GRHANITE™

(*solid as a rock*)

data linkage and information sharing

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Medicine, Dentistry & Health Sciences

THE UNIVERSITY OF MELBOURNE
Australia

GRHANITE™
GeneRic HeAlth Network Information Technology for the Enterprise

Objectives

- Describe the GRHANITE™ principles, methods and tools

  - *operational, ethics and governance processes, and standard operating protocols during the collection and linkage of individual identifiers.*

- Demonstrate the viability of large-scale pseudonymised data repositories with the capability to perform automated and generic data linkage and acquisition.

Guiding principles

- Individual consent varies in extent and nature and over time;
- Data linkage requires:
  - *accurate and reliable identification and authentication of individuals;*
  - *Capability to interface with many disparate technologies in a very generic manner;*
- Automated communications require external connections, usually through corporate firewalls;
- Security must be inherent in the collection, linkage, aggregation, storage and analysis system; and
- Re-identification is often required e.g. clinical follow-up of abnormal tests or clinical trials safety monitoring

UPP 1. Anonymity & Pseudonymity

- Wherever it is lawful and practicable in the circumstances, agencies and organisations must give individuals the clear option of interacting by either:

    1. *not identifying themselves; or*
    2. *identifying themselves with a pseudonym.*

- A pseudonym may be a name, term or combination of letters and numerals through which an individual can be addressed specifically

Medicine, Dentistry
& Health Sciences

Pseudonymity and privacy preserving data management

GRHANITE™ privacy preserving data management

Hospital

Hospital Computers

Consent & Security

Name: Joe Smith

DoB: 14/07/1993

HBA1c: 11.2

Joe Smith pseudonymised

cDOpy28aFAKyaqDdq5xo+OhmxGlOMGY
NTyJ1qf+TSHZhC974lkxaixZSdTNGp5ne8
UZPKF2mz0Xgw3QuSWaadwvKlYkKQ7b
mFOPnpjnSHkM=

If consent is valid, GRHANTE™ pseudonymises and transfers the personal information to the data warehouse

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GRHANITE™ Data warehouse of non-identifiable information

cDOpy28aFAKyaqDdq5xo+OhmxGlOMGY
NTyJ1qf+TSHZhC974lkxaixZSdTNGp5ne8
UZPKF2mz0Xgw3QuSWaadwvKlYkKQ7b
mFOPnpjnSHkM=

If consent is valid, the pseudonymised data is made accessible to authorised agents in the network

General Practice

Practice Computers

Consent & Security

Name: Joe Smith

DoB: 14/07/1993

HBA1c: 11.2

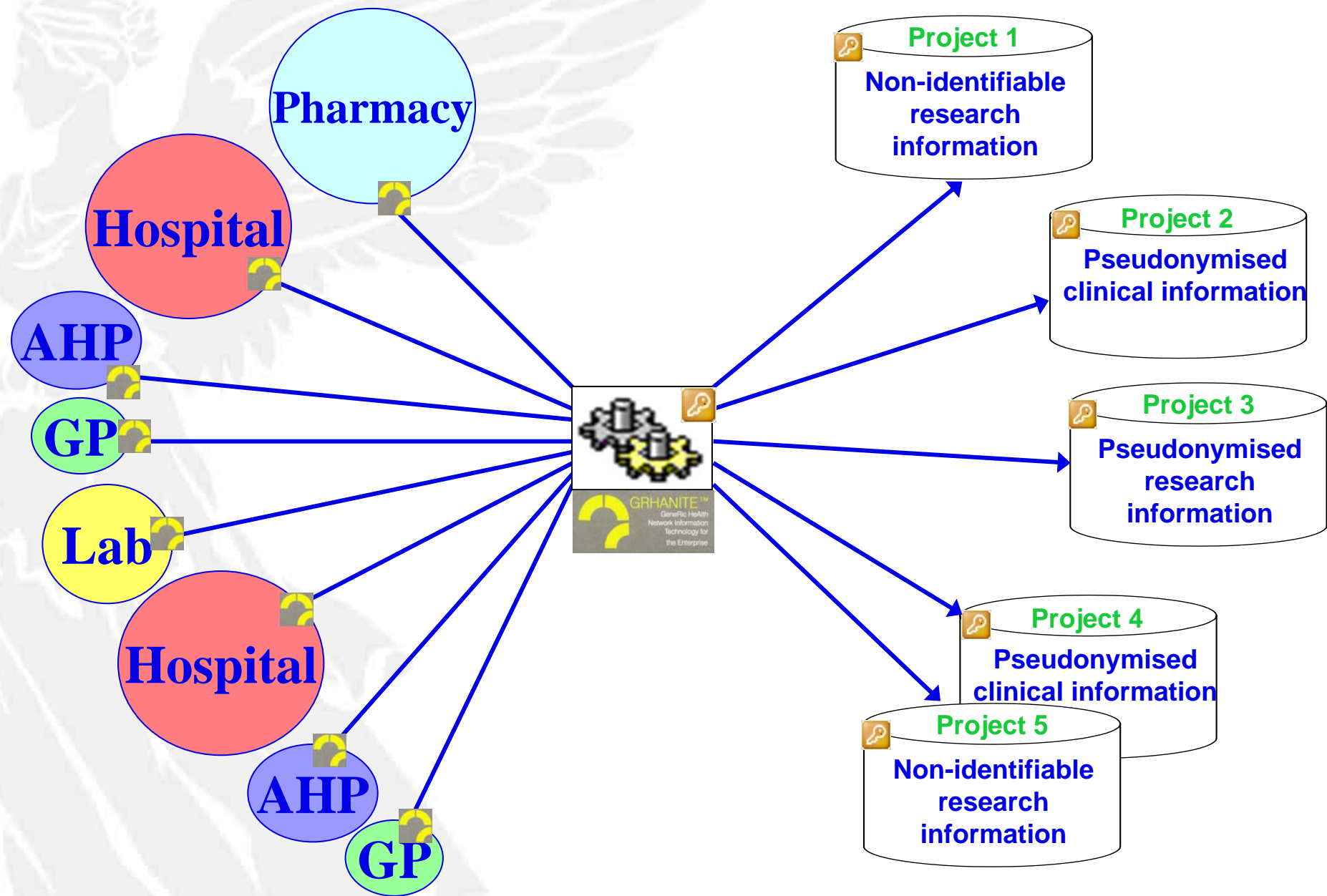**Joe Smith re-identifiable**

cDOpy28aFAKyaqDdq5xo+OhmxGlOMGY
NTyJ1qf+TSHZhC974lkxaixZSdTNGp5ne8
UZPKF2mz0Xgw3QuSWaadwvKlYkKQ7b
mFOPnpjnSHkM=

1   Data only leaves a site with consent

2   All messages are pseudonymised

3   Re-identification possible only in the originating general practice/hospital

GRHANITE™ features

- Connectivity to most major database technologies
- Integrated, flexible consent mechanisms
- Pseudonymisation prior to data extraction
- Secure project-by-project distribution of data
- Pseudonymised information storage
- Ethical and pseudonymised record linkage
- Tested technology
- Peer-reviewed methodology

GRHANITE™ record linkage

1. **For clinical data sharing**
   - *A deterministic method used where only exact identifier matches are permitted*

2. **For research and audit applications**
   - *A probabilistic technique utilising advanced phonetics, blocking and uniqueness weightings to give enhanced linkage performance*

- **Both techniques use pseudonymised information and patient/client identifiers never leave the originating organisations.**

Tested technology

- GRHANITE™ record linkage, using pseudonymisation techniques, has been tested in collaboration with BioGrid Australia (www.biogrid.org.au)
1. Sample: 45,000 records from 10 different data sources;
   - *GRHANITE™ probabilistic and hashed data linkage algorithm is as accurate and robust as existing techniques used by BioGrid;*
   - *Sensitivities and specificities of both techniques within 1%*
2. Sample: 850,000 Victorians and 2006 Australian Census

