

### 2.3 Third Normal Form (3NF)

To normalise the table into 3NF the 2NF needs to be done and it is required to remove any transitive dependency, so Referring Organization Table was divided into 2 tables: Referrer Table and Referring Organization Table, as represented by Table 6 and Table 7 below. Duplicate data in the Referrer Table and Referring Organization Table was deleted.

**Referrer Table**

referrer_id	referrer_name	referrer_surname	organization_name
1	Amit	Oliver	Redcliffs Medical Centre
2	Bill	Key	Redcliffs Medical Centre
3	Donald	Clinton	Sumner Medical Centre
4	Hilary	Trump	Sumner Medical Centre
5	John	English	Sydenham GPs
6	John	English	St Albans Health Clinic
7	John	Richards	Ara Health Centre
8	Lesley	Young	Ara Health Centre
9	Linda	Moore	Ara Health Centre
10	Michael	Scott	St Albans Health Clinic
11	Temuera	Smith	Merivale GPs

**Table 6 – Referrer Table in 3NF****Referring Organization Table**

organization_name	organization_contact
Ara Health Centre	03 367 0978
Merivale GPs	03 311 0008
Redcliffs Medical Centre	03 345 6789
St Albans Health Clinic	03 378 1111
Sumner Medical Centre	03 388 7766
Sydenham GPs	03 366 4653

**Table 7 – Referring Organization Table in 3NF**

Please see excel document attached to this assignment called: “Normalised tables” to access the normalisation process.

### 3 Identification/creation of primary keys

The primary key of **Patient Table** is patient\_id, although NHI is a unique number it cannot be used as primary key because it is a personal identity number.

The primary key of **Referrer Table** is referrer\_id because even so a referrer is associated with one organisation only, in the same organization two persons could have the same name so the Referrer\_id is the only unique field. Also, the referrer\_id will not change, if a referrer changes of organization, which could happen in case someone change the job, then a new referrer\_id will be created and the old referrer\_id could be used to keep in the historical data.

The primary key of **Referring Organization Table** is organization\_name. We are assuming that the organization\_name is unique, like a brand, it cannot be copied.



The primary key of **Surgeon Table** is surgeon\_id because it is a unique field. Two surgeons could have the same name and work for the same department, the only attribute that can be unique is the surgeon\_id.

The primary key of **Referral Tracking Table** is a composite primary key formed by referral\_date, surgeon\_id and patient\_id. There is no need to create a new column for a unique Referral id field because, as the assignment file says: "Referrals made for a patient to the same surgeon cannot happen on the same date (referral date)", so the date of the referral, the patient\_id and the surgeon\_id become a unique identifier. The foreign keys are: surgeon\_id, referrer\_id and patient\_id.

Below are the tables, attributes, primary keys (PK), and foreign keys (FK):

Patient Table	
PK	patient_id
	patient_name
	patient_surname
	nhi
	date_of_birth
	patient_contact_1
	patient_contact_2

Referrer Table	
PK	referrer_id
	referrer_name
	referrer_surname
FK	organization_name

