4TH AUSTRALASIAN HEPATITIS C CONFERENCE

Strategic Directions for an Expanding Epidemic

NATIONAL CONVENTION CENTRE, CANBERRA, AUSTRALIA
31 AUGUST – 2 SEPTEMBER 2004
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On behalf of the Australasian Society for HIV Medicine (ASHM) and the Gastroenterological Society of Australia (GESA), I am delighted to welcome you to Canberra, Australia and the 4th Australasian Conference on Hepatitis C.

This conference is the leading Australasian gathering for hepatitis C research. Previous conferences have been held in Sydney (1997) Christchurch NZ (1999) and Melbourne (2002).

This unique conference brings together speakers and participants from the widest range of hepatitis C interests. Five major streams in the conference reflect this - Basic Sciences (including virology and laboratory diagnosis), Clinical Medicine, Epidemiology and Social Research, Public Health and Prevention, and Community Responses. As well as having world-leading expertise in each of the Streams, this conference endeavours to engage participants with different sectoral interests in dialogue and facilitate cross-fertilisation of ideas.

This conference will also include presentations on hepatitis B, as the conference moves towards becoming an even broader forum for discussion of issues related to both chronic viral hepatitis conditions.

The 4th Australasian Conference on Hepatitis C is the only occasion of its kind in our region at which such a broad spectrum of the hepatitis C community comes together. The expanding epidemics of hepatitis C in Australia and New Zealand call for a multi-sectoral strategic response, promoted and supported by government. This conference in Australia’s national capital provides the opportunity to facilitate a concerted response to a major public health issue for both countries.

I thank you for your participation and I hope that you enjoy the conference and find it a stimulating and innovative meeting

Greg Dore
Conference Convenor

On behalf of the Conference Organising Committee:

Greg Dore,
National Centre in HIV Epidemiology and Clinical Research

Michael Beard,
Institute of Medical and Veterinary Science

Jude Byrne,
The Australian Injecting and Illicit Drug Users League

Ed Gane,
New Zealand Liver Transplant Unit

Margaret Hellard,
Burnet Institute

Skye Jewell,
The Australian Injecting and Illicit Drug Users League

Stephen Locarnini,
Victorian Infectious Diseases Reference Laboratory

Kerry Paterson,
Australian Hepatitis Council

Jacqui Richmond,
St Vincent’s Hospital, Melbourne

William Sievert,
Monash Medical Centre

Levinia Crooks,
ASHM

Nadine Giatras,
ASHM

Nicole Robertson,
ASHM

Rhian Jones,
ASHM
REVIEWERS

Robert Batey . . . . . . . . . . John Hunter Hospital
Michael Beard . . . . . . . . . . Institute of Medical and Veterinary Science
Scott Bowden . . . . . . . . . . Victorian Infectious Diseases Reference Laboratory
Robyn Brown . . . . . . . . . . Hepatitis C Resource Centre Auckland
Cheryl Brunton . . . . . . . . . . Christchurch School of Medicine and Health Sciences
Jude Byrne . . . . . . . . . . Australian Injecting and Illicit Drug Users League
Paul Desmond . . . . . . . . . . St Vincent’s Hospital - Melbourne
Kate Dolan . . . . . . . . . . National Drug and Alcohol Research Centre
Greg Dore . . . . . . . . . . National Centre in HIV Epidemiology and Clinical Research
John Dyer . . . . . . . . . . Fremantle Hospital
Geoff Farrell . . . . . . . . . . Westmead Hospital
Mary Fenech . . . . . . . . . . Department of Gastroenterology and Hepatology, Royal Brisbane Hospital
Rosemary Ffrench . . . . Burnet Institute
Ed Gane . . . . . . . . . . New Zealand Liver Transplant Unit
Jacob George . . . . . . . . . . Westmead Interferon Treatment Centre
Eric Gowans . . . . . . . . . . Macfarlane Burnet Institute
Paul Haber . . . . . . . . . . Royal Prince Alfred Hospital
Margaret Hellard . . . . . . Burnet Institute
Skye Jewell . . . . . . . . . . Australian Injecting and Illicit Drug Users League
Allison Jilbert . . . . . . . . . . Institute of Medical and Veterinary Science
Sarah Jones . . . . . . . . . . Australian Hepatitis Council
John Kaldor . . . . . . . . . . National Centre in HIV Epidemiology and Clinical Research
Carolyn Lang . . . . . . . . . . University of Queensland
Matthew Law . . . . . . . . . . National Centre in HIV Epidemiology and Clinical Research
Sharon Lewin . . . . . . . . . . Victorian Infectious Diseases Service
Stephen Locarnini . . . . Victorian Infectious Diseases Reference Laboratory
Stuart Loveday . . . . . . . . . . Hepatitis C Council of NSW
Lisa Maher . . . . . . . . . . National Centre in HIV Epidemiology and Clinical Research
Geoff McCaughan . . . . . . AW Morrow/GE Liver Unit, Royal Prince Alfred Hospital
Annette Nesdale . . . . . . . . . Regional Public Health
Mary O’Brien . . . . . . . . . . Australian Research Centre in Sex, Health and Society
Kerry Paterson . . . . . . . . . . Australian Hepatitis Council
Bill Rawlinson . . . . . . . . . . South East Health & University of NSW
Vanessa Read . . . . . . . . . . Prison Health Services - WA
Jacqui Richmond . . . . . . . . St Vincent’s Hospital - Melbourne
Geoff Robinson . . . . . . . . . Wellington School of Medicine
Joe Sasadeusz . . . . . . . . . . Royal Melbourne Hospital
William Sievert . . . . . . . . Monash Medical Centre
Mark Stoove . . . . . . . . . . Deakin University
Cheryl Teng . . . . . . . . . . AIDS, Hepatitis and Sexual Health Line
Joseph Torresi . . . . . . . . . . Victorian Infectious Disease Service
Carla Treloar . . . . . . . . . . National Centre in HIV Social Research
Jack Wallace . . . . . . . . . . Australian Hepatitis Council
EFFICACY

PEGASYS RBV reported cure* rates in chronic hepatitis C: *1†

- 75% cure* rate in adherent patients† with an early virological response1
- 63% overall cure* rate2

PEGASYS RBV is the only pegylated interferon significantly superior to conventional combination therapy† in genotypes 2 and 33

EASE OF USE

- ONLY PEGASYS has a standard dose of 180 µg once weekly2
- PEGASYS is the ONLY pegylated interferon supplied as a pre-filled syringe2

* Sustained virological response (undetectable serum HCV RNA 24 weeks after cessation of therapy). †Patients with an early virological response receiving at least 80% of each assigned drug and completing at least 80% of scheduled treatment duration. Interferon alfa + ribavirin. Before prescribing, please refer to Approved Product Information. Roche Products Pty Limited, 4–10 Irman Road, Dee Why, NSW 2099. ABN 70 000 132 865.

PBS Information: Listed on the PBS from 1 November 2003 as a Section 100 item. Refer to PBS Schedule for full information.

*Sustained virological response (undetectable serum HCV RNA 24 weeks after cessation of therapy). †Patients with an early virological response receiving at least 80% of each assigned drug and completing at least 80% of scheduled treatment duration. Interferon alfa + ribavirin. Before prescribing, please refer to Approved Product Information. Roche Products Pty Limited, 4–10 Irman Road, Dee Why, NSW 2099. ABN 70 000 132 865.
## TUESDAY 31 AUGUST 2004

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<tr>
<th>Time</th>
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<tr>
<td>11.00am</td>
<td>Registration</td>
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<tr>
<td>1.30pm - 3.30pm</td>
<td>Opening Session &amp; Strategic Directions for an Expanding Epidemic</td>
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<tr>
<td></td>
<td>Royal Theatre</td>
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<tr>
<td>1.30pm - 1.50pm</td>
<td>Welcome to the Land speaker - Don Bell</td>
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<tr>
<td>1.40pm - 1.50pm</td>
<td>Greg Dore, Convenor of the 4th Australasian Hepatitis C Conference</td>
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<tr>
<td>1.50pm - 1.55pm</td>
<td>Darrell Crawford of the Gastroenterological Society of Australia</td>
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<td>1.55pm - 2.00pm</td>
<td>Jack Wallace of the Australian Hepatitis Council</td>
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<tr>
<td>2.00pm - 2.05pm</td>
<td>Annie Madden of the Australian Injecting and Illicit Drug Users League</td>
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<tr>
<td>2.05pm - 2.10pm</td>
<td>John Hornell of the Hepatitis Foundation of New Zealand</td>
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<td>2.10pm - 2.15pm</td>
<td>Tracey Jones of the Australasian Hepatology Associates</td>
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<td>2.15pm - 2.30pm</td>
<td>The Hon. Dr Michael Wooldridge, Chair of the Ministerial Advisory Committee on AIDS, Sexual Health and Hepatitis</td>
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<td>2.30pm - 3.00pm</td>
<td>Annie Madden, Executive Officer of the Australian Injecting and Illicit Drug Users League</td>
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<td>3.00pm - 3.30pm</td>
<td>Geoff Farrell, Robert W Storr Professor of Hepathic Medicine of the Storr Liver Unit at Westmead Hospital</td>
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<td>3.30pm - 4.00pm</td>
<td>Afternoon Tea in the Foyer</td>
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<td>4.00pm - 5.30pm</td>
<td>Plenary 1 - Advances in the Understanding of Chronic Viral Hepatitis</td>
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<td>Royal Theatre</td>
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<tr>
<td>4.00pm - 4.30pm</td>
<td>Michael Lai, Distinguished Professor of Molecular Microbiology and Immunology at The University of Southern California and the Vice President of Academia Sinica</td>
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<tr>
<td></td>
<td>Molecular Mechanisms of Pathogenesis of Hepatitis C Infection</td>
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<tr>
<td>4.30pm - 5.00pm</td>
<td>Michael Gale, Assistant Professor in the Department of Microbiology at the University of Texas Southwestern Medical Center</td>
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<td>HCV and Interferon Resistance, The Virus or the Host</td>
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<td>5.00pm - 5.30pm</td>
<td>Solko Schalm, Head of Hepatology at the Erasmus MC University Medical Center, Rotterdam, Netherlands</td>
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<td>5.30pm - 7.00pm</td>
<td>Welcome Drinks &amp; Exhibition Opening</td>
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### Wednesday 1 September 2004

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<td>7.30am</td>
<td>Registration</td>
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<tr>
<td>9.00am - 10.30am</td>
<td>Plenary - Improving Access to Hepatitis C Prevention, Treatment and Care</td>
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<td>Royal Theatre</td>
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<tr>
<td>9.00am - 9.30am</td>
<td>Charles Henderson, National Manager of the Needle Exchange Program, Christchurch, New Zealand</td>
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<td>Priorities for Prevention, Treatment and Care</td>
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<td>9.30am - 10.00am</td>
<td>Ingrid van Beek, Director of the Kirketon Road Centre</td>
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<td>Accessible Primary Care as a Foundation for Improved Health Outcomes</td>
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<td>10.00am - 10.30am</td>
<td>Diana Sylvestre, Assistant Clinical Professor in the Department of Medicine at the University of California, San Francisco, USA</td>
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<td>Treating Hepatitis C in Drug Injectors</td>
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<td>10.30am - 11.00am</td>
<td>Morning Tea in Exhibition &amp; Poster Area - Exhibition Hall</td>
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<tr>
<td>11.00am - 12.30pm</td>
<td>Symposium - Clinical Medicine - Hepatitis B: Individualising Patient Therapy</td>
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<td>Concurrent - Epidemiology &amp; Social Research - HCV in IDUs: Risk Behaviour, Transmission and Research Strategies</td>
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<td>Concurrent - Public Health &amp; Prevention - Public Health Burden and Responses</td>
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<td>Concurrent - Basic Science - Immunopathogenesis of Viral Hepatitis</td>
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<td>Royal Theatre                                                          Bradman Theatrette Menzies Theatrette Nicholls Theatrette Sutherland Theatrette</td>
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<td>12.30pm - 1.30pm</td>
<td>Lunch in the Exhibition &amp; Poster Area - Exhibition Hall</td>
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<tr>
<td>1.30pm - 3.00pm</td>
<td>Plenary - The Expanding Epidemic of Hepatitis C in Australia</td>
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<td>Royal Theatre</td>
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<tr>
<td>1.30pm - 2.00pm</td>
<td>Louisa Degenhardt, Lecturer at the National Drug and Alcohol Research Centre</td>
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<td>Epidemiology of injecting drug use in Australia</td>
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<tr>
<td>2.00pm - 2.30pm</td>
<td>Campbell Aitken, Senior Research Officer at the Burnet Institute</td>
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<td>Working with Social Networks will Advance Hepatitis C Epidemiology</td>
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<tr>
<td>2.30pm - 3.00pm</td>
<td>Matthew Law, Head of the Biostatistics and Databases Program at the National Centre in HIV Epidemiology and Clinical Research, University of NSW</td>
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<td>Trends in Long-term Sequelae of HCV Infection in Australia, 2005-2020</td>
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<td>3.00pm - 3.30pm</td>
<td>Afternoon Tea in the Exhibition &amp; Poster Area - Exhibition Hall</td>
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<td>3.30pm - 5.00pm</td>
<td>Symposium - Clinical Medicine - Improving Treatment Outcomes for People with Hepatitis C</td>
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<tr>
<td>7.00pm</td>
<td>Conference Dinner - Old Parliament House</td>
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<td>Registration</td>
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<td>10.30am</td>
<td><strong>Symposium - Basic Science</strong>&lt;br&gt;- HCV Protective Immunity&lt;br&gt;and Vaccine Development&lt;br&gt;Bradman Theatrette</td>
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<td>10.30am - 11.00am</td>
<td>Morning Tea in the Exhibition &amp; Poster Area - Exhibition Hall</td>
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<td>11.00am - 12.30am</td>
<td><strong>Plenary - Coinfection</strong>&lt;br&gt;Royal Theatre</td>
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<tr>
<td>11.00am - 11.30am</td>
<td>Sharon Lewin, Director of the Alfred Hospital Infectious Diseases Unit&lt;br&gt;Immunopathogenesis of Viral Hepatitis/HIV Co-infection</td>
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<tr>
<td>11.30am - 12.00pm</td>
<td>Greg Dore, Head of the Viral Hepatitis Program, National Centre in HIV Epidemiology and Clinical Research&lt;br&gt;Natural History of Viral Hepatitis/HIV Co-infection</td>
</tr>
<tr>
<td>12.00pm - 12.30pm</td>
<td>Joe Sasadeusz, Infectious Diseases Physician, Royal Melbourne Hospital&lt;br&gt;Therapeutic Advances in Viral Hepatitis/HIV Co-infection</td>
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<tr>
<td>12.30pm - 1.30pm</td>
<td>Lunch in the Exhibition &amp; Poster Area - Exhibition Hall</td>
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<td>1.30pm - 3.00pm</td>
<td><strong>Plenary - Marginalised Populations</strong>&lt;br&gt;Royal Theatre</td>
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<tr>
<td>1.30pm - 2.00pm</td>
<td>Chris Cunningham, Professor of Maori Health &amp; Director of the Research Centre for Maori Health &amp; Development, Massey University, Wellington, New Zealand&lt;br&gt;Maori Health and Hepatitis B</td>
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<tr>
<td>2.00pm - 2.30pm</td>
<td>Michael Doyle, Indigenous Projects Officer at the Hepatitis Council of Western Australia&lt;br&gt;The Hepatitis C Response Among Indigenous Australians</td>
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<td>2.30pm - 3.00pm</td>
<td>Andrew Lloyd, Head of the Inflammation Research Unit, School of Medical Sciences, University of NSW&lt;br&gt;Enhancing Hepatitis C Prevention, Treatment and Care in Prison Populations</td>
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<td>3.00pm - 3.30pm</td>
<td>Afternoon Tea in the Exhibition &amp; Poster Area - Exhibition Hall</td>
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<td>3.30pm - 5.00pm</td>
<td><strong>Closing Session</strong>&lt;br&gt;Royal Theatre</td>
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<tr>
<td>3.30pm - 4.00pm</td>
<td>Geoff McCaughan, Director of the AW Morrow/GE Liver Centre at Royal Prince Alfred Hospital, Sydney&lt;br&gt;Highlights from the conference program</td>
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<tr>
<td>4.00pm - 4.20pm</td>
<td>Lorraine Breust, Director of the Hepatitis C Section of the Department of Health and Ageing, Canberra&lt;br&gt;Strategic Directions for Australia’s Response to Hepatitis C</td>
</tr>
<tr>
<td>4.20pm - 4.50pm</td>
<td>Professor Robert Batey, Chair of the Hepatitis Sub-committee of the Ministerial Advisory Committee on AIDS, Sexual Health and Hepatitis; Are We Heading in the Right Direction in Australia?</td>
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<tr>
<td>4.50pm - 5.00pm</td>
<td>Greg Dore, Convenor of the 4th Australasian Hepatitis C Conference</td>
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Dr. Michael Gale Jr