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BIOGRID
AUSTRALIA
Health through information

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Key Features

1. flexible consent processes during the secure collection of individual identifiers,

2. accurate, reliable and confidential identification and re-identification of individuals for continuity of care, and

3. accurate, reliable and confidential linkage of pseudonymised data for research

➢ *safety, quality & continuity of care*

Peer-reviewed methodology

* **GRHANITE™ currently being used to extract data for national Chlamydia sentinel surveillance by Burnet Institute ACCESS project:**
  * *68 sites across Australia (30 general practices, 30 laboratories and 8 family planning centres),*
  * *waiver of consent from the RACGP Ethics Committee.*

CONDUIT
Collaborative Network and Data Using IT

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Burnet Institute
Incorporating
Austin Research Institute
Joining together for a healthier world

Centre for Epidemiology and
Population Health Research

> Home   > Centre for Epidemiology and Population Health Research   > Current CEPHR projects   > The
Australian Collaboration for Chlamydia Enhanced Sentinel Surveillance (ACCESS)

The Australian Collaboration for Chlamydia Enhanced Sentinel Surveillance (ACCESS)

Passive surveillance has indicated that chlamydia is a significant problem; however it has not provided a systematic means of measuring any changes in testing levels by specific target groups, or assessing time trends with any confidence. The ACCESS system will fill these gaps, and together with passive surveillance, give Australia a robust chlamydia surveillance system.

access
Australian Collaboration
for Chlamydia Enhanced
Sentinel Surveillance

Click to zoom

GRHANITE™ demonstration

Before a clinical site can contribute data via GRHANITE™, they must be set-up and authorized by the central GRHANITE™ authority. Digital Certification and other techniques secure all communications and verify authenticity
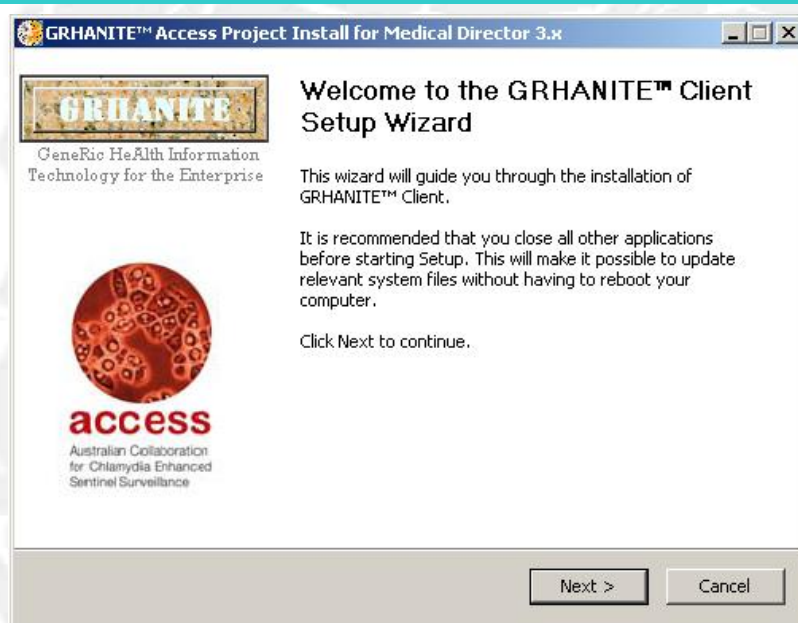
GRHANITE™ can export de-identified data securely to any number of destinations. Each project has a 'definition' that holds information on what database to connect to, what data can be exported from that database, for which patients and under which conditions.
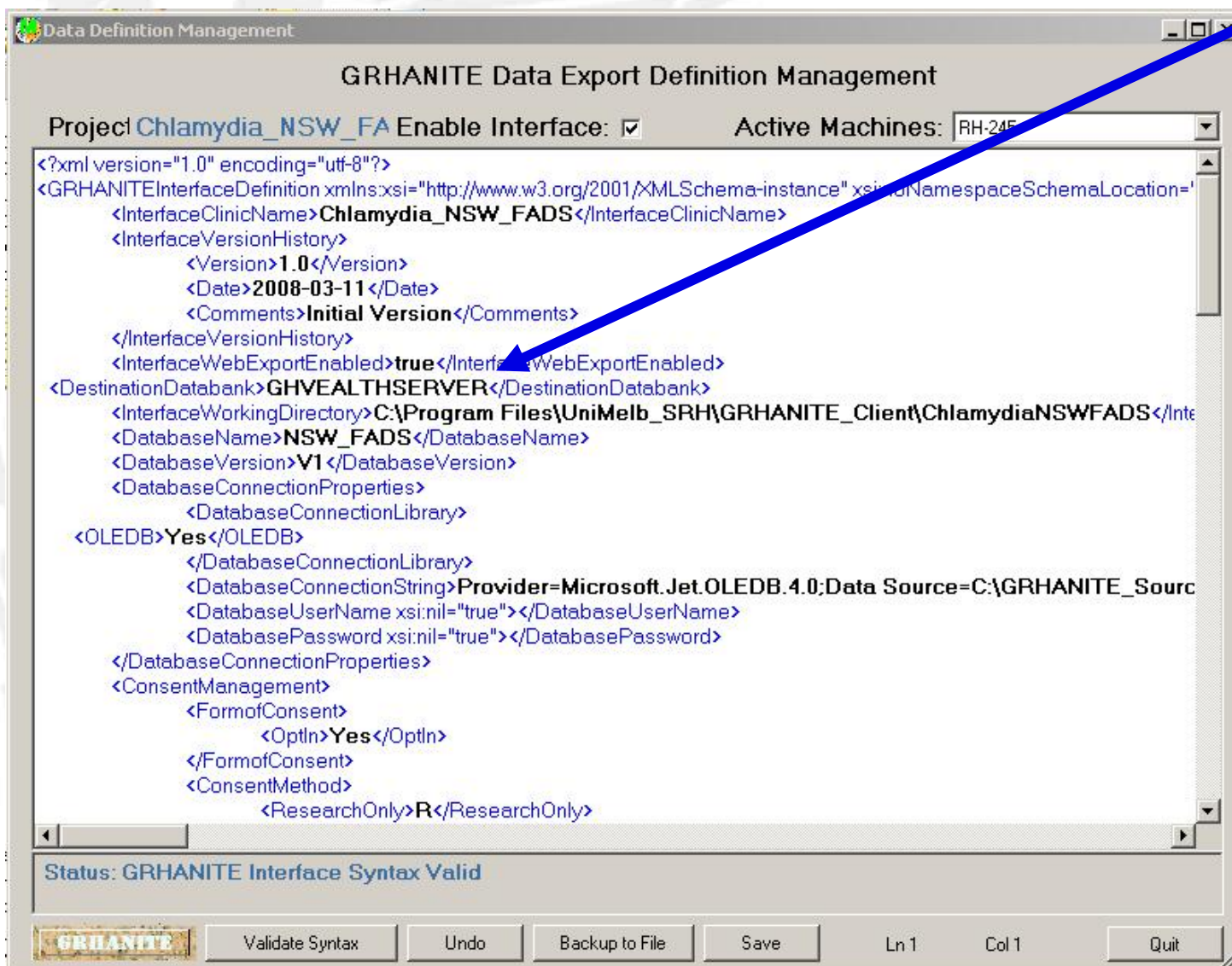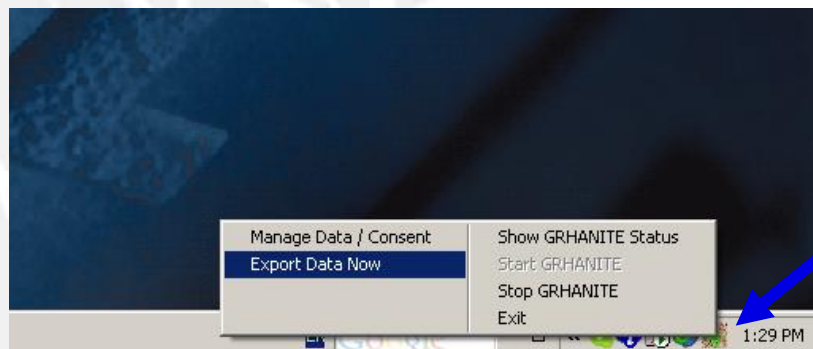
GRHANITE™ Installer: Because there may be many clinical, audit or research uses of extracting de-identified data, GRHANITE™ has a sophisticated system that allows the creation of installation USB Disks tailored to the requirements of each clinical site. This gives the capacity to implement GRHANITE™ easily on a large scale across sites with differing database technologies, differing ethical requirements and differing data extraction requirements and rules.