Referring Organization Table	
PK	organization_name
	organization_contact

Surgeon Table	
PK	surgeon_id
	surgeon_name
	surgeon_surname
	sysmed_department

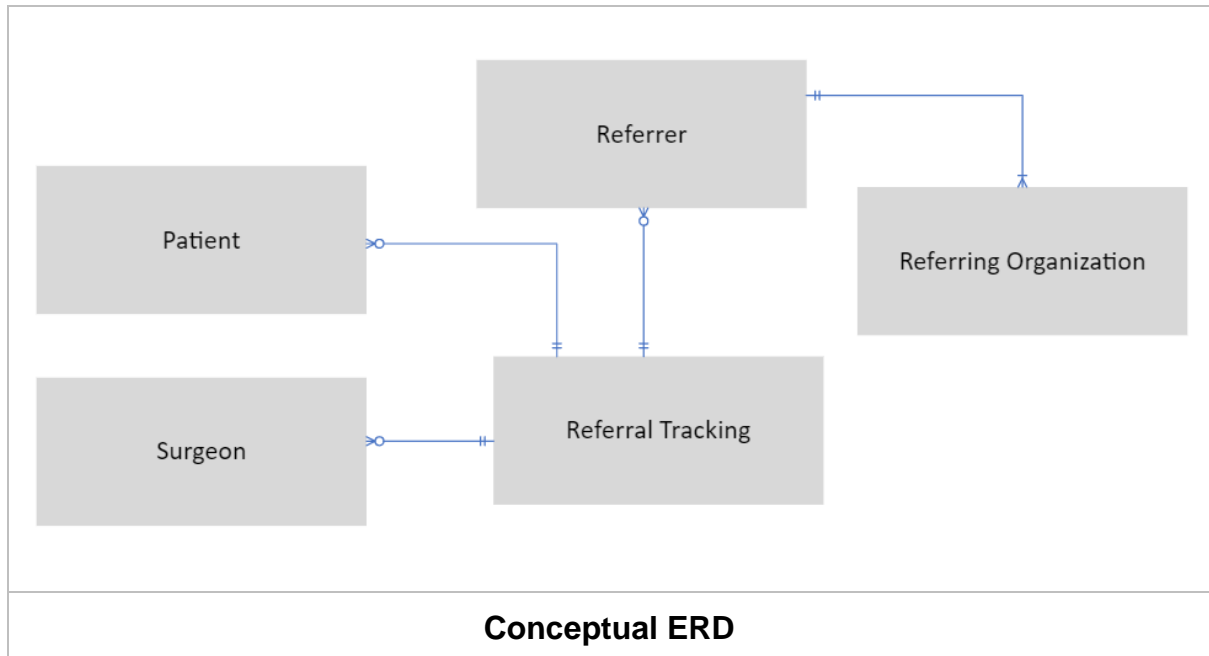
Referral Tracking Table	
PK	referral_date
PK FK	surgeon_id
FK	referrer_id
PK FK	patient_id
	urgency

#### 4 Creation of a conceptual ERD

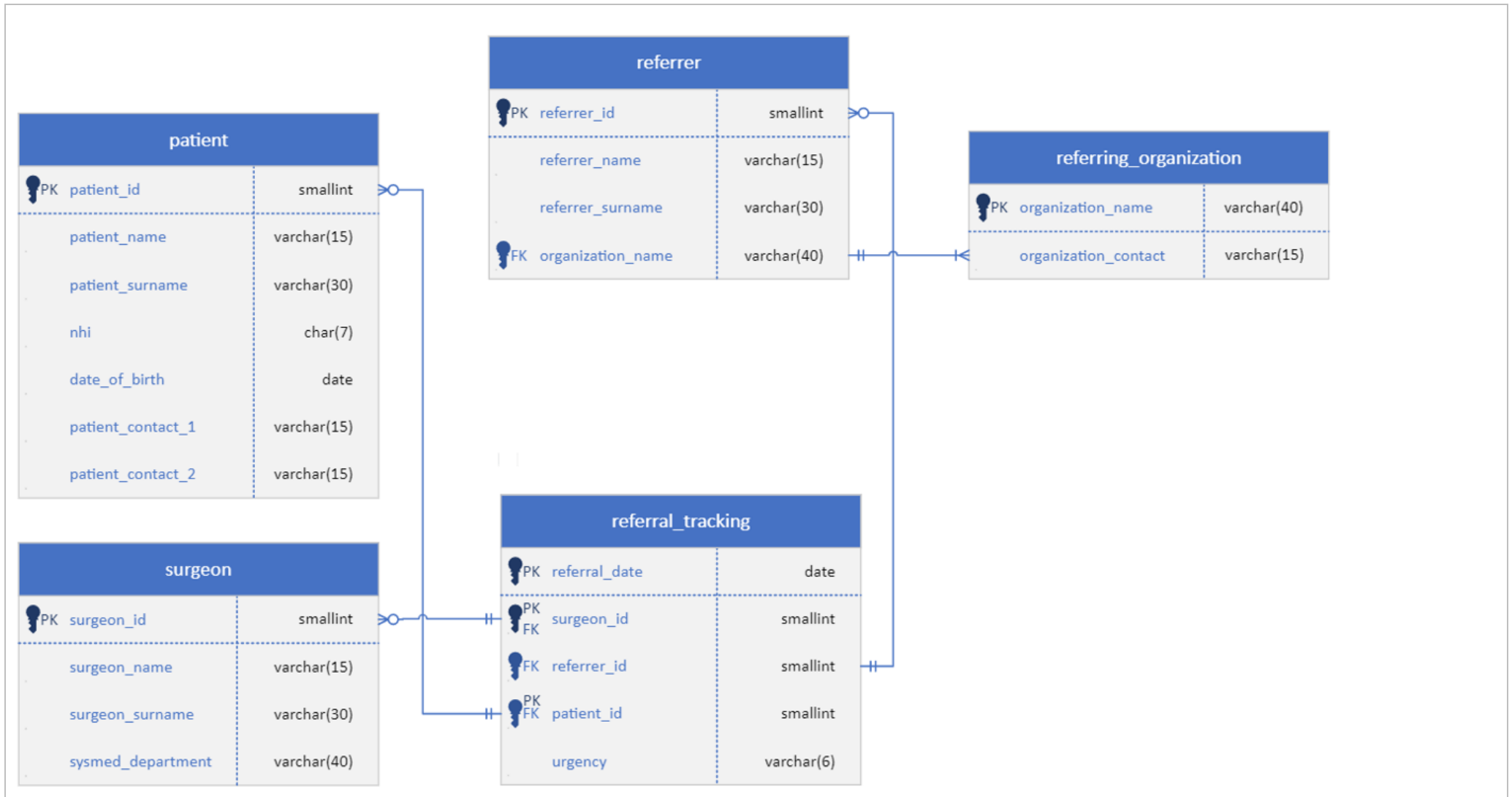
As figure below, in the conceptual ERD created, zero or more patients can have referrals, because a patient may not need to be referred to a surgeon, but a referral is made for one patient only.