Dr. Michael Gale Jr is an Assistant Professor in the Department of Microbiology at the University of Texas Southwestern Medical Center. As an undergraduate student at the University of Washington, he worked as a research assistant in the laboratory of Dr. Lawrence Corey, studying the virus-host interactions of Herpes simplex virus infection. After receiving his Bachelor of Science Degree in Zoology, Dr. Gale joined the research group of Dr. Edwards Clark and studied the viral immunology of HIV and SIV infection at the Washington Regional Primate Research Center in Seattle. He then joined the PhD program at the University of Washington School of Public Health and Community Medicine where he studied protein kinase signalling, cell cycle control and host-parasite, Trypanosoma brucei. Dr. Gale received his PhD in 1994 and joined the laboratory of Dr. Michael Katze at the University of Washington for post-doctoral training in virology and virus-host interactions of the interferon system. In 1999 Dr. Gale joined the faculty of University of Texas Southwestern as the Nancy C. and Jeffrey A. Marcus Endowed Scholar in Medical Research, where he teaches molecular virology and conducts research focused on understanding how RNA viruses control the host cell antiviral response to infection.

Dr. Michael Gale Jr
University of Texas Southwestern Medical Center
Department of Microbiology
6000 Harry Hines Boulevard, Na6. 308
Dallas, Texas, 75235-9048, USA
Michael.Gale@UTSouthwestern.edu

Professor Michael Lai

Professor Michael Lai is a world-renowned RNA virologist. His research interest spans coronavirus (which causes severe acute respiratory syndrome, SARS), hepatitis delta virus and hepatitis C virus. He has made many pioneering contributions to the understanding of replication and pathogenesis of these viruses. He has been on the editorial boards of numerous virological journals, and is a fellow of The American Academy of Microbiology and an academician of Academia Sinica in Taiwan. He currently holds the titles of Distinguished Professor of Molecular Microbiology and Immunology at The University of Southern California and the Vice President of Academia Sinica.

Professor Michael Lai
Academia Sinica
128, Academia Road Section 2
Nankang, Taipei 115, Taiwan
jhchang@gate.sinica.edu.tw

Professor Solko Schalm

Professor Solko Schalm received his medical degree from the University of Leiden, The Netherlands, and he subsequently completed speciality training in Internal Medicine at University Hospital, Leiden. From 1974 to 1975 he was a research fellow at the Gastro Intestinal unit in Mayo Clinic, Rochester, Minnesota. In 1976 he returned to the Netherlands (Rotterdam) and became consultant in Internal Medicine at the University Hospital, Rotterdam, before obtaining his current position as Head of Hepatology at the Erasmus MC University Medical Center Rotterdam. His interest is currently expanding to case management by Doctor on-line Consultation. A former board member of the European Association for the Study of the Liver (EASL) from 1985 to 1988, he was president of EASL in 2000. He is an honorary member of the Dutch Liver Patient Society.

Professor Solko Schalm
Erasmus MC University Medical Center
Erasmus MC Maag Dam En Leverziekten Kamer
Ca-326, Dr Molewaterplein 40 3015 GD
Rotterdam, Netherlands
m.hoagendoorn@erasasmusmc.nl
Dr Diana Sylvestre MD

Dr Diana Sylvestre MD is an assistant clinical professor in the Department of Medicine at the University of California, San Francisco. A graduate of Harvard Medical School, she received postgraduate medical training at Harvard’s Brigham and Women’s hospital in Boston and at the Sloan Kettering Institute in New York. Dr Sylvestre is the Executive Director and Founder of O.A.S.I.S (Organisation to Achieve Solutions in Substance-Abuse), a non-profit clinic providing medical care to patients with addictive diseases, and is leading a US researcher in the field of hepatitis C and addiction.

Dr Diana Sylvestre
University of California
2862 Telegraph Street
Oakland, California 94609 USA
dsylves@itsa.ucsf.edu
GENERAL INFORMATION
GENERAL INFORMATION

Disclaimer
All information disclosed in the Conference Program is correct at the time of printing. The Conference Secretariat reserve the right to alter the Conference Program in the event of unforeseen circumstances. All speakers were invited to contribute abstracts for inclusion in the Conference Handbook. Unfortunately, not all speakers were able to provide us with their abstracts at the time of printing. The Conference Secretariat accepts no responsibility for errors, misprints or other issues with abstracts contained in this Handbook.

Internet Café
Abbott Australasia is proud to be sponsoring the Internet Café located in the Exhibition Hall in their booth (number 1 - please refer to floorplan).

Messages
A message board will be located near the Conference Registration Desk in the main foyer. Please advise potential callers to contact The National Convention Centre, Canberra and ask for the Hepatitis C Conference Desk. No guarantee can be given to deliver your messages personally.

Mobile Phones/Beepers
As a courtesy to all delegates and speakers, please switch off, or set to silent, your mobile phones and beepers during all sessions.

Name Badges
For security purposes all attendees must wear their name badge at all times whilst in the Convention Centre. Entrance to the trade exhibition will be limited to badge holders only. If you misplace your name badge, please advise staff at the Registration Desk.

Personal Mail
The conference organisers do not accept responsibility for personal mail. Please have all mail sent to your accommodation address.

Poster Display
Posters will be displayed for the duration of the Conference in the Exhibition Hall, which also contains the exhibition booths and all the catering. Posters will be available for viewing at 5.30pm on Tuesday 31 August during Welcome Drinks until 3.30pm on Thursday 2 September. Poster boards will be numbered as indicated in the Poster Program Section of this handbook. Delegates are encouraged to visit all the poster displays during the coffee and lunch breaks and welcome drinks.

Registration Desk
All enquiries should be directed to the Registration Desk in the main foyer, open at the following times:
- Tuesday 31 August: 11.00am – 7.00pm
- Wednesday 1 September: 7.30am – 5.30pm
- Thursday 2 September: 7.30am – 5.30pm

Smoking
This conference has a no smoking policy.

Speaker Preparation Room
A speaker preparation room will be located in the Executive Room on the First Floor of the National Convention Centre. This room will be open at the following times:
- Tuesday 31 August: 9.00am – 5.00pm
- Wednesday 1 September: 7.30am – 5.30pm
- Thursday 2 September: 7.30am – 5.30pm

All speakers must take their presentation to the speaker preparation room a minimum of four hours prior to their presentation or the day before if presenting at a breakfast or morning session.
Trade Exhibition

The trade exhibition is situated in the Exhibition Hall of the National Convention Centre, which also contains the posters and all the catering.

The exhibition will be open during the following hours:

- Tuesday 31 August: 5.30pm – 7.00pm
- Wednesday 1 September: 8.30am – 3.30pm
- Thursday 2 September: 8.30am – 3.30pm

The trade exhibition and posters for the ASHM Conference will also be available for viewing on Thursday 2 September from 8.30am – 3.30pm.

Venue

The National Convention Centre will host all Plenary, Symposia and Concurrent Sessions in the Ground Floor theatrettes. The Boardroom accessed from the First Floor is available as a quiet room for delegates, particularly those with medical conditions and we request that it be used only for this purpose and not for ad hoc meetings.

The National Convention Centre, Canberra
31 Constitution Avenue
Canberra, ACT 2601, Australia
Phone: 02 6257 4905. Fax: 02 6257 6405
www.nationalconventioncentre.com.au
SOCIAL PROGRAM

Lunches and Tea Breaks
Lunches and tea breaks on each day will be catered in the Exhibition Hall among the trade exhibition and poster displays.

Welcome Reception
5.30pm – 7.00pm, Tuesday 31 August
Exhibition Hall, National Convention Centre, Canberra
Tickets: One ticket is included for registered delegates.
$44 for additional guests

Hepatitis C Conference Dinner
7.00pm, Wednesday 1 September
Old Parliament House, Canberra
Tickets: $88 for registered delegates
$110 for additional guests
Transfers will be provided to the Conference Dinner from the Convention Centre and returning to all Conference Hotels. Schedules will be posted on the Message Board at the conference.

Tickets to Social Functions
Tickets will be required for entry into the Conference Dinner. All tickets will be in the delegate registration envelope. If you would like to purchase tickets to these functions you may do so up until 4pm on Tuesday 31 August at the Registration Desk.
THE NATIONAL CONVENTION CENTRE, CANBERRA FLOOR PLANS

GROUND FLOOR

FIRST FLOOR

FLOOR PLAN KEY
A = Bradman Theatrette
B = Menzies Theatrette
C = Nicholls Theatrette
D = Sutherland Theatrette
## EXHIBITION BOOTH LISTING

<table>
<thead>
<tr>
<th>ORGANISATION</th>
<th>BOOTH NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbott Australasia</td>
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<tr>
<td>Gilead Sciences Pty Ltd</td>
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</tr>
<tr>
<td>National Centre in HIV Social Research</td>
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<td>Unitract</td>
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<td>Four Seasons Condoms</td>
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<td>Bristol-Myers Squibb</td>
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<td>Roche Products</td>
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<td>Australian Government Department of Health and Ageing</td>
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<td>Schering-Plough</td>
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<td>Australasian Society for HIV Medicine</td>
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<td>Hepatitis C Council of NSW</td>
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<tr>
<td>Australian Hepatitis Council</td>
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<td>Terumo</td>
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<tr>
<td>ALTANA Pharma</td>
<td>15</td>
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<tr>
<td>Australian Injecting and Illicit Drug Users League</td>
<td>22</td>
</tr>
</tbody>
</table>
Abbott Australasia (Booth 1)
Abbott Australasia is a world leader in HIV medicine and has been at the forefront of HIV research, treatment and diagnosis including the development of the world’s first test for HIV infection. Abbott’s Protease inhibitor Norvir (ritonavir) was released in 1996 and was part of the Protease inhibitor/HAART life-saving revolution. Their second Protease inhibitor Kaletra (launched 2002), has now established itself as a key component of successful HIV treatment. Abbott continues its commitment to all facets of HIV and hepatitis both locally and globally.

Contact
Melanie Martel
Product Manager
Captain Cook Drive
KURNELL NSW 2231
Tel: +61 2 9668 1720
Fax: +61 2 9668 9233
Email: melanie.martel@abbott.com

Australasian Society for HIV Medicine (Booth 10)
The Australasian Society for HIV Medicine is Australia’s peak organisation representing medical practitioners and health care providers in the HIV and viral hepatitis and related diseases sectors. The Society conducts an annual medical/scientific conference, produces a range of educational resources and training programs, including managing continuing medical education courses, and offers information services. ASHM also participates in policy development, the setting of standards in relation to best practice care, treatment and management, and provides advice to government and non-government agencies.

Contact
Australasian Society for HIV Medicine (ASHM)
LMB 5057
DARLINGHURST NSW 1300
Tel: +61 2 9368 2700
Fax: +61 2 9380 9528
Email: ashm@ashm.org.au
Web: www.ashm.org.au

ALTANA Pharma (Booth 15)
ALTANA Pharma AG is the pharmaceutical group of ALTANA AG, an international group with over 7,500 employees and more than 30 subsidiaries and holding participations in Europe, North - and South - America, Asia, Australia as well as in South Africa. The headquarters of the company, which was founded in 1873, are located in Konstanz, Germany.