GRHANITE™ Access Project Install for Medical Director 3.x

Welcome to the GRHANITE™ Client Setup Wizard

GeneRic HeAlth Information Technology for the Enterprise

This wizard will guide you through the installation of GRHANITE™ Client.

It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.

Click Next to continue.

access
Australian Collaboration for Chlamydia Enhanced Sentinel Surveillance

Next >   Cancel

GRHANITE™ normally operates without human intervention. The status of GRHANITE™ and various management functions can be accessed from a system tray icon.

Manage Data / Consent   Show GRHANITE Status
Export Data Now   Start GRHANITE
                         Stop GRHANITE
                         Exit

1:29 PM

Authorized administrative or clinical staff can view and update consent via a consent management application. Where possible, this is done automatically 'behind the scenes' with GRHANITE™ checking consent information that is commonly recorded within existing clinical applications.

Different types of consent can be managed

Consent Manager

File   Clinics   Patients   Security   Maintenance   Help   Minimise / Hide ↘

Login   Logout   Current Clinic: CHC MD3   ▼   New Patient   Find Patient   Find By Surname: ▼

North-East Victoria Rural Health Academic Network
Patient Consent Manager

Consent

	Clinic ID	Surname	Forename	DoB	Medicare ID	Veterans ID	Address	Global Research Consent (1)	Research Consent (2)	Clinical Sharing Consent (3)	Global Consent DENIAL
▶	6	NERK	FRED	12/05/1955			12 MY-HOM...	☑	☑	☑	Click
	7	NERK	SALLY	12/12/1997				☐	☐	☐	Click
	1	ANDREWS	MELISSA	19/01/1993	65002252211		5 JEFFERS...	☑	☐	☑	Click
	2	ANDREWS	MICHAEL	08/05/1954			23 TANNER ...	☑	☐	☑	Click
	8	ANDREWS	SALLY	12/05/1998			21 BEST ST...	☑	☑	☑	Click
	9	LOLLIE	OLLIE	01/01/1800				☐	☐	☑	Click
	10	WAGTAIL	WILLY	01/01/1800			THE EUCA...	☑	☑	☑	Click
	11	DUCK	DONALD	01/01/1800			12 DISNEY ...	☑	☑	☑	Click
	12	ANDREWS	ANNA	08/12/1998			2 KENNEDY...	☑	☑	☑	Click
	13	Andrews	John	17/06/1955			2 Kennedy R...	☑	☑	☐	Click
	14	SMITH	FRED	23/08/1998			2 KENNEDY...	☑	☑	☑	Click
	16	ANDREWS	JENNIFER	20/04/1970	35002651221		2 KENNEDY...	☑	☑	☑	Click
	17	ANDREWS	JULIE	03/03/1956	65002252231		5 JEFFERS...	☑	☑	☐	Click
	18	DONNELLY	GEORGE	02/07/1922	22947244411		43 MAIN ST ...	☐	☐	☑	Click
	19	DILLON		04/08/1935				☑	☑	☐	Click
	20	ANDERSON	DAVID	04/01/1955	41334002751		61 WALLAC...	☑	☑	☑	Click
	21	ANDERSON	PENNY	04/07/1993			61 WALLAC...	☑	☑	☑	Click

Discard Changes   Save Changes

Status: User: System Administrator Access: Site Administrator

Patients can grant or deny consent for the use of their data ANYWHERE across participating clinical sites. If consent is denied, ALL data is deleted from the central GRHANITE™ Databank

All GRHANITE™ activities are logged, and a full history of modifications to patient consent is maintained

GRHANITE™ pseudonymises patient information BEFORE it leaves the health organization