A surgeon can be referred zero or more times, but each referral is made for only one surgeon.

Each referral will also have only one referrer, and a referrer can make zero or more referrals. It could be for example a new doctor that have not done any referrals yet. A referrer is associated with one referring organisation only, but a referring organization could have one or more referrers.



## 5 Creation of a logical ERD



## **6 Database creation**

The database was created according to the logical ERD and the statements are attached to this assignment in a document called *DatabaseCreation.sql*

The only NULL attribute allowed was patient\_contact\_2 because it is an extra information. All the other attributes need to be NOT NULL because they are essential information. The NHI has the datatype char(7) because NHI numbers have 7 characters and the char data type is a fixed number so it will prevent users to insert wrong data. Patient and organization contact have data type varchar(15) because if an international number is inserted it will have maximum 15 characters. Smallint is a data type used in "id" fields because it goes until 32,767 which should be more than enough for Sysmed Hospital.

## **7 Bulk load the data into the database**

The CSV files containing the data that was used to bulk into the database are attached to this assignment in a folder called Bulk Loading Data Files and the SQL statements for bulk loading are in a file called *DataLoading.sql*. Follow below the screenshots of the tables created after the data was loaded.

77

78

SELECT \* FROM patient

161 %

Results Messages

	patient_id	patient_name	patient_surname	nhi	date_of_birth	patient_contact_1	patient_contact_2
1	1	Abba	Rusk	ETV6899	1961-08-17	029 0581 011	03 4864751
2	2	Adena	Elliott	IXF4149	1952-08-17	021 5892 554	NULL
3	3	Almeria	Crasford	ZYF6173	1982-01-11	028 3532 070	NULL
4	5	Andra	Francescuccio	ODR2838	1951-04-04	027 0970 403	03 5543681
5	6	Andre	Wallen	GOZ3094	1987-06-01	029 6334 916	NULL
6	7	Arabelle	Bourbon	CLZ1078	1969-06-28	029 0723 663	NULL
7	8	Ardelia	Pamiter	WHL2345	1970-05-15	022 9495 970	03 3809486
8	14	Blinnie	Olivari	OJC2233	1969-10-05	022 9499 070	NULL
9	19	Casper	Ashworth	CYZ8554	1966-12-10	028 5830 445	NULL
10	25	Clovis	Espadate	YSN6005	1987-01-07	022 6849 024	03 3928741
11	29	Davida	MacCurlye	GKY3212	1965-09-30	021 2746 056	NULL
12	30	Delila	Ladbrooke	GKY3212	2006-08-19	029 7048 927	NULL
13	33	Efrem	Kippax	LFV3925	1973-05-05	029 8554 441	03 7600421
14	35	Elvera	Peasby	QNE4372	2005-10-21	021 9642 583	NULL
15	36	Emalia	Killen	HGM6173	1989-10-21	029 6057 296	03 3245524
16	37	Emyle	Sokale	OBR6693	1979-08-24	027 7067 672	NULL
17	41	Flin	Gleasane	BVF7686	2008-09-26	026 4496 384	NULL
18	47	Gordy	Bellay	YBS8538	1970-07-24	028 1631 456	NULL
19	50	Hank	Solan	GMC9989	2006-09-13	020 4503 791	NULL
20	63	Mami	Kalisz	MSC5721	1963-02-09	021 7165 524	03 2752383
21	66	Myrilla	Jeandon	SMH8891	1968-02-08	022 0127 428	NULL
22	67	Nahum	Drewet	CYC0720	1962-10-05	028 9711 683	NULL
23	81	Samson	Durbann	SXL9274	1967-04-11	026 6521 234	NULL
24	85	Shellysheldon	Digges	PZD7227	1975-10-08	021 8911 965	NULL
25	88	Silas	Lipgens	SYK7786	1961-11-19	028 6005 335	NULL
26	95	Vina	Dimond	TBC7855	1967-06-04	029 1885 413	NULL
27	99	Wilone	Tofanelli	FQI2958	2006-05-24	026 9154 770	NULL