The ALTANA Pharma group centres on innovative, prescription-only therapeutics with its core competence anchored in gastrointestinal, respiratory and heart diseases. ALTANA Pharma Australia was incorporated in January 2002 and commenced activities in April of the same year.

In Australia ALTANA Pharma market the following products:
- SOMAC (pantoprazole) – treatment of reflux and peptic ulcer (in partnership with Pfizer)
- Zeffix (lamivudine) – treatment of chronic Hepatitis B (in partnership with GSK)
- Mesasal (mesalazine) – treatment and maintenance of Inflammatory Bowel Disease (in partnership with GSK)

Contact
ALTANA Pharma
Level 2 - 71 Epping Road
NORTH RYDE NSW 2113
Tel: +61 2 9889 8007
Fax: +61 2 9889 8009
Web: www.altanapharma.com.au

Australian Government Department of Health and Ageing (Booth 8)
The Commonwealth Department of Health and Ageing is responsible for: implementing and monitoring the National Hepatitis C Strategy 1999 – 2004; facilitating policy formulation and secretariat support for national committees; administering funding to State and Territory governments and NGOs; developing and promoting national standards for best practice in health promotion, treatment and care for hepatitis C and commissioning research.

Contact
Ms Lorraine Breust
Director
Hepatitis C Section
Department of Health and Ageing
MDP 13, GPO Box 9848
CANBERRA ACT 2601
Tel: +61 2 6289 4023
Fax: +61 2 6289 8098
Email: lorraine.breust@health.gov.au
Australian Hepatitis Council (Booth 13)

The Australian Hepatitis Council is the peak organisation representing people with hepatitis C on a national basis. The vision of the Australian Hepatitis Council is that:

- All people with hepatitis C and other chronic viral hepatitis infections reach their potential
- Communities affected by hepatitis are valued and free from discrimination
- We work towards a society free from new infections of hepatitis C and other chronic viral hepatitis infections.

We do this through national leadership and representation; Advocacy and lobbying; Policy development and research; Capacity building of the sector and National coordination of the community-based response.

Contact
Jack Wallace
Executive Officer
Australian Hepatitis Council
PO Box 716, Woden, ACT, 2606
Tel: +61 2 6232 4257
Fax: +61 2 6232 4318
Email: jack@hepatitisaustralia.com
Web: www.hepatitisaustralia.com

Bristol-Myers Squibb (Booth 6)

Bristol-Myers Squibb Pharmaceuticals is an Australian division of one of the world’s leading healthcare companies, with a mission to extend and enhance human life. The company is a leading maker of innovative therapies for cardiovascular, metabolic and infectious diseases, central nervous system and dermatological disorders and cancer.

In Australia, Bristol-Myers Squibb markets VIDEX EC® (didanosine) and ZERIT® (stavudine) for the treatment of patients with HIV/AIDS. Bristol-Myers Squibb’s new protease inhibitor, Reyataz® (atazanavir sulfate) is currently available through a special access program.

Contact
Mark Manuele
Product Manager – HIV
Bristol-Myers Squibb Pharmaceuticals
556 Princes Highway
NOBLE PARK NORTH VIC 3174
Tel: (03) 9213 4074
Fax: (03) 9701 1526
Email: mark.manuele@bms.com

Four Seasons Condoms (Booth 5)

Four Seasons Condoms are a 100% Australian owned and operated brand with a prominent range of condoms and lubrication throughout the country. With over 17 years’ experience, Four Seasons were the first company in Australia to introduce the Larger Fitting condom size and a number of others, including the very special Glow N Dark condoms. Four Seasons promote a strong safe sex message, in particular to the 14 to 29 year old demographic and have some interesting information on their website www.condoms.com.au.

Contact
Daniel Jordan
Brand Manager
Australian Therapeutic Supplies Pty Ltd.
21 Spencer Street
FIVE DOCK NSW 2046
Tel: +61 2 9745 6144
Fax: +61 2 9745 6141
Mobile: 0425 282 856
Email: ats@condoms1.com
Gilead Sciences Pty Ltd (Booth 2)

Gilead is a bio-pharmaceutical company that discovers, develops and commercialises therapeutics to advance the care of patients suffering from life-threatening diseases worldwide. We focus our research and clinical programmes on anti-infectives, including anti-virals.

Our leading-edge products include Viread® (tenofovir disoproxil fumarate) and Emtriva® (emtricitabine) for HIV/AIDS, Hepsera® (adefovir dipivoxil) for chronic hepatitis B and AmBisome® (amphotericin B) for severe fungal infections.

Our focus is on supporting the need for simplified treatment regimens.

A fixed-dose combination of Viread and Emtriva has been developed and Gilead recently announced a collaboration with Bristol-Myers Squibb and Merck Sharp & Dohme to create a fixed-dose combination of three anti-HIV drugs - Viread, Emtriva and efavirenz - demonstrating a further commitment to helping simplify treatment.

We look forward to seeing you at the Gilead stand during the conference.

Contact
Mrs Kathy McDaid
Gilead Sciences Pty Ltd
41 Stamford Road
OAKLEIGH VIC 3166
Tel: +61 3 9563 0433
Fax: +61 3 9563 0170
Email: kmcdaid@gilead.com

Hepatitis C Council of NSW (Booth 12)

The Hepatitis C Council of NSW is a community-based, non-government organisation funded by NSW Health to provide information, support, referral, education, advocacy and prevention services for people in NSW affected by hepatitis C.

We strive to be representative of, supportive and accessible to people affected by hepatitis C. Working actively in partnership with other organisations and the affected communities, we work to bring about improvement in the quality of life, information, support and treatment for the affected communities and to prevent hepatitis C virus transmission.

The Hepatitis C Council of NSW is accredited by the Quality Improvement Council of Australia.

Contact
PO Box 432
DARLINGHURST NSW 1300 AUSTRALIA
Administration:
Tel: +61 2 9332 1853
Fax: +61 2 9332 1730
Email: hccnsw@hepatitisc.org.au
Web: www.hepatitisc.org.au

Hep C Helpline:
02 9332 1599 (Sydney callers)
1800 803 990 (Other NSW callers)

Prisons Hep C Helpline:
NSW prisoners use the free call system

National Centre in HIV Social Research (Booth 3)

The National Centre in HIV Social Research (NCHSR) conducts research, which describes and analyses the social understandings, meanings and practices of peoples, institutions and communities in relation to HIV, Hepatitis C and other communicable diseases. NCHSR was established in 1990 with funding from the Commonwealth government, and is located within the Faculty of Arts and Social Sciences at The University of New South Wales, Sydney. Information about NCHSR research and publications is available at http://nchsr.arts.unsw.edu.au

Contact
Maude Frances
Research Resource Manager
Level 2, Robert Webster Building
University of NSW
SYDNEY NSW 2052
Tel: +61 2 9385 6776
Fax: +61 2 9385 6455
Email: m.frances@unsw.edu.au
Roche Products (Booth 7)

Roche is one of the world’s leading research-oriented healthcare groups. For more than 100 years, Roche has been active in the discovery, development, manufacture and marketing of innovative healthcare solutions. Roche’s products and services address prevention, diagnosis and treatment of diseases, thus enhancing well-being and quality of life. A core therapeutic area of focus is virology and some of the innovative products developed by Roche include Fuzeon® (enfuvirtide) for HIV infection, Pegasys®RBV® (peginterferon alfa-2a + ribavirin) and Pegasys® (peginterferon alfa-2a) for hepatitis C. Our mission is to create, produce and market innovative solutions of high quality for unmet medical needs. We do this in a responsible and ethical manner and with a commitment to sustainable development respecting the needs of the individual, the society and the environment.

Contact
Lani McGuire
Pegasys Product Manager
Roche Products
Roche Products Pty Ltd
4–10 Inman Road
DEE WHY NSW 2099
Tel:  +61 2 9454 9027
Fax:  +61 2 9454 9284
Email:  lani.mcguire@Roche.com

Schering-Plough (Booth 9)

Schering-Plough is a global pharmaceutical company committed to discovering and bringing to market new therapies and treatment programs that can improve people’s health and save lives. The Company’s core product lines are in allergy/respiratory, anti-infective/anticancer, dermatologicals and cardiovasculars, with a growing animal health business, complemented by leading over-the-counter and personal care brands. Schering-Plough has established itself as a leader in biotechnology, with strong research positions in genomics and gene therapy. With headquarters in Kenilworth, New Jersey USA, Schering-Plough International markets its products in more than 125 markets throughout the world, maintains subsidiaries in some 40 nations and has manufacturing facilities in over 20 of these. The Company maintains rigorous cost controls and has delivered superior financial results for more than a decade, outperforming its peers and providing attractive returns to shareholders.

Contact
Ronda Fethers
Senior Product Manager
Schering Plough Pty Limited
Specially Healthcare
Locked Bag 5011
BAULKHAM HILLS NSW 2153
Tel:  +61 2 9852 7444
Email:  ronda.fethers@spcorp.com

Terumo (Booth 14)

Terumo is a research and development company, which is recognised worldwide for its leading-edge technology and the outstanding quality of its systems. The wide range of innovative products within the Angiographic and Interventional, Cardiovascular, Laboratory, Hospital and Transfusion Systems comply with the highest medical standards and consultancy contribute to the healthcare of people in more than 150 countries.

Every day, as healthcare professionals, you are working to ensure life and to contribute to the well being of your patients. Every day, Terumo Corporation provides you with quality clinical systems, means and solutions to keep life flowing.

Contact
Rasika Deheragoda
Product Manager
Terumo Corporation
Australian Branch
Level 4, Building B, 11 Talavera Road
MACQUARIE PARK NSW 2113
Tel:  +61 2 9878 5122
Fax:  +61 2 9878 5085
Unitract (Booth 4)

Unitract is an Australian listed company established to offer safety syringe products that can help prevent the transmission of bloodborne pathogens caused by unsafe injection practices. The Unitract Syringe technology, which this year won the prestigious Prize of the State of Geneva Award, incorporates Automatic and Controllable Needle Retraction and Independent Reuse Prevention features to help prevent the reuse of syringes and needlestick injuries. Unitract is now seeking to work with Government and Non-Government Organisations to help provide safety syringe products that can contribute towards harm minimisation efforts in Australia and around the world.

Contact
Adrian Searle
General Manager - Sales & Marketing
Unitract Ltd
Level 5 35 Clarence St
SYDNEY NSW 2000 Australia
Tel: +61 2 8346 6522
Fax: +61 2 8346 6511
Email: Adrian.searle@unitract.com
Web: www.unitract.com
FULL CONFERENCE PROGRAM
**TUESDAY 31 AUGUST 2004**

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<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>11.00am</td>
<td>Registration</td>
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<tr>
<td>1.30pm - 3.30pm</td>
<td>Opening Session &amp; Strategic Directions for an Expanding Epidemic</td>
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<td></td>
<td>Royal Theatre</td>
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<td></td>
<td>Chairs: Greg Dore &amp; Bill Sievert</td>
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<tr>
<td>1.30pm - 1.40pm</td>
<td>Welcome to the Land speaker - Don Bell</td>
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<tr>
<td>1.40pm - 1.50pm</td>
<td>Greg Dore, Convenor of the 4th Australasian Hepatitis C Conference</td>
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<tr>
<td>1.50pm - 1.55pm</td>
<td>Darrell Crawford of the Gastroenterological Society of Australia</td>
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<tr>
<td>1.55pm - 2.00pm</td>
<td>Jack Wallace of the Australian Hepatitis Council</td>
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<tr>
<td>2.00pm - 2.05pm</td>
<td>Annie Madden of the Australian Injecting and Illicit Drug Users League</td>
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<tr>
<td>2.05pm - 2.10pm</td>
<td>John Hornell of the Hepatitis Foundation of New Zealand</td>
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<tr>
<td>2.10pm - 2.15pm</td>
<td>Tracey Jones of the Australasian Hepatology Associates</td>
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<tr>
<td>2.15pm - 2.30pm</td>
<td>The Hon. Dr Michael Wooldridge, Chair of the Ministerial Advisory Committee on AIDS, Sexual Health and Hepatitis</td>
</tr>
<tr>
<td>2.30pm - 3.00pm</td>
<td>Annie Madden, Executive Officer of the Australian Injecting and Illicit Drug Users League</td>
</tr>
<tr>
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<td>Role of people who inject drugs in the response to Hepatitis C</td>
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<tr>
<td>3.00pm - 3.30pm</td>
<td>Geoff Farrell, Robert W Storr Professor of the Storr Liver Unit at Westmead Hospital</td>
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<td>15 years of Hepatitis C: lessons learnt and future directions for the Australian response</td>
</tr>
<tr>
<td>3.30pm - 4.00pm</td>
<td>Afternoon Tea in the Foyer</td>
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<tr>
<td>4.00pm - 5.30pm</td>
<td>Plenary 1 - Advances in the Understanding of Chronic Viral Hepatitis</td>
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<td>Royal Theatre</td>
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<td></td>
<td>Chairs: Michael Beard &amp; Stephen Locarnini</td>
</tr>
<tr>
<td>4.00pm - 4.30pm</td>
<td>Michael Lai, Distinguished Professor of Molecular Microbiology and Immunology at The University of Southern California and the Vice President of Academia Sinica</td>
</tr>
<tr>
<td></td>
<td>Molecular Mechanisms of Pathogenesis of Hepatitis C Infection</td>
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<tr>
<td>4.30pm - 5.00pm</td>
<td>Michael Gale, Assistant Professor in the Department of Microbiology at the University of Texas Southwestern Medical Center</td>
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<tr>
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<td>HCV and Interferon Resistance, The Virus or the Host</td>
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<tr>
<td>5.00pm - 5.30pm</td>
<td>Solko Schalm, Head of Hepatology at the Erasmus MC University Medical Center, Rotterdam, Netherlands</td>
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<td></td>
<td>New and Future Treatment of Chronic Hepatitis B</td>
</tr>
<tr>
<td>5.30pm - 7.00pm</td>
<td>Welcome Drinks &amp; Exhibition Opening</td>
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### Wednesday 1 September 2004