	Surname	Fname	DoB	AddrStreetNo	AddrStreet	AddrPCod
1	VUzWhAn+u0RX0eEmJvScOQ==		PyhgYR+pEeUEZqLmjgp37dS2GBTB6o5FzflhAv7DuoQ=	F7tS4qAgDGpqAQRrl4sdMg==	0Xbs8+oaBJvBE1Cf9eIYKw==	DQTmpX0
2	4/mNJA12+3Ytj/umsFf9A==	IDhGGJ4uAjBdH3rmcJ7wqg==	ctXPSoNo95Bo3eAoNiZicgTpnwLFVff3TfiWkcjGc3I=	Q/04nVtEQyXkZ9ng9c4Y4w==	pm4mJtQLUjeTpIn3bbxECg==	r5Mi20f9I5
3	axL9rPvQJvgdRxDXPVim0A==	TRmWCtbR9QKtpf55tlQqqA==	rK2wpZ2xLesQtuCSvFR4aCz4tqXPJ5eQY4WXRqXylMg=		8Z81SFG3V9/xXg1FeKDtbQ==	qYCOTlH5
4	V4VD3L8/JnF4Z9vJO7bfjw==	VXaVbHDnGMVzi12N2yZ2w==	WFkzhLEHokhs9hVtJzbTgxe2gebp86joWlYPVSVONyk=	qxH/QwguCAnGmdeoAfYp7Q==	rjV22o+iEypo2z3YidUDyQ==	3s3JdeDH
5	A5gOrRuxfnqZfndXpeF9rw==	QxWl6fLiesJksy9TBIskLA==	ZrEcEQ+mnFnqSuVIDPCPe2zRq7sH9vgk1JccFrreEy4=	T0I0mJT4BGt+n8q+0+fl+g==	bHHgOyiJDTrGhgl8wH2JhA==	nr6cA433
6	KRxXibYzDXzWEi7JV34TDQ==	OdwQX5Ma0c2C0PAWqxgz/w==	RVd4otABv1RHQDPy5ff90sJ8RNWm8F2oDuVxy1DmprA=	exnpZcFhRmUmRFPHrNRWUA==	kcrk8xUwRAlkvecaSkNhQA==	3+zKDlHw
7	A5gOrRuxfnqZfndXpeF9rw==	FCF6pSYuuhhgQhKDrZTTdQ==	pd73UlPPCSc9nuJ0Bpm7C9yv3MtsBdD8/gVfn4cErc4=	u9HPyy15HxmNVeX7KJHiqg==	SaGXvnA+WKN12oK+K8Jrlw==	parMdqXE
8	SvZtJ+DjD+SYbd/QjZG0jg==	q36KquvgklKgTHoUS2iUiA==	rK2wpZ2xLesQtuCSvFR4aCz4tqXPJ5eQY4WXRqXylMg=		rM+spj67URDCYnfwJK8JZes1frOzKbTRpuFEs/dldl0=	5aDZlvbq
9	eghfcKEHpWF+VQicprGSvg==	7606RkGbtkPTsC+2PWW31A==	Apap1lpCXIwKe5IA7EqGSfsqFhYjeiGAl3zLSLvFHV8=	rkSxWISIP/NEH9+BLEepJA==	1qx87IQcXUd6tY0Ei80dqg==	hxXGw8a
10	2rwv6mfNDIcXStvFNy5GBA==	xcET9nQGyPR8lyVSSidMTQ==	Apap1lpCXIwKe5IA7EqGSfsqFhYjeiGAl3zLSLvFHV8=	hpEVrHobSbj8GdXTLcARqA==	1Q+NaTifAHXQZt2eA9zULQ==	aalipOE4D
11	JRzubG96kJf8p/F+PTIkbQ==	TiBQr3clo8ojYwJOZe0ijA==	rK2wpZ2xLesQtuCSvFR4aCz4tqXPJ5eQY4WXRqXylMg=	TfIVNhUhH2EJ3Q2cbABbsg==	aVT68qYQvBGaxfnxXec2wQ==	
12	axL9rPvQJvgdRxDXPVim0A==	TRmWCtbR9QKtpf55tlQqqA==	rK2wpZ2xLesQtuCSvFR4aCz4tqXPJ5eQY4WXRqXylMg=		8Z81SFG3V9/xXg1FeKDtbQ==	qYCOTlH5
13	tLQWtW00pf0BYRWeKrJZQw==	2W8KJRgAx+XMPxiXGRC+Gw==	Kf6mO/plVwGl4bS01Kf4IbzpiTr0Afm3RBIO19y6+Cg=	T0I0mJT4BGt+n8q+0+fl+g==	Beeg3dSCuwOKgpWHA7LKKA==	nr6cA433
14	r5B0JuscmsmsVtyT55NY5A==	bvnpayVDgcbwDreF9ynaeQ==	8j64SzI4BZLTh2nAnN9NSJqhAejKozEGhUDIhvX0/ro=	8ajUIGnzr2c5m3vcFuHiAw==	mJByiaH5g5RKgSy5VI8RSQ==	zNZNVKc
15	A5gOrRuxfnqZfndXpeF9rw==	7i8GLj0et6yjo6n1D3yn2A==	3KMpl2PBLo7+k7DIF9hQqUBChJHT/Bieh45ffRneUgY=	Bygd5EGpYyc04nVDagoyXg==	SaGXvnA+WKN12oK+K8Jrlw==	54F3rjDxj0
16	ZSn9cZSGP2C7CuHkbt6WJg==		PyhgYR+pEeUEZqLmjgp37dS2GBTB6o5FzflhAv7DuoQ=	F7tS4qAgDGpqAQRrl4sdMg==	xykTS7n7jtMasCLYWLz+VA==	6r0PvVLC
17	tLQWtW00pf0BYRWeKrJZQw==	2W8KJRgAx+XMPxiXGRC+Gw==	Kf6mO/plVwGl4bS01Kf4IbzpiTr0Afm3RBIO19y6+Cg=	T0I0mJT4BGt+n8q+0+fl+g==	Beeg3dSCuwOKgpWHA7LKKA==	nr6cA433
18	hnc/5UZmthgkbpx2072Fiw==	lUy6WbnE+aX5EtTyjDqHTA=	D2PdpGeljKT15CpfF0EIM4CJJSTQMxBHKsyvOjHYSIM=	T0I0mJT4BGt+n8q+0+fl+g==	bHHgOyiJDTrGhgl8wH2JhA==	nr6cA433
19	A5gOrRuxfnqZfndXpeF9rw==	V3uKd/jS			SkNhQA==	3+zKDIHw
20	r5B0JuscmsmsVtyT55NY5A==	bvnpayVD			VI8RSQ==	zNZNVKc
21	36W/kDF/evHPpf9lLveUeA==	qGCyVQ0			IX0f49A==	yrryF64vV
22	PBzlwaXEC8gckroJzyl5JQ==	BPf7Phcx			/oEiQ==	VtpZ/Los
23	M+X4LjFttBYHnQcsvvEvzQ==	yirwqQC+			YVvxig==	3aZDN8Z
24	+EQAo3klwXah27zLyckygA==	r1cQU9gu			VDp5mFqh65pngp6+bREqqBd...	b63bFbkS
25	xdEwktYq7cx5+wZsKab4cg==	0w9SblA6			ulhIDZw==	/ZMohmN
26	+EQAo3klwXah27zLyckygA==	bltAyKa8UHXKjzrtndd41Q==	eCymbDpcipB5YQBqVLa282Bgs1J/25f2UuBe/mlVaTM=	Q/04nVtEQyXkZ9ng9c4Y4w==	+2Q38MfWVVOf7je3VDp5mFqh65pngp6+bREqqBd...	b63bFbkS
27	V027RopMU/r1rHija5pnhQ==	dwDDRocL1TepkD1T4d1bDg==	Q+t0F0Wrld0/15tACVk5Bv49li8UwFxqA0vgQQf2s7Y=	+J8mtkNfS96eWixNdK5nXg==	nJrW+oZ8NUkoSC3bGzNX+/RSL7KGsHV374RcN...	4kkKVytT
28	eaJ/4Thy73g+bnTZbLswJQ==		XuDH9bG+Vc/U8+ij5X0hGW8ln/DS3j6KLHyE2bn7obQ=	8Vz4fBC4QdKvPeClQYIqyA==	ulRmJj/StZt8CNwxyMbPfg==	yrryF64vV
29	dq1g0P2vlzekN6qlBN3usQ==	C7Zy8y9NbBQLq2P8aZswxA==	u5o0rQLKHDCxmlXoKes/C2FqcqLxF3U/k4yeNSkzWJo=	TNmF9NSvad26xGcCFKEhYw==	m+W5KvX71qFS6A3Sjd04IA==	ywa0M/2I
30	yFtAfp5+v0EnzW6FYiGUgQ==	r2GAd/CT3GjSdMrTrJFY4g==	mIDAb3V6x0Y9+7YA+vFX7fhbFTodoUZ7VsrPZ5sZ5KE=	Q/04nVtEQyXkZ9ng9c4Y4w==	+DysKw0Tpod+01H4RsppRA==	yrryF64vV
31	7A/qU+fYVtcNhr8yoAEdnQ==	yaZY6GG8XH2Gsp7zYG4CXg==	8tdWrLEgQDIMyCVaJwoMVJfkzEpdyAxRnZy2A9mulM4=	uZss2zGkVzT5VdN1iSvLcg==	eRGyNM+m6riS769k1ml8vQ==	yrryF64vV
32	wayAazKyShgUPgwJ9LK4hg==	JnH1JDWxhz054Q8F6MjQNQ==	lxzhLJSKvWGoHLBlho/zuFC8hA42PY36rn5X1NsBNH8=	8sUwloVToO4AAk7ZYO3EzQ==	6Nnfz4vdWW16jfl3xLJy2AAmlS4OCmredPdoKbiVe...	AKsdSNt6
33	P6thIZP+aZILn4lkoXG5ng==	lUy6WbnE+aX5EtTyjDqHTA==	KH7/INZ+7lxD9s5xViSpo1SG/dp6F2Z+7HJnyyn3Fxo=	TfIVNhUhH2EJ3Q2cbABbsg==	Il7TX15cz5mkiFflSnPClw==	QJubBo75

Everything GRHANITE™ does is encrypted using the latest, industry approved encryption standards (AES / RSA / SHA256)