Screenshot patient table

78

SELECT \* FROM patient

79

SELECT \* FROM surgeon

80

SELECT \* FROM referring\_organization

81

SELECT \* FROM referrer

161 %

Results

Messages

	surgeon_id	surgeon_name	surgeon_surname	sysmed_department
1	1	Richard	Cain	Plastics
2	2	Peri	Duffy	Cardiothoracic
3	3	Simon	Frampton	General Surgery
4	4	Andrew	Hood	Paediatric Surgery
5	5	Andy	La Salle	Cardiothoracic
6	6	Michael	Lewis	Paediatric Surgery
7	7	John	Martin	General Surgery
8	8	Greta	McLean	Plastics
9	9	Philip	Mitchell	Plastics
10	10	Lindsay	Nelson	Orthopaedics
11	11	Robert	Patrick	Orthopaedics
12	12	Evelyn	Rae	Orthopaedics
13	13	Karen	Reid	General Surgery
14	14	Steve	Renison	Cardiothoracic
15	15	Nabaz	Sayeed	Paediatric Surgery

Screenshot surgeon table

80	SELECT * FROM referring_organization
81	SELECT * FROM referrer

161 %	Results	Messages
	organization_name	organization_contact
1	Ara Health Centre	03 367 0978
2	Merivale GPs	03 311 0008
3	Redcliffs Medical Centre	03 345 6789
4	St Albans Health Clinic	03 378 1111
5	Sumner Medical Centre	03 388 7766
6	Sydenham GPs	03 366 4653

Screenshot referring organization table

```

78 SELECT * FROM patient
79 SELECT * FROM surgeon
80 SELECT * FROM referring_organization
81 SELECT * FROM referrer
82 SELECT * FROM referral_tracking
83
84

```

161 %

Results Messages

	referrer_id	referrer_name	referrer_surname	organization_name
1	1	Amit	Oliver	Redcliffs Medical Centre
2	2	Bill	Key	Redcliffs Medical Centre
3	3	Donald	Clinton	Sumner Medical Centre
4	4	Hilary	Trump	Sumner Medical Centre
5	5	John	English	Sydenham GPs
6	6	John	English	St Albans Health Clinic
7	7	John	Richards	Ara Health Centre
8	8	Lesley	Young	Ara Health Centre
9	9	Linda	Moore	Ara Health Centre
10	10	Michael	Scott	St Albans Health Clinic
11	11	Temuera	Smith	Merivale GPs

**Screenshot referrer table**



```

78 SELECT * FROM patient
79 SELECT * FROM surgeon
80 SELECT * FROM referring_organization
81 SELECT * FROM referrer
82 SELECT * FROM referral_tracking
83