<table>
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<tr>
<td>7:30am</td>
<td>Registration</td>
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<tr>
<td>9:00am - 10:30am</td>
<td>Plenary - Improving Access to Hepatitis C Prevention, Treatment and Care for People Who Inject Drugs</td>
</tr>
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<td>Royal Theatre</td>
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<tr>
<td></td>
<td>Chairs: Jude Byrne &amp; Paul Haber</td>
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<tr>
<td>9:00am - 9:30am</td>
<td>Charles Henderson, National Manager of the Needle Exchange Program, Christchurch, New Zealand</td>
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<td>Priorities for Prevention, Treatment and Care</td>
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<tr>
<td>9:30am - 10:00am</td>
<td>Ingrid van Beek, Director of the Kirketon Road Centre</td>
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<td>Accessible Primary Care as a Foundation for Improved Health Outcomes</td>
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<tr>
<td>10:00am - 10:30am</td>
<td>Diana Sylvestre, Assistant Clinical Professor in the Department of Medicine at the University of California, San Francisco, USA</td>
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<td>Treating Hepatitis C in Drug Injectors</td>
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<tr>
<td>11:00am - 12:30pm</td>
<td>Symposium - Clinical Medicine - Hepatitis B: Individualising Patient Therapy</td>
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<td>Royal Theatre</td>
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<td></td>
<td>Chairs: Ed Gane &amp; Stephen Locamini Panel: Solko Schalm, Graham Cooksley, Angeline Bartholomeus, Joe Sasadeusz, Bill Sievert</td>
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<tr>
<td>11:00am - 12:30pm</td>
<td>Concurrent - Epidemiology &amp; Social Research - HCV in IDUs: Risk Behaviour, Transmission and Research Strategies</td>
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<td>Bradman Theatrette</td>
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<td>Chairs: Ingrid van Beek &amp; Mary O’Brien</td>
</tr>
<tr>
<td>11:00am - 12:30pm</td>
<td>Concurrent - Public Health &amp; Prevention - Public Health Burden and Responses</td>
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<tr>
<td></td>
<td>Menzies Theatrette</td>
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<tr>
<td></td>
<td>Chairs: John Kaldor &amp; Margaret Hellard</td>
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<tr>
<td>11:00am - 12:30pm</td>
<td>Concurrent - Community - Strategies, Approaches &amp; Models</td>
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<td></td>
<td>Nicholls Theatrette</td>
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<td></td>
<td>Chairs: Jack Wallace &amp; Sharon Caris</td>
</tr>
<tr>
<td>11:00am - 12:30pm</td>
<td>Concurrent - Basic Science - Immunopathogenesis of Viral Hepatitis</td>
</tr>
<tr>
<td></td>
<td>Sutherland Theatrette</td>
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<td></td>
<td>Chairs: Michael Gale &amp; Andrew Lloyd</td>
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</tbody>
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Morning Tea in Exhibition & Poster Area - Exhibition Hall
## Exclusive Table Content

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<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>11.00am - 11.15am</td>
<td>Schalm S - The LiverDoc System: A New Form of Consultative Academic Medicine for Hepatitis B &amp; C</td>
</tr>
<tr>
<td>11.00am - 11.15am</td>
<td>Middleton M - Trends in Hepatitis C Infection in Australia, 1999-2003</td>
</tr>
<tr>
<td>11.00am - 11.15am</td>
<td>Thein H - Health-Related Quality of Life in a Prisoner Population With and Without Chronic Hepatitis C in NSW, Australia</td>
</tr>
<tr>
<td>11.00am - 11.15am</td>
<td>Ward J - Increasing Access to Services in NSW for Aboriginal People at Risk of Contracting or Who Have Blood Borne Infections - A Comprehensive Consultancy in NSW</td>
</tr>
<tr>
<td>11.20am - 11.40am</td>
<td>Visvanathan K - TOLL Receptors</td>
</tr>
<tr>
<td>11.15am - 11.30am</td>
<td>Aitken C - The Molecular Epidemiology of Hepatitis C Virus in a Social Network of Injecting Drug Users</td>
</tr>
<tr>
<td>11.15am - 11.30am</td>
<td>Day C - The Impact of the Heroin Shortage upon Injecting Drug Use and Hepatitis C Infections in NSW</td>
</tr>
<tr>
<td>11.20am - 11.34am</td>
<td>Helbig K J - Expression of the CXCR3 Ligand, I-TAC By Hepatocytes in Chronic HCV, and its Correlation with Hepatic Inflammation</td>
</tr>
<tr>
<td>11.20am - 11.40am</td>
<td>Cooksley G - Role of Interferons in Chronic Hepatitis B</td>
</tr>
<tr>
<td>11.15am - 11.30am</td>
<td>Wiggins N - Hepatitis C and the Role of Drug User Organisations</td>
</tr>
<tr>
<td>11.30am - 12.00pm</td>
<td>Thein H - Hepatitis C Prevalence and Risk Behaviours Among High Risk Populations Attending Needle and Syringe Programs in Australia</td>
</tr>
<tr>
<td>11.45am - 12.00pm</td>
<td>Paterson K - A Health Promotion Approach to Hepatitis C</td>
</tr>
<tr>
<td>11.30am - 12.02pm</td>
<td>Hornell J - Preliminary Results of a Two-Year Chronic HBV Follow-Up Programme</td>
</tr>
<tr>
<td>11.45am - 12.00pm</td>
<td>Elek C - Tips, Tools and Techniques: A Practical Workshop for Hepatitis C Educators</td>
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<tr>
<td>11.45am - 12.02pm</td>
<td>Gaudieri S - Adaptation of Hepatitis C Virus to HLA-Restricted Responses in HLA Diverse Populations</td>
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<tr>
<td>12.00pm - 12.15pm</td>
<td>Bartholomeusz A - Development of Bioinformatics Programmes for Patient Management</td>
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<td>12.00pm - 12.15pm</td>
<td>Higgs P - Recruitment: Issues for the Involvement of Injecting Drug Users into Hepatitis C Research</td>
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<tr>
<td>12.02pm - 12.16pm</td>
<td>Jilbert AR - Resolution of Transient Hepadnavirus Infections is Accompanied By Histologic Evidence of Marked Hepatocyte Death and Liver Regeneration</td>
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<tr>
<td>12.00pm - 12.15pm</td>
<td>Thein H - Hepatitis C Prevalence and Risk Behaviours Among Young Injecting Drug Users</td>
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<tr>
<td>12.00pm - 12.15pm</td>
<td>Richmond J - Does Health Professionals’ Hepatitis C Knowledge and Attitudes Impact on the Care they Provide for People with Hepatitis C?</td>
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<tr>
<td>12.00pm - 12.15pm</td>
<td>Clements D - Celebrating Good Practice - Opportunities for Workplace Change</td>
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<tr>
<td>12.02pm - 12.16pm</td>
<td>Treloar C - An Innovative Model for Developing Research Capacity in the Hepatitis C Sector</td>
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<tr>
<td>12.02pm - 12.16pm</td>
<td>Lucas M - Analyses of Successful and Unsuccessful Immune Responses Against Hepatitis C Virus Using MHC Class II Te tramers for the Study of CD4+ T Cells</td>
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<tr>
<td>12.00pm - 12.15pm</td>
<td>Locarnini S - Hepatitis B Case Studies</td>
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<tr>
<td>12.00pm - 12.15pm</td>
<td>Watson B - Alcohol Consumption Patterns Amongst Hepatitis C Positive People Receiving Opioid Maintenance Treatment</td>
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<tr>
<td>12.00pm - 12.15pm</td>
<td>Hornell J - Preliminary Results of a Two-Year Chronic HBV Follow-Up Programme</td>
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<tr>
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<td>Jilbert AR - Resolution of Transient Hepadnavirus Infections is Accompanied By Histologic Evidence of Marked Hepatocyte Death and Liver Regeneration</td>
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<tr>
<td>1.30pm - 3.30pm</td>
<td>Lunch in the Exhibition &amp; Poster Area - Exhibition Hall</td>
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<tr>
<td>12.30pm - 1.30pm</td>
<td>Workshop - Addressing the Health Needs of People Affected with Hepatitis C: A forum for people Living with and Affected by Hepatitis C - Menzies Theatrette Chairs: Sharon Caris &amp; Kerry Paterson</td>
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<tr>
<td>1.30pm - 3.00pm</td>
<td>Plenary - The Expanding Epidemic of Hepatitis C in Australia</td>
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<td>Royal Theatre Chairs: Margaret Hellard &amp; Cheryl Brunton</td>
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<tr>
<td>1.30pm - 2.00pm</td>
<td>Louisa Degenhardt, Senior Lecturer at the National Drug and Alcohol Research Centre Epidemiology of injecting drug use in Australia</td>
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<td>2.00pm - 2.30pm</td>
<td>Campbell Aitken, Senior Research Officer at the Burnet Institute Working with Social Networks will Advance Hepatitis C Epidemiology</td>
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<tr>
<td>2.30pm - 3.00pm</td>
<td>Matthew Law, Head of the Biostatistics and Databases Program at the National Centre in HIV Epidemiology and Clinical Research, University of NSW Trends in Long-term Sequelae of HCV Infection in Australia, 2005-2020</td>
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<tr>
<td>3.00pm - 3.30pm</td>
<td>Afternoon Tea in the Exhibition &amp; Poster Area - Exhibition Hall</td>
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<tr>
<td>3.30pm - 5.00pm</td>
<td>Symposium - Clinical Medicine - Improving Treatment Outcomes for People with Hepatitis C</td>
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<td>Royal Theatre Chairs: Jacqui Richmond &amp; Graham McDonald</td>
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<td></td>
<td>Concurrent - Basic Science - Hepatitis B Virology</td>
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<td>Bradman Theatrette Chairs: Allison Jilbert &amp; Yvonne Gosart</td>
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<td></td>
<td>Concurrent - Epidemiology &amp; Social Research - Defining and Addressing Morbidity in Chronic Viral Hepatitis</td>
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<td>Menzies Theatrette Chairs: Bob Batey &amp; Mary O’Brien</td>
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<td>Concurrent - Community - Community Voices</td>
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<td>Nicholls Theatrette Chairs: Michael Doyle &amp; Nicki Bath</td>
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<td></td>
<td>Concurrent - Public Health &amp; Prevention - Lessons Learnt from Public Health Interventions</td>
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<td>Sutherland Theatrette Chairs: Cheryl Brunton &amp; Michael Levy</td>
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<td>3.30pm - 3.50pm</td>
<td>Sylvestre D - Assessment &amp; Management of Depression in the Setting of Comorbid Addictive Disorders</td>
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<tr>
<td>3.30pm - 3.45pm</td>
<td>McKay R - Interactions Between Hepatitis B and Hepatitis C Virus in a Human Hepatoma Cell Line (HUH-7)</td>
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<tr>
<td>3.30pm - 3.45pm</td>
<td>Amin J - Hepatitis B and C and Liver Cancer in New South Wales 1990-2002: A Linkage Study</td>
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<tr>
<td>3.30pm - 3.45pm</td>
<td>Harvey EF - Hang' In: A Peer Education Model for Young Indigenous Drug Users by Young Indigenous Drug Users</td>
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<tr>
<td>3.50pm - 4.05pm</td>
<td>Totten L - Shared Care: What Makes it Successful</td>
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<tr>
<td>3.45pm - 4.00pm</td>
<td>Ayres A - Characterisation of Lamivudine Resistant Hepatitis B Virus (HBV) Mutations in HIV and HBV Co-Infected Individuals</td>
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<tr>
<td>3.45pm - 4.00pm</td>
<td>Zou J - Mother to Infant Hepatitis C Virus Transmission</td>
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<td>3.45pm - 4.00pm</td>
<td>Wickenheiser C - Building Blocks, Building Capacity: Working Together Towards Youth-Driven HCV Programs</td>
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<tr>
<td>4.05pm - 4.20pm</td>
<td>Douglas J - Provision of Care to Hepatitis C Positive Inmates in NSW Correctional Centres</td>
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<tr>
<td>4.00pm - 4.15pm</td>
<td>Bartholomeusz A - Molecular Modelling of Hepatitis B Virus Polymerase: Characterisation of Adefovir Resistance</td>
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<tr>
<td>4.00pm - 4.15pm</td>
<td>Tawk H - The Prevalence of Hepatitis B in 2120 Patients Undergoing Endoscopy in an Australian Hospital and their Risk Factors for Infection</td>
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<tr>
<td>4.00pm - 4.15pm</td>
<td>Jewell S - Testing and Diagnosis: Infecting Drug Users Experience Compared to National Policy</td>
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<tr>
<td>4.20pm - 4.35pm</td>
<td>Morrison J - Developing the Capacity of the Aboriginal Health Sector to Deal with the Expanding Epidemic of Hepatitis C</td>
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<tr>
<td>4.30pm - 4.45pm</td>
<td>Waller LJ - Is It My Hep C?</td>
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<tr>
<td>4.30pm - 4.45pm</td>
<td>Pritchard-Jones J &amp; Gray D - Developing the Second Area Health Plan - Identifying the Needs and Getting Commitment from a Range of Services</td>
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<tr>
<td>4.45pm - 5.00pm</td>
<td>Vickery K - The Therapeutic Use of a DNA Vaccine Containing T-Cell Epitopes of Duck Hepatitis B Virus (DHBV)</td>
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<tr>
<td>4.45pm - 5.00pm</td>
<td>Macdonald G - General Practitioner HCV Training Needs Survey: A Summary of Results</td>
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<tr>
<td>4.45pm - 5.00pm</td>
<td>Clarke KC - Community Participation in the Media</td>
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<tr>
<td>5.00pm</td>
<td>Close</td>
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<tr>
<td>7.00pm</td>
<td>Conference Dinner - Old Parliament House</td>
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## THURSDAY 2 SEPTEMBER 2004 FULL CONFERENCE PROGRAM