Every time data is exported, a log is generated explaining EXACTLY what has been exported and for whom


```
20070405094343_EXPORT_LOG.txt - Notepad

File  Edit  Format  View  Help

GRHANITE™ Data Export Report for data exported, 05/04/2007 09:43:43
GRHANITE™ is a trademark of the University of Melbourne School of Rural Health

Site   : CHC Shepparton
Clinic : CHC MD3


***********************************************************************************************************
* THE CONSENT PROCESS AT: CHC MD3 (CHC Shepparton)
* Data is only exported where explicit consent has been granted. Methods of
* obtaining consent vary. This clinic inteface is using the following method:
*
* OPT-IN consent is utilised – data is exported only if patients have opted-in
* Data is only exported if consent for the research use of data has been granted
***********************************************************************************************************

The following data has been exported for consented patients:

Patient Demographics            : No patient-identifiable details extracted – dob is taken, but in encrypted form
Patient Diagnoses               : Diagnoses for consented patients
***********************************************************************************************************


Detailed export description:
***********************************************************************************************************
* TABLE    : CM_PATIENT
* COMMENTS: Patient Demographics         : No patient-identifiable details extracted – dob is taken, but in enc
***********************************************************************************************************
No.    FIELD NAME                     ENCRYPTED(reversible)   DE-IDENTIFIED(cannot be recovered)
---    ------------------------------ ------                  ------
1      Patient_UUID                   True                    True
2      GENDER_CODE                    False                   False
3      MARITAL_STATUS_CODE            False                   False
4      OCCUPATION_ID                  True                    False
5      STATUS_CODE                    False                   False
6      DOB                            True                    False
7      DECEASED_DATE                  False                   False
8      CITY                           True                    False
9      POSTCODE                       False                   False
10     STAMP_CREATED_USER_ID          False                   False
11     STAMP_CREATED_DATETIME         False                   False
12     STAMP_USER_ID                  False                   False
13     STAMP_ACTION_CODE              False                   False
14     STAMP_DATETIME                 False                   False
15     HEAD_OF_FAMILY_ID_Patient_UUID True                    True


***********************************************************************************************************
* TABLE    : MD_DIAGNOSIS
* COMMENTS: Patient Diagnoses            : Diagnoses for consented patients
***********************************************************************************************************
No.    FIELD NAME                     ENCRYPTED(reversible)   DE-IDENTIFIED(cannot be recovered)
---    ------------------------------ ------                  ------
1      Patient_UUID                   True                    True
2      DIAGNOSIS_ID                   False                   False
3      RESOURCE_ID                    False                   False
4      DIAGNOSIS_DATE                 False                   False
5      REASON                         False                   False
6      REASON_CODE                    False                   False
```

Data is encrypted prior to export using one of 10,000 randomly allocated encryption keys (RSA public key). The web server used to forward such data to its final destination cannot decrypt any data (decryption keys are only held by GRHANITE™ databanks and each databank has its own set of keys).
This protects data against unauthorized attack during transmission.