```

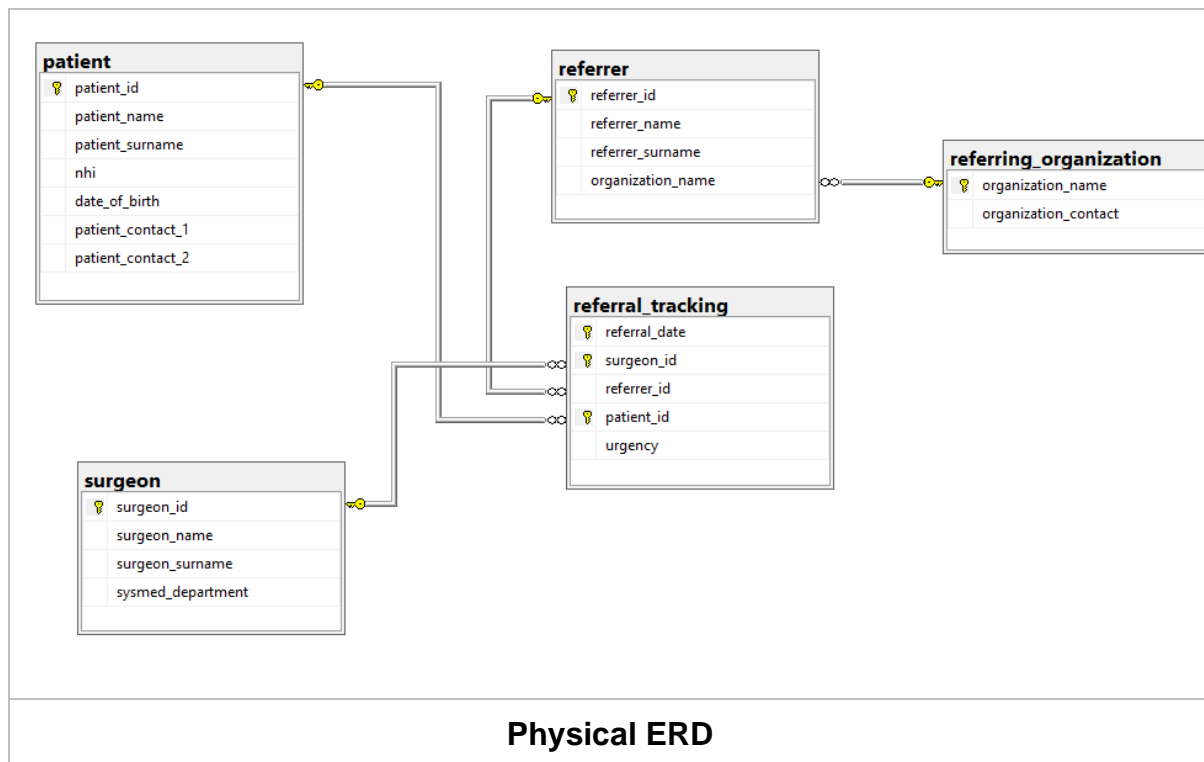
161 %

Results Messages

	referral_date	surgeon_id	referrer_id	patient_id	urgency
1	2015-07-13	9	4	36	Medium
2	2015-09-01	15	11	35	Low
3	2015-10-02	10	6	95	Low
4	2015-10-05	5	7	81	Low
5	2015-10-14	8	1	25	Medium
6	2015-10-24	15	10	50	Low
7	2015-11-17	13	9	63	Low
8	2015-12-02	7	4	6	Medium
9	2016-01-04	2	1	5	Medium
10	2016-02-01	5	11	67	High
11	2016-02-05	2	11	66	Low
12	2016-02-26	8	4	29	High
13	2016-03-05	7	11	1	High
14	2016-03-20	14	8	3	Medium
15	2016-03-26	12	3	6	High
16	2016-03-28	7	11	47	Low
17	2016-04-04	4	1	41	Medium
18	2016-04-18	1	11	47	Medium
19	2016-04-18	3	9	19	Low
20	2016-04-26	14	11	33	High
21	2016-05-23	11	9	88	Low
22	2016-06-04	12	6	8	High
23	2016-06-16	8	9	37	High
24	2016-06-19	11	2	25	Low
25	2016-06-22	15	10	99	Low
26	2016-07-07	5	2	14	Low
27	2016-07-21	6	3	30	High
28	2016-07-23	3	10	7	Low
29	2016-07-27	2	7	85	Low
30	2016-08-09	13	5	2	Medium

Screenshot referral tracking table

## 8 Create a physical ERD



## 9 Create a data dictionary

The data dictionary is in the excel file called “Data Dictionary” submitted with this assignment and in the figure below.

Sysmed Hospital Data Dictionary								
Table Name	Column Name	Data Type	Length	Identity	P Key	F Key	Table Name of Foreign Key	Description
patient	patient_id	smallint			PK			
	patient_name	varchar	15					
	patient_surname	varchar	30					
	nhi	char	7					
	date_of_birth	date						
	patient_contact_1	varchar	15					
referrer	patient_contact_2	varchar	15					
	referrer_id	smallint		Y	PK			
	referrer_name	varchar	15					
	referrer_surname	varchar	30					
referring organization	organization_name	varchar	40			FK	referring organization	
	organization_name	varchar	40		PK			
	organization_contact	varchar	15					
surgeon								
	surgeon_id	smallint		Y	PK			
	surgeon_name	varchar	15					
	surgeon_surname	varchar	30					
referral tracking	sysmed_department	varchar	40					
	referral_date	date			PK			dd-mm-yyyy of the referral
	surgeon_id	smallint			PK	FK	surgeon	
	referrer_id	smallint				FK	referrer	
	patient_id	smallint			PK	FK	patient	
	urgency	varchar	6					