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<td>7.30am</td>
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<tr>
<td>9.00am</td>
<td><strong>Symposium - Basic Science - HCV</strong>&lt;br&gt;Chairs: Rosemary Ffrench &amp; Ian Ramshaw</td>
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<tr>
<td>9.00am</td>
<td><strong>Concurrent - Epidemiology &amp; Social Research - Understanding Hepatitis C</strong>&lt;br&gt;Chairs: Stuart Loveday &amp; Max Hopwood</td>
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<tr>
<td>9.00am</td>
<td><strong>Concurrent - Clinical Medicine - Clinical Outcomes in Hepatitis B &amp; C</strong>&lt;br&gt;Chairs: Geoffrey Farrell &amp; Ed Gane</td>
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<tr>
<td>9.00am</td>
<td><strong>Symposium Public Health: Towards the control of Hepatitis B</strong>&lt;br&gt;Chairs: John Hornell &amp; Cindy Shannon</td>
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<tr>
<td>9.00am</td>
<td><strong>Lloyd A - Immunity against Hepatitis C in Highly Exposed Populations</strong></td>
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<td>9.15am</td>
<td><strong>Richmond J - What are the Hepatitis C Knowledge and Attitudes of People with Hepatitis C</strong></td>
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<td>9.15am</td>
<td><strong>McCaughan Geoffrey - Surgical Resection Versus Transplantation in the Treatment of Hepatocellular Carcinoma</strong></td>
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<tr>
<td>9.20am</td>
<td><strong>Bullen C - The New Zealand Hepatitis B Screening Programme: Screening Coverage, Findings and Key Learnings</strong></td>
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<tr>
<td>9.20am</td>
<td><strong>Eric Gowans: Dendritic cell vaccination strategies for HCV</strong></td>
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<tr>
<td>9.30am</td>
<td><strong>Nguyen O - So What’s the Big Deal Anyway? How Do We Make Hepatitis C a Priority Among Ethnic-Vietnamese Injectors</strong></td>
</tr>
<tr>
<td>9.30am</td>
<td><strong>Matthews G - Improvement in Treatment Outcomes Amongst HIV/HCV Coinfected Individuals Treated Within a Tertiary Hospital Clinic Since 2000</strong></td>
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<tr>
<td>9.35am</td>
<td><strong>Locarnini S - Prevalence of HBsAg Mutants and Impact of Hepatitis B Infant Immunisation in Four Pacific Island Countries</strong></td>
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<tr>
<td>9.40am</td>
<td><strong>Qiao M - Hepatitis C Virus-Like Particles as A Vaccine Candidate for Hepatitis C</strong></td>
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<td>9.45am</td>
<td><strong>Doab A - Hepatitis C Knowledge, Attitudes and Barriers to Treatment in Active Injecting Drug Users</strong></td>
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<tr>
<td>9.50am</td>
<td><strong>Thein H - The Taiwan Experience</strong></td>
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<td>9.50am</td>
<td><strong>Higgrave D - Regional Perspectives on Long Term Control of Hepatitis B Infection</strong></td>
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<tr>
<td>10.00am</td>
<td><strong>Jillbert A - DNA Vaccination Strategies for Hepatitis Viruses</strong></td>
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<tr>
<td>10.05am</td>
<td><strong>Thein H - The Impact of Interferon-Based Therapy on Neurocognitive Function and Health-Related Quality of Life in Chronic Hepatitis C</strong></td>
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<tr>
<td>10.20am</td>
<td><strong>Bowden S - Hepatitis C Virus Genotypes: Determination of Unusual Genotypes and Response to Therapy</strong></td>
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<tr>
<td>10.20am</td>
<td><strong>Martin L &amp; Cao W - Who is Calling? Analysis of 8 Years of Calls to a Hepatitis C Telephone Information and Support Line</strong></td>
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<tr>
<td>10.20am</td>
<td><strong>Questions &amp; discussion</strong></td>
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**Registration:**

- **Bradman Theatrette Chairs:** Rosemary Ffrench & Ian Ramshaw
- **Menzies Theatrette Chairs:** Stuart Loveday & Max Hopwood
- **Nicholls Theatrette Chairs:** Geoffrey Farrell & Ed Gane
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<tr>
<td>10.30am - 11.00am</td>
<td>Morning Tea in the Exhibition &amp; Poster Area - Exhibition Hall</td>
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<tr>
<td>11.00am - 12.30am</td>
<td><strong>Plenary - Coinfection</strong>&lt;br&gt; Royal Theatre&lt;br&gt; Chairs: Margaret Hellard &amp; Martyn French</td>
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<tr>
<td>11.00am - 11.30am</td>
<td>Sharon Lewin, Director of the Alfred Hospital Infectious Diseases Unit&lt;br&gt; Immunopathogenesis of Viral Hepatitis/HIV Co-infection</td>
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<tr>
<td>11.30am - 12.00pm</td>
<td>Greg Dore, Head of the Viral Hepatitis Program, National Centre in HIV Epidemiology and Clinical Research&lt;br&gt; Natural History of Viral Hepatitis/HIV Co-infection</td>
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<tr>
<td>12.00pm - 12.30pm</td>
<td>Joe Sasadeusz, Infectious Diseases Physician, Royal Melbourne Hospital&lt;br&gt; Therapeutic Advances in Viral Hepatitis/HIV Co-infection</td>
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<tr>
<td>12.30pm - 1.30pm</td>
<td>Lunch in the Exhibition &amp; Poster Area - Exhibition Hall</td>
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<tr>
<td>1.30pm - 3.00pm</td>
<td><strong>Plenary - Marginalised Populations</strong>&lt;br&gt; Royal Theatre&lt;br&gt; Chairs: Charles Henderson &amp; Michael Levy</td>
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<td>1.30pm - 2.00pm</td>
<td>Chris Cunningham, Professor of Maori Health &amp; Director of the Research Centre for Maori Health &amp; Development, Massey University, Wellington, New Zealand&lt;br&gt; Maori Health and Hepatitis B</td>
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<tr>
<td>2.00pm - 2.30pm</td>
<td>Michael Doyle, Indigenous Projects Officer at the Hepatitis Council of Western Australia&lt;br&gt; The Hepatitis C Response Among Indigenous Australians</td>
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<tr>
<td>1.30pm - 1.50pm</td>
<td>Gale M - Viral control of IRF3 Determines Host Permissiveness to HCV RNA Replication</td>
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<tr>
<td>1.50pm - 2.04pm</td>
<td>McCaughan Geoff W - Microarray Analysis of Intrahepatic Gene Expression at Different Stages of Chronic HCV Infection</td>
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<tr>
<td>2.04pm - 2.18pm</td>
<td>Vietheer PTK (TBI) - Development of Chimeric Hepatitis B Virus-Like Particles for the Delivery of Foreign Epitopes Derived from Hepatitis C Virus</td>
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<tr>
<td>2.18pm - 2.32pm</td>
<td>Drummer HE - Identification of a Hydrophobic Heptad Repeat in the Membrane-Proximal Region of HCV E2 Necessary for E1 and E2 Heterodimerization and Viral Entry</td>
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| 2.30pm - 2.46pm | Andrew Lloyd, Head of the Inflammation Research Unit, School of Medical Sciences, University of NSW  
Enhancing Hepatitis C Treatment and Care in Prison Populations  
Beard MR - Alcohol Metabolism Enhances HCV Replication in Vitro  
Gowans EJ - GBV-B Infection in the Marmoset; A Surrogate Model of HCV |
| 3.00pm - 3.30pm | Afternoon Tea in the Exhibition & Poster Area - Exhibition Hall          |
| 3.30pm - 4.00pm | Geoff McCaughan, Director of the AW Morrow/GE Liver Centre at Royal Prince Alfred Hospital, Sydney  
Highlights from the conference program                           |
| 4.00pm - 4.20pm | Lorraine Breust, Director of the Hepatitis C Section of the Department of Health and Ageing, Canberra  
Strategic Directions for Australia’s Response to Hepatitis C       |
| 4.20pm - 4.50pm | Professor Robert Batey, Chair of the Hepatitis Sub-committee of the Ministerial Advisory Committee on AIDS, Sexual Health and Hepatitis  
Are We Heading in the Right Direction in Australia?               |
| 4.50pm - 5.00pm | Greg Dore, Convenor of the 4th Australasian Hepatitis C Conference       |
| 5.00pm        | Close                                                                   |
ORAL PRESENTATION ABSTRACTS
TUESDAY 31 AUGUST 2004
ROLE OF PEOPLE WHO INJECT DRUGS IN THE RESPONSE TO HEPATITIS C

Madden A1
1Australian Injecting & Illicit Drug Users League (AIVL), Canberra, ACT, Australia

In the context of a large and growing hepatitis C epidemic amongst people who inject drugs in Australia, this presentation will examine the critical role that injecting drug users themselves must play in all aspects of Australia’s response to the epidemic. In particular, the paper will look at the unique role of peer education in hepatitis C prevention and will outline some of the future peer education strategies that must be supported if we hope to gain control over the hepatitis C epidemic amongst IDU. The presentation will also look at a range of issues in relation to hepatitis C treatment and management for people who are current injectors. The paper will conclude by outlining the policy, legislative and service delivery issues that must be addressed if we want to engage drug users in relation to hepatitis C.
Plenary – Advances in the understanding of chronic viral hepatitis

MOLECULAR MECHANISM OF PATHOGENESIS OF HEPATITIS C VIRUS INFECTION

Lai M M C

1Academia Sinica, Taipei, Taiwan and Department of Molecular Microbiology and Immunology, Keck School of Medicine, University of Southern California, Los Angeles, California, USA

Hepatitis C virus (HCV) infection often persists, leading to chronic hepatitis, liver cirrhosis and hepatocellular carcinoma (HCC). In addition, HCV infection also causes B cell anomalies, including mixed cryoglobulinemia and non-Hodgkin’s B cell lymphoma. Thus, HCV is the only nonretroviral oncogenic RNA virus. The mechanisms of HCV persistence and its pathogenesis (hepatocyte damage) and oncogenesis (tumors) are not clear. Recently, we established a B-cell line persistently producing infectious HCV, enabling us to study the biology of HCV infection. We have found that HCV infection of B cells induces hypermutation of immunoglobulin (Ig) and other cellular genes (e.g., p53 gene). The increased mutation was a result of HCV-induced double-stranded DNA breaks. Two different mechanisms are responsible for DNA breaks; first, HCV core and NS3 proteins induce iNOS mRNA expression, resulting in increased NO production, which causes DNA breaks in somatic genes, such as p53. On the other hand, the hypermutation of Ig gene is caused by binding of E2 protein to CD81, the putative receptor for HCV. E2 binding induces double-stranded DNA breaks and upregulation of the expression of activation-induced cytidine deaminase (AID), which is the enzyme responsible for hypermutation of Ig in normal B cells. Thus, HCV used dual mechanisms to induce mutation of cellular DNAs. The enhanced double-stranded DNA breaks lead to enhanced chromosomal translocations or deletions. Furthermore, HCV infection interferes with the DNA repair mechanisms. The combination of these effects result in enhanced mutations of cellular genes and chromosomal anomalies. Correspondingly, the HCV-associated B-cell lymphoma or HCC showed a much higher frequency of amplified oncogene mutations than those of HBV-associated tumors or tumors of nonviral origin. Therefore, the mutator phenotype of HCV may explain the oncogenic potential of HCV. Furthermore, the enhanced mutation of Ig gene suggests that the antibody repertoire of HCV-infected patients will diverge quickly. This may explain the propensity of HCV infection to persist.

HCV AND INTERFERON RESISTANCE: THE VIRUS AND THE HOST

Michael Gale Jr.

1University of Texas Southwestern Medical Center, Dallas TX, U.S.A

Chronic infection with hepatitis C virus (HCV) is treated by administration of interferon alpha (IFN)-based therapy. Despite recent improvements in therapy protocols only about 50% of all treated patients clear the infection and exhibit a full and sustained response to therapy. Molecular studies have demonstrated that HCV encodes protein products that can antagonize the response to IFN and support IFN-resistant virus replication. HCV proteins direct strategies that include preventing interferon gene expression in infected cells, disrupting IFN receptor signaling processes and directly or indirectly altering the function of interferon-stimulated cellular target genes. Studies from cell culture systems and evaluation of infected patients have also revealed that the host response to HCV infection elicits a cytokine profile that may actually interfere with the actions of IFN therapy. Thus, the outcome of IFN therapy for chronic HCV infection is directed by both virus and host processes. Understanding the virus-host interactions that impart IFN action and influence the outcome of IFN therapy is essential for the refinement and improvement of therapy protocols. Improving IFN therapy for HCV infection will involve defining the interferon stimulated genes that actually suppress HCV replication, deriving IFN molecules of specific and increased potency, and developing therapy adjuncts that will potentiate IFN antiviral action.
NEW AND FUTURE TREATMENT OF CHRONIC HEPATITIS B

Schalm S W
Department of Hepatogastroenterology, ErasmusMC University Medical Center, Rotterdam, The Netherlands

Antiviral therapy is now effective in 90% of patients with active chronic hepatitis B. In 10% a complete response with HBsAg negativity is observed, in 30% a sustained virological response (HBeAg-negative and HBVDNA < 10^5 copies/ml), whereas in 50% a virological response (HBVDNA < 10^5 copies/ml) can be maintained with medication.

The major therapeutic goal for chronic hepatitis is conversion of active chronic hepatitis B to the inactive hepatitis B carrier state (persistent HBeAg-negativity, HBVDNA < 10^5 copies/ml and normal ALT). If these conditions are present 6-12 months after stopping treatment, a sustained response is assumed. Clinical benefit is also likely if low HBVDNA levels (< 10^5 copies/ml) and normal ALT levels are being maintained by antiviral therapy. The outcome measures for the treatment of cirrhosis are improvement in survival, decreased incidence of hepatocellular carcinoma and diminished need for transplantation.