20070405094343_MD_MEASURE.enc.txt - Notepad

File Edit Format View Help

SITENAME:CHC Shepparton
2C16890AA66AFDB1C22565CA1D75573D0393E1979B3A8E483F37D15C7AA733EC771593311A48D13AA27F8CBD855EDDAE0BE63C93AD0B67B90B4CEFE38E2262
kZ7d6YGT7UFD3XGGm7ZthK0OLZ1k1GBCYyT2yLC6ii3TNDgj9noqovkxgfUmH+PWQVBZcdh/oR5hqILc6yE2Qp+fTsKob+mGFG+/xh3lP2lHPDkYumXdtYYBP44PZZ
vXZJA0M/qQK8c/+5SfkA/HdYGEZnFEuovoHmIRsQ6YFMp3GAiH0ba7p091U04CRHL0hoBXrHiW653T3rBjhZDsG2tVnjL/nxPVQqJHamVeQdKrJnwH0h89oVYpxBbZ
JzPE6Ys7wBCxXyJoeTATsHwVBPi6wSMzfwo2jkLZlBPJ3mstBf5bgahzwg70ygJ+5sc/nyOmmRpUQIphoQNTPrO1LOkVkQ3iYLRbGiQrcQkgtRBMCggevjn6bnKE9a5
zp4vIun/HQE3QU1Y/oOw+hdSvb+ZGpWzwdGNwgxergETCsfZYh0pPHnzbqe9zqAPSMSjAeRA0OplldYDqjeyPm7K1h/oRIefZdwYmghOGyus7Oh23NAEFECRxCBL55
+BxMCm42VWSb4yLu5VH1w2Hu+gnt9tZ4v+cm2YHQC1+HTsqSJbQDHzZqtmEikV5HJzB6j3XQtvl/KQexe9Ayfi7xDaUvt4v8krgqTzL90GlTX4zno/rJTYxCK1Kn8EW
wGxgB/XH1F/KEtYkmaO1wrwyKKP5YVeISMhMKU1qjmjc9TKweuNCzyx+sGp66P1ebn5XkS9wQyxDD8+ZlpK8H3G2ecEAKyC5Nogq/TeScrxwcnUSettZM03ovT3ii8
gNGC1NhFwufnDKS3MZmv/lDy/Qam3tRbwXvhFvKbbk8KVEim7kkAnTciTYR36KKASubsZwJH+W4HwOpLB1BJER7yc/eE/UrE0hJw0RvpZC+NnOM89GYEwXgthCA34x
/ndGaJU1cQHYdlCfi+PJLAIiydkbPhFpG5BfuADdGwqAb4XPNG5no9mBIBpNEozJf/mkveddaiGsOUL6amTQ2num8pYtAoLsIXIz1SNQvjjmPV1gLUTCG/4EKPKdCc
y8yRn7wj1dRcM7Bxw3jFtwYj+NbXxxfRVoMVbevCh0w6qo6zxq6vKYC1BLYH+XwhLQiH+eSodNB0KObHQnWixVwbeP1gV/oa8+5wA57tcX/FhzWIbiTxbyO/pDZJEAf
p6tIyojHbe15QKLewy/QO5Z8pSReS5ykFE1vQW5DnpigNq7Zeviy0EpkwRMzk/5ycxwII/HfqYpnAzx6AH878sG9ndsDn5poNpmNzPJIXtief2ZRjKVCuCNIKdOpqr
EalZOdIxjK9bbB8ww/6FhTI3mYngTI9y2bc0AgC4smcLkzOvTTFwIemQpCsn0OMbNnzGroPDW44MTA3g3CcwGYGBcSEZt2bABehJuhtg+pJe7OWP4JcHRqzRXX04g2
pAS42RfSBlqSYLyTYhvn6evB9x5CosNJl0GiRdNQJJOpPNv/9ArlGejxlJzNwt0tDZZ3EHpnps5YMZ9ot2TiqqObYkbowJp8N9xIUgIPbO9V2umTK3WlS9e3Ne9IW+
JQA96lyKrCZA5XGXxoDVxY7JqGbghSGQwiM3BuLFwVICtyvd1rwP8KQLOoppGDH6ZIgBetxmcA76U+YsiCExBeIijy33gVE6SxwuhJKG12wX+E46hbyJu0NyRtYDvm
OcR2XHmhNZx/CoKQIRTgFtbV9RbVioBhky35h564k3uLhmlPx41fVwKCskh6YBeFPJa687YnSw2uKtrQpkX9whkdPYmP2fIw2Dhot0YtyBhFybIJxVJatejkD8v6ny
x9N2ut/7sQl3UF/beFU6Fj/4EpoY5UjitxVAFOzqq0l7hLoq/UPh9LNJcdbmTn3Viq5Qz8sZEWSlwbgksXdtJNZ7jTMs0WXp9O3CgQAGc4bwtpUphTKCw852oyvkuv
OmEgIiNg6TCzts9zoXDCJnS4kgOFTCCFASimXANnnmN7QwskyeUXNPH3zrBg4o+NiGF8fnNyhbFq1Ye6n3d5XvwJHmwIu5yPFCVqF9FVjmRiLOSLJZr4V9ArPxvfQN
tbxIDljlTbw5HUfzcEbOw+h1L7UuzJ7Enhzl0qPejdqyxffk7wmoqfTA6YGxaDYlzLIR/tc8GhvSCmUnoficadNmWpxhKTdRdt5XyVbD66nas1k32gPKXGeYg9d5Ssr
B9Rbrz8MI82my90uZ9HZosNNIFCDmiNxYowoH3+sTVsEmdzvhwIZko0/+jcqo0cQHvmFOJkhchqQIBhInh2ls+xgDnNkgEr/kG8CfmavhtF/x+rBC/6S86/1SM+Pxu
Qjb40flPABOu5/rtZD/B9fL+qyON3Jr5U+DnU3bkhIh/qMdCn6PP9E7XBwdaCwelRbpxrhHursESVYO31jjwvkYQvPH8ZtN3kfBMAY/zFonUkYwEppz4c/VZ6O9pZQ
ukG/65er3oClJ2DISto8xilm6Ip62Ef3hVGK+7a7dcSWUBU2lQBduQ/vhgMB0dg3SOJ+7Mo04GRliktfa8oNENMEtwoip4WvZFKhO9t4J3HIyxrewj7IESLsDT9H3k
ohZwOw/7PyUDuCYLnZBZ+IlkxsyzUnm1q9UlHPX1MFBkQVyrFcpJ28KRrTOE78YB8XwqJhPzyEbPH0LZ+EaHQF6irP14OPYy/OC4+Erf/hBTFXVXCP1tTpxBnAvywC
sHbfhHhdHXFM+YoyqgI7PxhL9CYMTidNQY9kRg/2KRTmXsHOIeyy827sYdEHY2Qw/yumfTJ8lQ1zRasfce4GqQawC2AB2PfSvqR20T1bS+iLtnkqmqT2wSvo5eFXwc
DVsVd2s/qipyB42Kz1nEEMp/k2h3d6SRv087cN1YHBDbXpL+G8gLOIoEgSTx54cVNpHoUvkjRU/vTxAWJaPU06cgZd/ZpIRyGU45euejgaE4MScHGSgPQugbY5VMkj
JJrhl6nmHZLo56cZXBnkbvMI4Y6AJSRlNZ+gha9Mw0ahT4I49OZL0KAqsNR3c6cexX0x8f08FHoCKYwILBoonwq6GF5bZ6jEAJq7Xvn8sP3/Q2BHm8+dl4QGx+NzCZC
98tnABFZIrn0LEprZ+BAkEwYArpBMiihx3wwrflAJ+I6qICzjeaC9MvjyUDx0gDTFr4Ufb67I07vX/7wj4V83sEwbM8WIgLjE5+qdVuB+CcpwKhJmdaP5f7JYvHQJJ
uOFCA2PAJTuiJcqmwy2ANxBqbAAzZX/hIlwRclC8iioN9a1Y6rkTLcerOJCFr41CTUXxtZgwlc/rIQ1uYPY4ucfn098+H+iDhrNvZchcNE1MrADaEwb9pB5d+zfEJu
OQ+Lwo/k+hbGmbslIIBKz7m+zwKBobwjuSSI16PlxAZwvmebwHN8NlCUovk3L2fjL+psJXAfe20PjK0S8aJopSI+GOQPfrtkCPcMFM9c6juek/3Lws8R5FtaxBDJi3
9UKBbdMU104hvPN5ow/vz3JbxhfK1DHrjBfG8k4TNG2kB3TuiJJvoKB8iQIJcLUp3YS1FTz4C8iKO/3Nr/dHyiq4HAxD1BSZUYUtYXt6kGjFgTKO6fsMxxKlC6aK2+
otuj5VlnBuqP5fMqFqRR/V1ypW9Ldall5RYDDiYy+vDS6VvsafIc4LhNUkThH/PWM/zcdvpv7Td9LbocReb6c5izo9pJYCTz2Cwm0SO+1Jsbilnrvk1/cJuWys4FgC
e9wErwsH+1n7pFwnhZqcn3f8x5uCa80Lcl1KhA6qAd/Mi2UbHHMo5UN5A7j6ODNDOjJ7PCO8vLXIB4FSp2b/OQppcHQMCA89zrfkKcTYOFk8KQEUqHa+eOyk3OfeJ2
1RfgEz7gEGIbCsNllX5FPMsp+RQewdOwc1dwaFcPXXFb16s8mn7INIMVhZFXhwb3AMneSp7fRviAYAYs3kgAeb1lvQTFxuvS/4d2SkIsruDYQdv6HDV0hjA3ywK/QC
wJZqYpqi2VpZU7savBWKXzJoavXJLiU0xlYxUEzxasYVG3dGngGIKK0MUu3I20UUKY/zoX3jS9gbNR0bRJOmR3dqLHw/BSgjeU4hI141so760Sy96rhmmrqw5mcLgC
Cg+kwBr4ZFfV/IGv5ohGrfFuzYFl5AKQAMNnotsuBYXNxfxYgy3rIGrmXntzUpJy5Qwr4ppmx8iB3vBn6XgMJc5tfHV1TJ0gO0/sNzK895Jxx4M9xhHBgQtfHyGzD3
ZQOhJyiQBtkQTS8wvrGYW5HXierDaPbo6tvUknTRQBlwNlTmwYoQ+vMDMg3kiDGreip5YieLqGFlSJP+hncxn/Yxtw8wlscRmCND7F0G+eKNC0c38d1w3ExgakgHHm
KNghFas7vEkYVGsolSA6aC2VZo3quTA7yRGU1xU96Qf4qJFOkXeQHMv0wX/y7b7C/ngciP2tKd38wjXvUNnMrX7umREkX/upxzQzkhnnJg4jgmc+7ioGN9Ye5cL2MD
pfIRfhqsYulbEPKquhKbm8vZT118bCLOKV83EykLIRaj34MQ7TtENUU8Rav6IqwGYjda5+trcfJpNTrLUlFLuuMq6V9Cpc3Lok1SdugT6pHcIv7nq6738BjjK2+6yc
2GM0GkV2q5KuV5I8AJpjM8OpAhDRav9OfaKx3OMO+/qjRk52A0e93VxbBX2xCX9wcvOzTIhxpSXHRCJnDw3TtxiMI/LQB3zWRN/Oi0fR+e/grtrQIMRLGoVnkcjAN7
gkqakmaxjlQBKuoLeAXcJO8DkB3JvPewt0S9qoLXBkz+B2YkTo3c+HEFLuk1vm96LZQ3MxGVRocYtHvuoaBCPWOcaQNAsoYULq9RytxRbeDfMjgf0kw9Jnatts98vL
FRolD3uThTr35OKnnVE3SO/oSdjdcPMLbvfLR8u3gOD5/LnNN9X/df6Nsqbs+UVxKMKXtPUWYq3Do9vPUUyRAewhHwsJosLRVK6qEFQAmhurZ5sDxLuD6TfSRitwwm
G5aA3O4LRbdoTBC4gnku5G4xJek4VFxVlc0DzHHGrZfH50Bf3XFgDUjPIbRiM5CGTyTx2nNYFq7plLM3bLoQdETt3F+MaLU+SinRO1+uSMMClXNWc3nCnyikO5gVSw
jxHZa8lMyYr5wxtrjK1qwzfb7ProERArMg70380JdlUimvaBlDDAwox+1/lPF9+JwBk9N6RonPzaH1n9SeQlzKZii4bqp/wg3Tw4GryRH7sA+mNCS7pfrNPC6V14kc
b0Uzo7nkQLuovabfXi2BqdsABkzsM0m1cKnhGyT3tqabAZfpoBaYExwC4CYBwJPpnGt+JNN1FoLjaDhClvx5JDHx5vmvOfow4N1IaeF9uww7radeOERzuOtmhuNH2x
k7mPZXdGIla3g6Shfm2V8MDpeqKEs3FbsZvgTM+W2Eq8+LOTUoPih+wALpvqkYofkoreB+HtwiQUoXRF1xQqn6OILqv4xOViqAIXHzhHg8vqetADQnVWcSXIOnwsgc
O6OD2W5OwZc2Ldxds63hbgKgCBQ+tAWbzGuekwrKqk+1PwsFN2j8k7uHZLqkMxR40j70IdgNOnU4P348nmrwr6DacIUtbnswcun1NwiIGm/55w21835vf8KOrS/5v7
uhbDCDC+Clp1amCgl9v+/wkhHzti84K/wuL9Rlnr6w5l2hin062vilb9axll xzRn03llPP6aiAdlzD8a+Mua4ZvaiqKqv4PKq00kd2mtT3U81x2OwclyrwuiTiSZk7

No person-identifiable information is extracted. Below is an example of the information that is used to link patients in the GRHANITE™ Databank