Survival in compensated cirrhosis B is significantly improved by continuous lamivudine therapy, according to a placebo-controlled study in 651 patients from the Asian-Pacific region. In a 3-year period, the incidence of both liver failure and hepatocellular carcinoma decreased by 50%, from about 8% to 4%. Adefovir is a nucleotide-analogue with improved efficacy in suppressing wild-type HBV replication; it retains similar activity in case of lamivudine-resistant HBV. Adefovir has potential nephrotoxicity, but currently this appears to be a minor problem with the 10-mg dose and a dosing algorithm based on creatinin clearance. In view of the low rate of resistance (2% in 2 years) adefovir is now the drug of choice for decompensated cirrhosis type B and those with advanced compensated cirrhosis, characterized by elevated bilirubin, thrombocytopenia or low albumin.

For chronic hepatitis B without cirrhosis preference is given to interferon-based treatments of limited duration that can induce sustained virological response. In HBeAg-positive patients response rates (HBeAg loss) to peginterferon therapy varied by genotype: genotype A, 47%; genotype B, 44%; genotype C, 28%; and genotype D, 25%. In HBeAg-negative chronic hepatitis response rates were overall around 45%. More than 90 percent of patients completed 1 year of therapy, indicating excellent tolerance of the drug in chronic hepatitis B.
ORAL PRESENTATION ABSTRACTS
WEDNESDAY 1 SEPTEMBER 2004
PRIORITY FOR PREVENTION, TREATMENT AND CARE FOR PEOPLE WHO INJECT DRUGS

Henderson C1
1Needle Exchange Services Trust, Christchurch, New Zealand

The prevention of Hepatitis C requires a co-ordinated strategy, which is underpinned by the principles of the Ottawa Charter and shaped by the concepts of primary and secondary prevention, surveillance and research. Today, in New Zealand and other developed countries alike, the use of injecting drugs has become the single most important risk factor for acquiring Hepatitis C and accounts for around 90% of infections. Optimising NEP [or NSEP] will make a significant impact upon the rate of HCV, and other hepatitis, transmissions. Prevalence of this indolent virus can be reduced from its current endemic levels.

The IDU population consists of multiple sub-groups/ cultures, each has varying levels of incidence and understanding/ knowledge of these viruses, and risk factors apply differently in magnitude, types, and duration. Due to the illegal & covert nature of the activity, IDU are a relatively hidden population. IDU have unique medical needs as a result of being drug injectors; these include site infections, systemic infections, endocarditis and other secondary effects. Measured rates of sharing and re-use of injection equipment (primary BBV disease transmission vector) remain high and these can only be further reduced with concerted/ targeted educational efforts. The key to the control of Hepatitis C lies in prevention programmes focusing on those at risk of infection, and those who are already infected, to avoid further disease transmission.

Peers based services are the preferred method of service delivery by the target group [IDU]. Dedicated exchange activities then become the ‘frontline’ in the efforts to reduce the chronic disease burden of the Hepatitis viruses within affected individuals, and to the wider community in downstream health costs; eg co-infection of HBV & HCV doubles the risk of progression to liver cancer. Appropriate, well aimed education and peer outreach programs are desperately needed if the transmission of hepatitis C among young users of injectable drugs is to be kept to a minimum.

It is only through increased outputs of health education & promotion, coupled with IDU advocacy & empowerment, that the aims of disease prevention and health gain can be achieved, and these things require resources.

ACCESSIBLE PRIMARY CARE: A FOUNDATION FOR IMPROVED HEALTH OUTCOMES FOR PEOPLE WHO INJECT DRUGS

Van Beek I1
1Kirketon Road Centre, Kings Cross, NSW, Australia

People who inject drugs represent a significant population with hepatitis C virus (HCV) globally, however, it has been consistently reported that injecting drug users (IDUs) have less access to HCV treatment than non-IDUs with HCV. A large proportion of the IDU population have HCV but often have a range of health and social welfare needs beyond HCV. To maximise IDUs’ access to effective HCV treatments, wholeistic, primary health care models that are accessible, acceptable, affordable and equitable need to be developed.

It is well established that opioid agonist pharmacotherapies such as methadone maintenance treatment, improve the overall health and psychosocial stability among opioid-dependent IDUs. The integration of such pharmacotherapies into primary health care settings has the further advantage of also allowing the direct observation of the concomitant administration of HCV treatments. This increases HCV treatment adherence while also enabling the timely management of other clinical issues, particularly harmful side effects, should these arise.

Where feasible, sexual and reproductive health services and a focus on HIV and hepatitis B & C prevention should also be incorporated. Services should be anonymous and confidential, and be provided by a multidisciplinary team in a non-judgemental way. Involvement of the affected community in service planning should also be promoted to ensure the acceptability of the model to the target population.

The Kirketon Road Centre (KRC) in Kings Cross, Australia, is an example of a community-based “one stop shopping”service delivery model that comprehensively addresses the wide range of complex health and social welfare needs IDUs may have. Originally established to effect HIV prevention among IDUs, the KRC model has proven robust and versatile in being able to upscale to also meet HCV prevention and treatment and other emerging health needs of IDUs in a timely way. Primary health care models such as this should be promoted more widely as an appropriate foundation to improve the health outcomes of people who inject drugs.
TREATING HEPATITIS C IN DRUG INJECTORS

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Although the majority of prevalent and incident cases of hepatitis C (HCV) infection are associated with injection drug use, there are little data about hepatitis C (HCV) treatment outcomes in active substance users. Drug-using patients may have poor adherence to health care regimens, high rates of comorbid psychiatric disease, psychosocial instability, and poor health literacy. Drug use during treatment for HCV may additionally alter the pharmacokinetics and efficacy of prescribed medications, increase the risk of neutropenia-related infections, or lead to serious cytopenias and psychiatric instability. Although the importance of case-by-case determination of eligibility for treatment has more recently gained acceptance, the specific impact of these treatment barriers among drug users has not been quantified, leaving clinicians without the data they need to inform individualized treatment planning. This talk will present our current data on hepatitis C treatment in active injection drug users, specifically with regard to the impact of comorbid psychiatric illness, duration of abstinence, and intercurrent drug use. In addition, preliminary study reports on the use of pegylated interferon in this population and the use of buprenorphine to bridge active heroin users to hepatitis C treatment will be presented. Our studies of real-world patients with addictive disorders suggest that although response rates may be modestly lower than non-drug using populations, substance users can be successfully treated for HCV even in the setting of preexisting mental illness, limited abstinence, and intercurrent drug use. In addition, these results are beginning to answer some of the questions that arise when making decisions about treating HCV in these patients. First, they suggest that the duration of abstinence may be individualized. Second, they suggest that aggressive intervention to prevent a drug relapse from becoming regular may preserve treatment outcomes and eliminate the need to discontinue HCV treatment. Third, although comorbid psychiatric conditions may reduce HCV treatment response rates, addicted patients with a history of depression or other mental illness may be successfully treated as long as their condition is stabilized prior to initiating HCV treatment.
THE LIVERDOC SYSTEM: A NEW FORM OF CONSULTATIVE ACADEMIC MEDICINE FOR HEPATITIS B AND C

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Traditional academic medicine focuses on knowledge generation. It assumes adequate distribution of knowledge through journals, conferences and professional guidelines. In practice, results of antiviral therapy are significantly worse in community hospitals compared to academic centers; furthermore, only about 5% of chronic viral hepatitis patients receive antiviral therapy although effective control is possible in the majority of hepatitis B or C cases. LiverDoc has set-up a Doctor Online Consultation system in an attempt to develop a new form of academic medicine that is more effective in knowledge integration and distribution.

In this system patient consults a local physician (general practitioner or specialist); the physician diagnoses hepatitis and sends patient data on history, physical examination, laboratory tests and ultrasound, via safe internet connection, to the center of expertise. Within 24 hours, the center responds with information on diagnosis, prognosis, natural history, general management and treatment options, chances of treatment response and serious side effects. This information allows the physician to make medical management decisions together with the patient based on the best evidence. Monitoring and follow-up can also be done through the system.

The patient benefits from top-level case management delivered by the local physician without the need for the patient to travel to distant medical centers. The advantages for the doctor are increased confidence, reduced time spent on gathering patient specific information, and increased quality of care. Another advantage is that a patient database is created allowing research on disease course and management in normal medical practice conditions.

The system is highly secure and privacy robust; data entry is structured; the decision support system uses decision trees based on integration of professional guidelines (NIH, EASL, Cochrane) and results from randomized controlled trials. Further development includes utilization of data from the LiverDoc patient database and implementation of probabilistic networks.

Our system is developed with continuous user feedback including interviews, questionnaires and usability testing with a panel of potential users. We applied a phased development approach: rapid development of a prototype, its testing with potential users and modifying based on comments. During this conference we hope to get valuable feedback from you.
DEVELOPMENT OF BIOINFORMATICS PROGRAMS FOR PATIENT MANAGEMENT.

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The objective of a National Hepatitis B Bioinformatics System (NHBBS) is to provide comprehensive clinical and virological information on hepatitis B. The NHBBS will incorporate state-of-the-art computer software with data analysis and data mining capabilities. The aims of the NHBBS are to provide the following: (i) an internet-based antiviral drug-resistance and vaccine escape monitoring system for the clinical management of chronic hepatitis B (CH-B) and (ii) an integrated hepatitis B virus (HBV) database that includes clinical and virological parameters. The NHBBS program can also be used to determine the HBV genotype and to analyze other clinically important HBV mutations such as the basal core promoter mutations, pre-core stop codon mutations, vaccine escape mutations, or deletions in Pre-S by comparison to reference sequences from genotypes A-H. Mutations selected by antiviral agents may affect both the polymerase and envelope genes and may alter the immunogenicity and antigen/antibody binding capacity of the envelope protein. All sequence and mutations data from the analysis engine is stored in a database. This database will be linked to phenotype and clinical history data. The linking of these data will enable Artificial Intelligence programs to identify a virtual phenotype for therapeutic management. The NHBBS system is an important tool for individualized patient management and will be a useful guide to antiviral therapy as new agents and combinations thereof are introduced, and new HBV resistance mutations are identified. The use of NHBBS will deliver greater expertise in the detection of HBV strains that are resistant to existing hepatitis B therapies, thereby reducing treatment costs whilst maximizing therapeutic benefits. Cost savings may be realized through the following (i) more efficient and efficacious use of anti-HBV drugs, (ii) fewer adverse events, including drug-drug interactions and incorrect drug dosing, (iii) reducing the risk for selecting more drug-resistant HBV mutants (iv) standardization of HBV therapeutic management and (v) the accumulation of real-time clinical cause and effect data on a large population base of HBV-infected individuals.
TRENDS IN HEPATITIS C INFECTION IN AUSTRALIA, 1999-2003

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Hepatitis C is one of the most commonly notified communicable diseases in Australia. However, the annual number of cases notified nationally has been gradually declining since 2000, and anecdotal evidence suggests that there may have been a recent decline in incidence.

State and territory health jurisdictions report new diagnoses of hepatitis C to the National Notifiable Diseases Surveillance System (NNDSS). Cases of newly acquired hepatitis C are also reported by all jurisdictions except the Northern Territory and Queensland. However, the small numbers, and changes in surveillance make trends in newly acquired hepatitis C difficult to interpret. Therefore, trends in total hepatitis C notification rates in younger age groups may be a more reliable measure of changes in hepatitis C incidence. Hepatitis C notifications to NNDSS over the period 1999 to 2002 were examined, including trends in age group-based population rates.

The number of new diagnoses of hepatitis C peaked at 20,465 cases in 2000, at a rate of 107.5 per 100,000 population, then decreased to 15,963 in 2002, at a rate of 82.8 per 100,000 population (p < 0.0001). In 2002, notification rates ranged from 101.5 per 100,000 population in New South Wales to 42.2 per 100,000 population in South Australia. Hepatitis C is more frequently notified in men than in women with a male to female ratio of 1.6 in 2002. While the highest notification rate in 2002, 167.7 per 100,000 population, was found in those aged between 25-29, the difference between the rates for those aged between 20 and 39 was minimal. The notification rate in younger age groups decreased between 2000 and 2002 from 103.6 to 57.6 per 100,000 population for those aged 15-19 (p < 0.0001), from 229.4 to 161.7 per 100,000 for those aged 20-24 (p < 0.0001) and from 225.2 to 167.7 per 100,000 population for those aged 25-29 (p < 0.0001). Data from 2003 will also be available for presentation.

A decline in hepatitis C notifications of 26-45% among younger age groups occurred over the period 2000-2002. These trends suggest a declining incidence of hepatitis C in Australia, and assuming consistent patterns in testing could relate to declining prevalence of injecting drug use or improved harm reduction measures among people who inject drugs.

THE MOLECULAR EPIDEMIOLOGY OF HEPATITIS C VIRUS IN A SOCIAL NETWORK OF INJECTING DRUG USERS

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Molecular epidemiological techniques have brought a new dimension to the study of disease transmission and evolution. Epidemiology has also benefited from the introduction of social network analysis, which has generated new insights about HIV transmission and associated behaviour. We combined social network methods and molecular epidemiology to investigate the correspondence between the social networks of injecting drug users (IDUs) and patterns of related hepatitis C virus (HCV) infections. Our research was funded by the NHMRC (grant #111701).

After ten months of participant observation, a cohort of 199 IDUs was recruited from a local drug scene in Maribyrnong, Australia. Data were collected about IDUs’ egocentric behaviour and their relationships and injecting risk behaviour with others; venous or fingertip blood samples were taken from 198 participants. Social distances between IDUs were calculated, and molecular phylogenetic analysis of two regions of the HCV genome established relatedness of infections. The correspondence of the social and molecular distances between IDUs was investigated using regression analysis.

Of our 199 interviewed IDUs, 197 were members of one large connected component containing 577 dyadic injecting relationships. On average, participants nominated 4.6 network members (of whom 3.3 were interviewed), and were linked to 6.2 network members. Of 198 blood samples, 172 (86.9%) had detectable anti-HCV, and HCV RNA was detected in 138 (69.7%). Twenty-one blood samples (10.6%) contained neither HCV antibodies nor HCV RNA. Eighteen clusters of related infections involving 51 IDUs (37.0% of all IDUs) were detected, separable into 66 discrete pairs. Twelve IDU pairs with related infections (18.2%) reported injecting together previously; conversely, only 3.8% of pairs of HCV RNA-positive injecting partners had strong molecular evidence of related infections. Social and genetic distances separating IDUs were weakly related for genotypes 1b and 3a, and inversely related for 1a and 6a.