Patient_UUID	HashType	Hash
88693834-84b5-478b-9c90-0058bbc6611c	5	j0OXm/un9hzOia5B2HO0pGACSTWT2Cls3VR6ez3kiPJiECtRb5ICEdT/KMzoJXaI24dXENVdA18xc/h9X6boljdWTQS9qUROmE5adIKIng4=
88693834-84b5-478b-9c90-0058bbc6611c	7	7WMmFzuuQjvKwFsO27+S3uUKRrxE+kW5vZ87Iv9Y86K2tmfK9EvXXOVcG5AN8Q9ngTBe400AzaUcoTtJ3rWKCVaf1zfzeqvi5CSoed55w5A=
09442fe8-e4b4-4653-a750-0184f39d5f44	5	lNTGcWAgvq8m+hWQxxsuHKUhRtp4TT8aDBSEq4UgedmL9IUBvA9mDKZG4DfNqtWV/OX3BuGgdhEBOFv6PgU2zHpNCR1XMa/xaHi2JBsA7l0
09442fe8-e4b4-4653-a750-0184f39d5f44	7	q8va4jildeq7RJhD5WEtHs0aeaNkiMNyOXf7Y8JHa4VvJcZXZXGhaV3WHbLBQ9aJ5yqSPTTZlmAr/6jd/zFRwSXuPe4YPK4M17WtrgW0N2o=
09442fe8-e4b4-4653-a750-0184f39d5f44	8	WuUWF65On43D7mYnUTa17EsQBjnUUgLDdJQ3cRowgheeOdhM7A3dlp27uI+8TliBX2Nf1dyPWUQOa7kr59nPfQnfHimwcPKUba+M/YMCRhjQ
a1b51347-91ef-40ff-990b-043ba2a29421	5	ynVWD2T57U5h+eKiLaxOw00zRDB8apRfgaHyxu1pAUbfi5sIfRqDUjCMMjCSdchD+uXg3diVJruGi7/OM0qJsB8Jfdok/8uVVBYC/eBTO0E=
a1b51347-91ef-40ff-990b-043ba2a29421	7	9B2k/Rw3ZDEPPCgJyOE4eNoS869feXvAGq4suZHdr91Zsj1t19OpDRwrSO8mcKhTsan51tC0h2OrDe1O8cWS8NMb7mqAwwN+5MxZCPNhPJ
a1b51347-91ef-40ff-990b-043ba2a29421	8	rqz2XVN12uw6Wtg0nW1nI/LM1RsX0ntuUZGF+oqhBPZGQtiVpuFHFIYyUEhnBXt3ADxcUUgo/XIkIJWsW4i35dy+5Yd8551toDT7JsVyaSc=
3aa10887-016d-490e-8431-046e0292b1f1	1	9kmu3wWHTAOwsO45YR9Fj9JZgCDCp3ziYseRPYawBbYMdkIrc6iCiyzc1cD++qN1e7jqLIXbqe4TMDAHWy40YyrUkN/qToCY+OKaFCmHWA4=
3aa10887-016d-490e-8431-046e0292b1f1	3	YDAtI0Hy9AabW7tIgKPwySMFtdLUgsXPuC3oTSn/bt1BrT7JxSMiIHeegWDt4kwyWYh0dk1OI8yAAqXbbCDJUaiRFXEkSEr71eZHEGGNyso=
3aa10887-016d-490e-8431-046e0292b1f1	5	rJfm3GCMrYAFuxrpYPeVlt9kmUs7W4iyRaOVq2XFkQNk8ADiHowmiRopWuInFtmkv38F1G+REJP2tugoGUVonCnzJvTXCuC6q/rqjXYSlhE=
3aa10887-016d-490e-8431-046e0292b1f1	7	lk7203VVWny4lOzegWQE5GpN+y7zEePXpl4ITm7zJWN+VuTX4k7vVOR6yP+SeLRSBnCUZOB4v3xZlEeY0fjhyBs5GPW/UOeB1X/u+5ulP4k=
9765d1a0-65ae-4609-b830-047a51ca9f6f	5	j0OXm/un9hzOia5B2HO0pGACSTWT2Cls3VR6ez3kiPJiECtRb5ICEdT/KMzoJXaI24dXENVdA18xc/h9X6boljdWTQS9qUROmE5adIKIng4=
9765d1a0-65ae-4609-b830-047a51ca9f6f	7	7WMmFzuuQjvKwFsO27+S3uUKRrxE+kW5vZ87Iv9Y86K2tmfK9EvXXOVcG5AN8Q9ngTBe400AzaUcoTtJ3rWKCVaf1zfzeqvi5CSoed55w5A=
c2a9ac18-125b-423e-838c-05167a0e340e	5	3aqUId/ksBoNg7OLpJ1avqcsFJY869JRiiDoDbuL7LtH3HkCdzOjCWlFS5kPvXBIqcNe3DErN/BL0aksjUBsUnzVbpS365dEjOKng7Nv25a4=
c2a9ac18-125b-423e-838c-05167a0e340e	7	BWUFnW+qVQmxtyL92w	gCgOBJkl5waruk=
c2a9ac18-125b-423e-838c-05167a0e340e	8	2QDF4deZTOcDtheWJPy	qLtcecFqVc19HfU=
0aa28542-6831-4c88-a4cf-052c2697b100	5	SMCQ0bdVMvme9F4/7wz	VGziLvupmJjAJyidTw=
0aa28542-6831-4c88-a4cf-052c2697b100	7	0ETKdHn1fGw486DBmO7	5iRaL8NkYy9mcAIKA=
0aa28542-6831-4c88-a4cf-052c2697b100	8	ufMtnGEIZJip54UPX+X0X	8MSVKxeRNxHg47jg=
1edaa12c-62ce-4d42-931f-05b8e06eab71	5	3R8U7gVRBjnfhybJcof6y	SS0jYiQUyos=
1edaa12c-62ce-4d42-931f-05b8e06eab71	7	oFuK0oot769leG8zhtaOW	YJuz+S+NMPZUE/0=
1edaa12c-62ce-4d42-931f-05b8e06eab71	8	KoU6rMe9bf0TF1EU1yX3	D97WV5TjymA=
d98a0c52-2109-40fa-af80-07a169cd93d2	5	7kIya5pu4WDmScoQPwc	1FxdPf6EI/RM9BWc=
d98a0c52-2109-40fa-af80-07a169cd93d2	7	bQC/TrHtAaXWZ9tmjPmpkYhuyEY7ykzsozGQ3WRQPwRUfPSJxgXC36FqOv00IzPGbfEY2yRJTtb51IVPNJYD+fZZYYmKA/LbS/mYB5ZwJrM=

This form of encryption is non-reversible and heavily protected against dictionary attack

	Patient_UUID	TYPE	MEASUREMENT	MEASUREMENT_DATETIME
1	3AA10887-016D-490E-8431-046E0292B1F1	HEIGHT	92	1996-07-22 00:00:00.000
2	3AA10887-016D-490E-8431-046E0292B1F1	HEIGHT	102	1997-12-21 00:00:00.000
3	3AA10887-016D-490E-8431-046E0292B1F1	PEFR	67	1996-07-22 00:00:00.000
4	3AA10887-016D-490E-8431-046E0292B1F1	UABLOOD	++	1998-09-16 00:00:00.000
5	3AA10887-016D-490E-8431-046E0292B1F1	UAGLUCOSE	++	1998-09-16 00:00:00.000

	Patient_UUID	GENDER	DOB	CITY	POSTCODE
1	A7D44E22-5106-4F4B-9FC5-1ED131E36035	M	W9qT0EFeQnpEyHddnumtn2kstZ5zOm56WPsKLcaouKU=	zqOKpZecyNZO4JASt7Pm/Q==	4000
2	94E97F4E-5B8D-4EDB-BD97-1FD8AA640175	F	ZRy..Qq2XdMoIP3DVnaRDiUApAarl22ICLDcW5q3fqrs=	40bRrX8+PcsYBd+7Ax8Mhw==	4523
3	AD52F603-1266-450F-9A67-20F034BA1DDE	M	sbE0h..kqswtG6JNNRTs1beEiqRG1rL/2q324q1zJTAzQ=	AqdQj/qog/C7vJ06wD5l2w==	1234
4	DA3E00AB-43C6-4CF5-B702-373A31915399	M	8YQa2..J6fIhXWedX9nvPIp71MMrYwZui01tdKwJ8Jn4=	pT+KLLRHrv7Q0+zR8sElpw==	5678
5	77CDF8BA-F361-42C4-ACB6-3C5AF27F036A	M	nAqZcJD..e6cKAb//WMkQLvgcvTPTNq+fssHSEqUbLoA8=	40bRrX8+PcsYBd+7Ax8Mhw==	4523
6	CDF59477-DDB0-48D9-9987-4AD547C86575	M	PI1PnWv..ux22zQBAXWVY+uTbZRk23PLUguWbPDVatGU=	520ZDcs6LXXBVvJ1I1BLQQ==	2007
7	1BAAE2CE-5EF6-4061-950D-4C1BA686563F	F	mtmo3YiL5..n4vtjsS8fk+Orals810ehJrKvN0Gb4q1U=	zqOKpZecyNZO4JASt7Pm/Q==	4000
8	E41D464D-C2FD-4EE1-9A2A-5CDD1A6BA3B2	M	gha7ZKN1V..YfaCHxKGIoKR6x4q3GYA6FXRUu4IKMs9U=	AqdQj/qog/C7vJ06wD5l2w==	1234
9	341A9327-4543-4E69-A25E-8D56				4523
10	2F738F11-6F36-4ADB-A35E-9333				3000
11	C1F714D1-4602-408F-8C22-988D				4523
12	4E4054F4-79DC-4C13-8173-A04F				3256
13	759A4A18-86B9-476D-B7FD-A58				
14	8C777C43-E7DC-423F-AC7F-A5E				3000
15	22D57F8D-F1E8-4605-B3DF-BDEB5C2F999E	F	dzo1tdJxWfaujrM1JZLWzb0DUYKYe3JoGkRxJ9Z7Rk8=	AqdQj/qog/C7vJ06wD5l2w==	1234
16	AF2821A6-0868-46FA-819A-C342DEEF354C	F	hztApWnQNaJ839DyK7xRnWSB0uXHKUp7efLrW+LFnnQ=	40bRrX8+PcsYBd+7Ax8Mhw==	4523
17	4F15E0CC-5A9C-49F8-BB0F-C6E27CDA517F	M	mtmo3YiL5wn4vtjsS8fk+Orals810ehJrKvN0Gb4q1U=	ID0BGTasgKqCSb1zIY+Vvw==	2000
18	699FD06B-97C6-46BF-BD62-CC63823AF941	M	maPnqwiaim9Z0IaY2SnRvYoeVkO6gr6CF4GRUPN+a3I=	7HTU1I//TIgEPIhHBnhWUA==	3011
19	09700787-FB56-4308-8A01-DF31FB983F09	F	bguolbnjTqoEVJJfDj3C1EMZliky8Z+i0oCwrb+qo4I=	A7xZIRQV/v7vvnKORpYLCQ==	3256
20	E99BA71E-974D-4BC1-B8B7-DFCE701E0481	M	AAecy79kxIU80Au7/MZVS13du6/JVAf+cZg5vCuMp6Y=	40bRrX8+PcsYBd+7Ax8Mhw==	4523
21	362BBA1D-041E-41F3-A268-E286C652E1FF	F	1admxupNa25xkleY5eq1kIFxUd6LpSFaguhJBT2BW6I=	gIZIfigMNB2qyTVjRzt6iw==	3107

Some data has additional encryption because it has been deemed sensitive. Date of Birth has been extracted here, but can only be decrypted for research use if a specific study requires age-related information

30	341A9327-4543-4E69-A25E-8D56584264AC	DIASTOLIC	88	1998-08-13 00:00:00.000
31	341A9327-4543-4E69-A25E-8D56584264AC	DIASTOLIC	70	1998-10-28 00:00:00.000
32	341A9327-4543-4E69-A25E-8D56584264AC	DIASTOLIC	95	1998-11-24 00:00:00.000
33	341A9327-4543-4E69-A25E-8D56584264AC	DIASTOLIC	70	1999-01-25 00:00:00.000

Patients CANNOT be identified in the GRHANITE™ Databank. However, patient keys provided to authorized users at the originating clinical sites allow re-identification

1. A list of patients requiring re-identification is saved to a file

2. An authorized clinic user looks-up these patients at the clinic / hospital

Benefits

* Generic interfacing capability (no reliance on any individual standard or system)

* No collection or storage of person identifiers; (pseudonyms)

* No need for 3rd party key holders for record linkage;

* Strong technology and methodology arguments for opt-out or waiver of consent;

Given the above, GRHANITE is a key enabling technology that:

* *Simplifies governance requirements*

* *Facilitates clinical audit, research and clinical data sharing*

Future & scope of GRHANITE™

Any questions

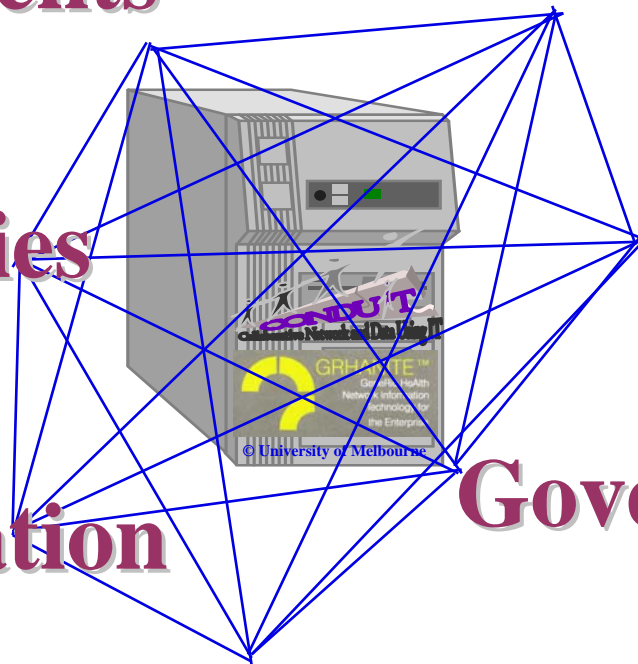www.conduit.unimelb.edu.au

www.grhanite.com

GRHANITE™ Operational Flowchart - 1

Hospital, GP Surgery, clinic or other

Originating database e.g. GP / Hospital Computer System

1 If access to a database is restricted, GRHANITE™ can work from a data extract prepared by local IT staff. If direct access is possible, skip to step 2.

A data extract file (in pretty-much any text or database format) holding the required data is produced.

2 GRHANITE runs automatically connecting to the source database, checking consent status, de-identifying patients and preparing the data for consented individuals as an encrypted file for transfer

Encrypted and de-identified data

3 Using encrypted secure methods, the data is transmitted to the GRHANITE™ Web Server

A web connection is required. Firewalls are not normally an issue

GRHANITE™ Operational Flowchart - 2

GRHANITE™ Webserver located behind a firewall configured for web services comms*
* This can be hosted by the Victorian Partnership for Advanced Computing (VPAC), Melbourne

4 The web server receives the encrypted data, but does not know how to decrypt it. This ensures there is no risk of a hacker obtaining any useful information. i.e. Web server is secure.

→ Encrypted and de-identified data →

5 At a scheduled time, GRHANITE™ databanks retrieve their encrypted data from the web server. This can be a manual transfer for ultimate security.

GRHANITE™ Databank located at an agreed secure location

Decrypted, linked but de-identified data for audit, research or other operational purposes

← **7** The databank computer automatically record links data from multiple source databases.

← Data ←

6 Encrypted data is loaded onto the GRHANITE™ databank and decrypted