Static social network methods are likely to capture information about a minority of HCV transmission patterns, due to the difficulty of capturing historical infection pathways in an IDU social network. Nevertheless, molecular epidemiology identified clusters of related HCV infections in a significant minority of the study group.
The aim of this study was to assess evidence for hepatitis C virus (HCV) protective immunity through a comparison of incidence of initial HCV infection and HCV reinfection among a cohort of injecting drug users (IDU).

A retrospective study among IDU attending the Kirketon Road Centre (KRC), Kings Cross was undertaken to determine the incidence of initial HCV infection and HCV reinfection between July 1993 and March 2002. Entry criteria into the seronegative cohort were IDU attending KRC with at least one follow up antibody assessment. Initial HCV infection was defined as HCV antibody seroconversion. To determine the incidence of reinfection, persons with HCV clearance were identified from a cohort of seroconverters previously studied. Clearance was defined as at least one negative HCV-RNA following a positive RNA. Potential HCV reinfection was defined as a positive following at least one negative HCV-RNA within the HCV clearance group. Sequencing the 5'-UTR was employed to determine a change in genotype between positive HCV-RNA specimens either side of the negative HCV-RNA. The incidence of initial infection and reinfection was calculated using the person years method. The incidence rates and risk factors for initial infection and reinfection were compared using a Poisson random effects model.

The incidence of initial HCV infection among IDU was 17/100 person years (95% CI, 14 to 20/100 person years). The incidence of potential HCV reinfection was 42/100 person years (95% CI, 25 to 61/100 person years). For potential reinfection cases with a change in genotype between HCV-RNA positive specimens either side of the negative HCV-RNA, the incidence of probable reinfection was 24/100 person years (95% CI, 10 to 44/100 person years). Risk factors for potential HCV reinfection assessed (sex, sharing injecting equipment, history of incarceration, drug of preference, age at first injection and age at baseline) were non significant. The incidence rate for potential reinfection was significantly greater than initial HCV infection after adjustment for age at baseline (incidence rate ratio, 2.38). These results demonstrate no evidence of protective immunity among IDU who have apparently cleared HCV infection.

The objective of this study was to describe trends in hepatitis C prevalence and associated risk behaviours among potentially higher risk populations attending needle and syringe programs (NSP) in Australia.

Since 1995 annual cross-sectional surveys have been carried out at selected NSP sites to monitor human immunodeficiency virus (HIV) and hepatitis C virus (HCV) antibody prevalence and related risk behaviours among IDUs. Participants completed a brief self-administered, anonymous questionnaire and provided information on demographic characteristics, injecting and sexual behaviour in the past month, history of treatment for drug use, imprisonment in the previous year (recent imprisonment) and previous testing for HIV, HBV and HCV. HCV antibody was determined using capillary blood samples collected on blotting paper by finger prick with single-use lancets. Statistical analyses were restricted to the 1999 to 2003 surveys (n=2503, 2694, 2454, 2445 and 2495 respectively) among participants who reported Asian language spoken at home by parents, Indigenous origin, recent imprisonment and sex work in the month preceding survey.

The proportion of participants reporting Asian (based on language spoken at home by parents) and Indigenous origin increased annually from 1999 (1% and 7% respectively) to 2003 (6% and 8%). The proportion of participants reporting sex work decreased from 1999 (9%) to 2003 (7%). The proportion of participants reporting recent imprisonment remained stable at 16%. Median age at the time of survey and duration of drug injection increased in all groups between 1999 and 2003, whereas young and new injectors (less than 25 years and three years respectively), daily or more frequent injection and sharing decreased. Over the period, HCV prevalence was higher among all groups (Asian: 69%; Indigenous: 61%; recent imprisonment: 72%; sex work: 64%) compared to those without any of these characteristics (51%). HCV prevalence declined from 2001 to 2003 among Asian (77% to 63%) and recent imprisonment (74% to 70%) participants, however remained stable in Indigenous (61% to 63%) and sex work (70% to 72%) participants. During this period, HCV prevalence also declined among new injectors in all groups. HCV prevalence increased among Indigenous and sex work participants reporting daily or more frequent injection, however decreased among Asian participants. The differential hepatitis C prevalence in vulnerable populations suggests that targeted programs are needed to contain the HCV epidemic in Australia.
The objective of this study was to examine hepatitis C prevalence and associated risk behaviours among young injecting drug users (IDUs) attending Needle and Syringe Programs (NSP) in Australia.

Since 1995 annual cross-sectional surveys have been carried out at selected NSP sites to monitor human immunodeficiency virus (HIV) and hepatitis C virus (HCV) antibody prevalence and related risk behaviours among IDUs. Participants completed a brief self-administered, anonymous questionnaire and provided information on demographic characteristics, injecting and sexual behaviour in the past month, history of treatment for drug use, imprisonment in the previous year and previous testing for HIV, HBV and HCV. HCV antibody was determined using capillary blood samples collected on blotting paper by finger prick with single-use lancets. Statistical analyses were restricted to 2779 participants aged less than 25 years attending NSP core sites participating in all surveys between 1999 and 2003 and providing sufficient blood samples for HCV antibody testing.

During 1999 and 2003, the number of young IDUs participating in the survey decreased considerably from 706 to 361. There were more male (55% to 59%) than female (41% to 44%) participants each year. Median age at the time of survey and duration of drug injection respectively increased from 21 years and 4 years to 22 years and 5 years. The proportion of participants reporting less than three years of drug injection (34% to 20%), daily or more frequent injection (61% to 53%), re-use of someone else’s used needle and syringe (24% to 19%) decreased. The proportion of participants reporting imprisonment increased (14% to 18%), particularly among female participants (7% to 13%). HCV prevalence increased from 1999 (31%) to 2002 (45%), but decreased from 2002 to 2003 (45% to 38%). In the univariate analyses, female sex, older age group (20 to 24 years), Indigenous origin, non-English speaking background, longer duration of drug injection, heroin or poly drug injection, daily or more frequent injection, sharing, public injection, sex work, recent imprisonment and ever having tattoos were all significantly associated with HCV prevalence.

Results suggest that despite reductions in injecting risk behaviours among young IDUs, other factors need to be considered to control the epidemic. Additional multivariable logistic regression analyses will be performed to determine factors independently associated with HCV.
HEALTH-RELATED QUALITY OF LIFE IN A PRISONER POPULATION WITH AND WITHOUT CHRONIC HEPATITIS C IN NSW, AUSTRALIA

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The objectives of this study were to compare health-related quality of life (HRQOL) in a prisoner population with and without chronic hepatitis C, and to examine factors associated with HRQOL.

In 1996, the New South Wales (NSW) Corrections Health Service and Health Department conducted a cross-sectional health survey among a random sample of 789 inmates at 29 NSW corrections centres, stratified on the basis of age, sex, and Aboriginality. Information was collected on socio-demographic characteristics, history of institution, alcohol and illicit drug use and treatment, comorbidities, recent symptoms using a Symptom Check List, and any prescription medications taken. Hepatitis C virus (HCV) antibody and RNA status (in positive antibody subjects) was determined from venous blood sampling. HRQOL and mood status were assessed using the Short Form Health Survey (SF-36) and Beck Depression Inventory (BDI) and Beck Hopelessness Scale (BHS) respectively. Comparison of SF-36, BDI, and BHS scores between HCV Ab-/HCV RNA- (uninfected), HCV Ab+/HCV RNA- (exposed/cleared) and HCV Ab+/HCV RNA+ (viraemic) groups were made using ANCOVA and Student’s t tests and factors associated with HRQOL were performed using linear regression analyses.

Overall, there were 451 uninfected, 95 exposed/cleared, and 192 viraemic participants, with a mean (±SD) age of 35.1 (±13.7), 30.6 (±8.1) and 30.6 (±7.8) years respectively (p<0.001). Both exposed/cleared and viraemic groups scored significantly lower than the age- and sex-standardised Australian norms in mental health summary score (p<0.001), however, the age- and sex-adjusted SF-36 scores and BDI and BHS scores were similar between the exposed/cleared and viraemic groups. The SF-36 scores of each group were also similar to the uninfected group, adjusted for age, sex, and illicit drug use. Females had significantly lower SF-36 scores than males regardless of HCV status. Inmates who had knowledge of having hepatitis C had lower SF-36 scores than those who had no knowledge, regardless of HCV status. Among injecting drug users, SF-36 scores were also similar between the three groups. Any disabling condition, comorbidities, prescription medications taken in the past two weeks, systemic symptoms in the past four weeks, age, and BDI scores were significantly associated with HRQOL.

Results suggest that there was no evidence of greater HRQOL impairment among prison inmates with HCV viraemia. Factors other than HCV appear to be responsible for HRQOL impairment among prison inmates.
NOW, LATER OR NEVER: WHEN TO REFER A PATIENT WITH HEPATITIS C

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Over the past decade there have been significant improvements in treatment for hepatitis C. Despite this, less than 10% of people with hepatitis C have undertaken treatment. While there is good understanding of clinical factors that may enhance successful treatment, very little research has examined the broader social context of treatment. A clear picture of the inhibiting and facilitating factors influencing successful clinical treatment does not exist.

This paper is based on a 12-month study in Victoria, Australia, which surveyed general practitioners (GPs) (n=90), specialist physicians (n=57) and those with hepatitis C (n=227) about treatment issues. Focus group discussions were also held with general practitioners and people with hepatitis C. This paper reports both the understandings and practices of GPs and specialist physicians in relation to caring for people with hepatitis C. The three most common reasons for GPs to test patients for hepatitis C were a history of IV drug use, an elevated ALT level over a period of 6 months, and having a partner with hepatitis C. Specialists stated they would most like to receive a patient referral at the time of the patient’s hepatitis C diagnosis (58%); this matched closely with when most specialists received patients (59%). Specialist physicians considered it too late to receive referrals once a patient develops symptoms or when a patient develops signs of chronic liver disease.

GPs and specialist physicians were not consistent in their beliefs about what constitutes an appropriate referral for treatment. For example, 75% of specialists were happy to accept the referral of a patient who currently injects drugs, while only 51% of GPs were likely to refer a patient who is currently using to a specialist. A patient requesting a referral was rated highly (95%) by GPs as a reason to refer a patient, however only 28% of specialists stated that they would like to get a referral based on a patient’s request.

Results indicate the need for clear communication between GPs, specialist physicians and patients about the timing of referrals and the existence of treatment.

PRELIMINARY RESULTS OF A TWO-YEAR CHRONIC HBV FOLLOW-UP PROGRAMME

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By the conclusion of its component of the targeted hepatitis B screening programme in June 2002, the Hepatitis Foundation had commenced follow-up of 5,245 carriers. The follow-up programme includes persons identified in the 1999-2002 screening programme along with those enrolled from earlier, mostly pre-vaccination, screening programmes. By April 2004, the number actively enrolled had increased to 6002. The Foundation also follows up over 100 hepatitis C clients. The programme is coordinated by the Foundation’s staff in Whakatane, where the programme database is located, and where contact is maintained with clients and their nominated healthcare providers.

In the first seven quarters of the programme, 13,179 rounds of testing were carried out. Just over half (6,958) of these tests involved samples collected by our nurses and phlebotomists on home visits throughout the North Island. The average frequency of testing was 1.3 test rounds per client per annum. In the first year of the programme, 85% of enrolled clients received at least one set of tests. Based on the first three quarters of the current year, this compliance indicator is likely to reach 95%.

To date, the average prevalence of ALT elevation above 60IU/L on at least 3 consecutive tests is 16.7% of clients, with an average 2.3% showing AFP elevated above 25 ug/L. The aim of the programme is to ensure timely referrals for treatment. While this is certainly happening in numerous cases, assessment of the benefits of the programme in terms of improved outcomes for patients must await further experience.
An estimated 170 million people worldwide currently have hepatitis C. The increasing prevalence of hepatitis C makes it an important public health issue that affects many clinically and non-clinically based health professionals because they will be required to care for people with hepatitis C during their professional lives. An analytical, cross sectional survey was conducted to explore the complex inter-relationship between hepatitis C, knowledge, attitudes and health care. Surveys were distributed to 3382 complementary therapists, dentists, doctors, nurses, pharmacists and people with hepatitis C in Victoria, Australia. The overall response rate was 45% (n=1521). The results indicate that health professionals have an acceptable level of hepatitis C knowledge and reasonably compassionate attitudes about their attitudes toward infection control guidelines. Doctors were the only group where the majority (79%) knew hepatitis C is not commonly spread through sexual contact. While 45% of pharmacists and 38% of dentists incorrectly believed that hepatitis C could be spread through close personal contact such as kissing. Fifty-four percent of participants incorrectly believed that people with hepatitis C would die prematurely because of their hepatitis C, and 55% of health professionals were unaware that medicines are available to treat hepatitis C. Participants were asked about their attitudes toward infection control guidelines. The responses indicated a lack of understanding of the basic principles. Thirty percent of dentists believed that people with hepatitis C should be given the last appointment of the day. While 83% of doctors believed that patients with hepatitis C should be identified for occupational health and safety reasons, even though 82% believed following infection control guidelines prevented transmission of the virus. The purpose of exploring the knowledge and attitudes of health professionals is to provide a tangible base on which to build education strategies. Focusing education strategies on changing health professionals’ attitudes rather than relying solely on the transference of medical information may improve patient care.

On-site dosing clients were invited to complete the brief Alcohol Use Disorders Identification Test (AUDIT-C) with reference to the last six months. Responses were used to determine typical quantity and frequency of alcohol consumption and presence of episodic heavy drinking. Risk of adverse effects from alcohol was defined as drinking above NHMRC guidelines (risk of acute or chronic harm). For those reporting as HCV positive, the alcohol risk threshold for chronic harm was arbitrarily defined at half the NHMRC level.

The response rate was 79%. Of the 118 people registered for on-site dosing 93 agreed to participate. Of these 74% (n=69) reported they were HCV positive while 6% (n=6) did not know their HCV status. Overall 50% (n=46) of participants were drinking at risk levels, either as a result of episodic binging, or by exceeding the lower threshold for average daily consumption set for HCV infection. No participants were identified as drinking above general NHMRC recommended levels for chronic harm. Of the clients who reported as HCV positive, 50% of women and 55% of men consumed alcohol in excess of the stricter limits. Forty percent (n=37) of participants reported abstinence, and only 9% (n=8) reported alcohol use at non-risk levels.

These results suggest that binge drinking is a significant cause of acute risk in this population. The prevalence of regular hazardous drinking in this group is lower than reported in similar populations overseas and few drink without risk. Ongoing research will address the effects of episodic heavy drinking in the HCV positive population.
INCREASING ACCESS TO SERVICES IN NSW FOR ABORIGINAL PEOPLE AT RISK OF CONTRACTING OR WHO HAVE BLOOD BORNE INFECTIONS - A COMPREHENSIVE CONSULTANCY IN NSW

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The overall objective of a recent consultancy was to seek advice on, and summarise gaps in services recognised to date with respect to the specific needs of Aboriginal clients at risk of, or who have contracted Blood Borne Infections (BBIs) namely HIV, HCV and HBV. This presentation will focus on the findings in relation to HCV and highlight some of the findings and overall emerging picture of HCV and its impact on NSW Aboriginal communities. Gaps considered included the provision of culturally sensitive health and health related services to the client groups in question, accurate data collection relating to service provision, and the ethical collection, storage, use and dissemination of such data. Service provision covered the scope of education and prevention, health promotion, treatment and care. The aim once gaps were established was to develop proposed strategies intended to limit these service gaps.

Consultations were held across the state and were possibly the most comprehensive ever undertaken in NSW for a project of this type. In all, more than 500 stakeholders were interviewed across 18 AHSs (including Corrections Health), 32 Aboriginal Community Controlled Health Services (ACCHSs) and other Aboriginal health related services, and a dozen other agencies.

The findings of this project will be presented along with overarching strategic directions and recommendations as a result of this consultancy. An urgent response is required to address the increasing rates of HCV within Aboriginal communities.

HEPATITIS C AND THE ROLE OF DRUG USER ORGANISATIONS

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Peer Based Drug User Groups have played a significant and essential role in the successes achieved as part of the first National Hepatitis C Strategy. The review of this strategy highlighted a number of actions areas, all of which Drug User organisations have a role to play and can continue and improve on these past successes. Creating enabling environments and involving affected communities is only one of numerous shared philosophies that underpin both the aims of Drug User Orgs and the National Strategy. Effective and timely responses of peer organisations are only inhibited by resources and funding.

Peer education as delivered by Drug User Organisations has the ability, the necessary expertise and in some cases are the only community organisations that can address certain priority action areas identified in the review. Drug Users groups have a significant role to play in all of the four main priority areas for action. This role is one in which much experience has been gained in other health promotion areas relating to injecting drug users. Recognition of the role of Drug User Groups is essential for equitable resource allocation to be made in accordance with input and outcomes.

This presentation will look at the First strategy and its review and will explore the role of drug user groups in working towards achieving the identified aims.
The ‘hepatitis C workforce’, broadly defined, is a diverse and busy group, and includes nurses, youth workers, AOD and Needle and Syringe program workers, GPs and many others. These workers are often asked to ‘take on’ hepatitis C in addition to their existing workload. In this context, educating the workforce presents a range of challenges. At the Hepatitis C Council of NSW, we have developed a number of strategies designed to overcome these challenges and engage workers in hepatitis C education.

The Hepatitis C Council has been running hepatitis C workshops, training and ‘in-services’ for over decade; work which has increased since the inception of its Education and Development Team in 2001. The Council’s Education and Development Team aims to foster a knowledgeable, collaborative and well resourced hepatitis C workforce which addresses access, equity and prevention, and which works in partnership with affected communities. Our educational strategies are one way in which we achieve outcomes in these areas.

In this workshop we will discuss and demonstrate some techniques, strategies and resources which we have found useful in facilitating learning about hepatitis C. We will draw from adult education theories and processes, as well as from our experiences and participants’ experiences.

For the Australian Hepatitis Council, the development of a health promotion strategy represents a shift in direction away from the focus on information resource provision to a much broader concept of the agenda that must be addressed in responding to the challenges of hepatitis C.

In early 2003, the Australian Hepatitis Council held consultations with Hepatitis Councils and local hepatitis C service providers in Western Australia, South Australia, Queensland, New South Wales, Victoria and Tasmania to guide the development of the organisation’s Hepatitis C Health Promotion Strategy 2003-2005.

The consultations used the Ottawa Charter for Health Promotion as a theoretical framework for participants to view their work in the hepatitis C sector. Key issues raised by the consultation participants are presented within the five action areas of the Ottawa Charter: Build healthy public policy; Create supportive environments; Strengthen community action; Develop personal skills; Re-orient health services. These action areas were then used to frame the program of activities for the Australian Hepatitis Council for the duration of the strategy.
AN INNOVATIVE MODEL FOR DEVELOPING RESEARCH CAPACITY IN THE HEPATITIS C SECTOR

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Hepatitis C is an under-resourced research field. Successful collaborations between researchers, service deliverers, policy makers and community are required to optimise the resources available. However, effective collaborations are hampered by numerous factors including lack of research training for non-researchers, and different approaches, languages, priorities and outcomes of the groups involved.

A Consortium of academic and community organisations was successful in obtaining funds from NSW Health with the primary purpose of building and strengthening research capacity at the intersection between academic and health service organisations in the areas of hepatitis C, illicit drug use and HIV. The activities of this consortium will aim to encourage collaborative research and the formation of healthy public policy in these fields.

The activities of the Consortium involve providing opportunities for formal research training for candidates working in service delivery or community sectors as well as other activities to build reflexive practices in research and policy development.

To date, the Consortium has enrolled seven higher research degree candidates, begun a workshop program, established processes for development of an on-line policy clearing-house and a program of fellowship/internship opportunities for community sector workers. This paper will outline the structure and operations of the Consortium highlighting the achievements to date and the planned activities for the remainder of the program (which runs until 2006).

CELEBRATING GOOD PRACTICE – OPPORTUNITIES FOR WORKPLACE CHANGE

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The existence of a skilled and knowledgeable health and community service workforce is vital to efforts to appropriately engage people with hepatitis C and in turn reduce incidence rates. Staff in these settings require relevant, up to date information on hepatitis C and clear guidance in dealing with the often complex issues surrounding the illness. State-based Hepatitis C Councils are ideally placed to influence positive changes to hepatitis C practice in the health and community sectors.

In October 2003, the Hepatitis C Council of Victoria commenced a 12-month project funded to reduce discrimination experienced by people with hepatitis C when accessing health care services. This Workforce Development Initiative operated across one metropolitan and one regional Department of Human Services (Victoria) defined regions. It aimed to provide opportunities for health and community workers and their organisations to update existing knowledge regarding hepatitis C practice and implement appropriate workplace change strategies in order to prevent, identify and respond appropriately to hepatitis C-related discrimination.

This presentation will outline the project methodology and outcomes and, offer suggestions for ways health and community organisations can move forward in relation to implementing pertinent workplace change that will improve access for people with hepatitis C.
INNATE IMMUNITY AND VIRAL INFECTION

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The receptors of the innate immune system, including the TLRs, that are encoded in the germ line differ from antigen receptors in a number of important ways. They are expressed on many different antigen presenting cells, (monocytes/macrophages, dendritic cells (DC), B lymphocytes), the expression of these pattern recognition receptors is not clonal in nature and once the receptor has identified its ligand, the effector cells produce their effector functions immediately rather than after they have proliferated. This is an important factor in the rapidity of the innate immune response. The expression of Toll-like receptors (TLRs) and the signalling pathways that they control is increasingly being recognised as a central component of the innate immune response to all types of pathogens. At least 10 different human TLRs have been described so far. Details of the gene structure, transcriptional regulation and interactions of a few are known, in particular TLR2 and TLR4. Although TLRs are believed to play a protective role against host infections there have been examples where activation of these innate receptors contributes to disease. TLR4 has recently been demonstrated to play an important role in the pathogenesis of a viral infection, Respiratory Syncitial Virus infection in mice TLR signalling consists of at least two distinct pathways: a MyD88-dependent pathway that leads to the production of inflammatory cytokines, and a MyD88-independent pathway associated with the stimulation of IFN-beta and the maturation of dendritic cells. The MyD88-dependent pathway is common to all TLRs. Upon activation by microbial antigens, TLRs induce the recruitment of MyD88 via their TIR domain, which activates IRAK1 by phosphorylation. IRAK1 then leaves the MyD88-TLR complex and associates temporarily with TRAF6. This association elicits downstream signalling, leading to the activation of NFkB, which in turn induces the production of pro-inflammatory cytokines such as TNF-alpha, IL-1 and IL-12.

EXPRESSION OF THE CXCR3 LIGAND, I-TAC BY HEPATOCYTES IN CHRONIC HCV, AND IT’S CORRELATION WITH HEPATIC INFLAMMATION

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The majority of T cells in the chronic hepatitis C virus (HCV) infected liver express the CXCR3 receptor. Interferon-inducible T cell alpha chemoattractant (I-TAC) is a relatively new member of the CXCR3 ligand family, and as such its role has not been well documented in HCV infection. Previous microarray studies by our laboratory have revealed increased I-TAC expression in chronic hepatitis C and the aim of this study was to investigate if I-TAC plays a role in HCV related liver disease and to determine the cell population(s) within the liver responsible for I-TAC expression.

I-TAC mRNA levels in HCV infected liver were determined using real-time PCR and cellular localisation studies performed using immunohistochemistry. In vitro expression of I-TAC was investigated by treatment of either Huh-7 cells or Huh-7 cells harbouring the sub-genomic or genomic HCV replicons with either IFN-α, γ and TNF-α and measurement of I-TAC was monitored by ELISA.

I-TAC mRNA levels were markedly increased in HCV infected liver (12/12) compared to normal liver and non-viral hepatitis liver biopsies (fold increase range of 3.1 to 58.5). Immunohistochemical analysis revealed I-TAC expression predominantly localised to hepatocytes and sinusoidal epithelial cells, with active areas of inflammation showing the highest concentration of I-TAC and the relative magnitude of I-TAC mRNA levels was significantly associated with both lobular and portal inflammation scores (p = .027 and p = 0.013 respectively). In vitro I-TAC induction in Huh-7 cells was greatest using IFN-γ and TNF-α was found to synergistically increase I-TAC expression as determined by ELISA, which was further enhanced in the presence of HCV replication.

These results suggest that I-TAC, one of the most potent chemoattractants for activated memory T cells is produced by hepatocytes and plays an important role in T cell recruitment in the HCV infected liver and may be important in the pathogenesis of chronic hepatitis C. Furthermore, TNF-α acts synergistically with IFN-γ to increase I-TAC production in vitro that was further enhanced by HCV replication. These results suggest that HCV can modulate I-TAC expression and possibly other chemokines in response to stimulation with IFN-γ and TNF-α.
HEPATITIS C VIRUS SPECIFIC T CELL EFFECTORS IN THE BLOOD AND LIVER OF PATIENTS WITH CHRONIC HCV INFECTION PREFERENTIALLY EXPRESS THE CHEMOKINE RECEPTOR CXCR6

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We have previously reported that T cells in the liver of patients with chronic hepatitis C virus (HCV) infection predominantly express the chemokine receptors CXCR3, CCR5, and CXCR6. The expression of these chemokine receptors is perhaps indicative of highly differentiated T cells with potent effector function. The aim of this study was to examine the relationship between the chemokine receptor phenotype of liver infiltrating T lymphocytes and their anti-viral effector function.

Blood and paired liver samples were collected from patients with chronic HCV infection. Peripheral blood mononuclear cells (PBMC) and liver infiltrating mononuclear cells (LIMC) were isolated and stimulated with HCV derived antigens and/or peptides. The anti-viral responses of CXCR6+ T cells were detected, either, by IFN-γ ELISPOT, using CXCR6 enriched or depleted PBMC populations; or by flow cytometry using cytokine secretion or proliferation assays. Co-staining with phenotype and anti-chemokine receptor antibodies allowed responding cell populations to be identified. The expression of the CXCR6 ligand, CXCL16, in the liver was examined by RT-PCR and immunohistochemistry.

In the ELISPOT assay IFN-γ responses above background, in response to HCV antigen stimulation, were only detected in PBMC populations enriched for CXCR6+ T cells. The phenotype of IFN-γ producing cells was confirmed by flow cytometry where 95.6% of IFN-γ secreting CD4 T cells were CXCR6+. The expression of CXCL16 was detected in HCV infected liver samples by RT-PCR and immunohistochemistry. The cellular source was neutrophils.

The characterisation of the phenotypic features of virus-specific T cells during chronic infections, particularly with non-cytopathic viruses like HCV, will provide important insights into the link between T cell recruitment and pathogenesis. As such, the results reported here are the first to demonstrate a correlation between the migratory phenotype of liver infiltrating T cells and virus-specific T cell responses in individuals with chronic HCV infection.

ADAPTATION OF HEPATITIS C VIRUS TO HLA-RESTRICTED RESPONSES IN HLA DIVERSE POPULATIONS

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This study uses a novel population-based approach previously used to characterise HIV adaptation to the host immune response to examine a model of Hepatitis C Virus (HCV) evolution in-vivo, in which Human Leucocyte Antigen (HLA)-restricted HCV-specific cellular immune responses are fundamental to driving and shaping viral adaptation. We suggest that within functional constraints of the viral proteins, viral mutations that allow escape from HLA-restricted immune responses are selected within individual hosts (viral adaptation to individuals), and this selection during viral passage through a population of hosts determines the wildtype or consensus (primordial adaptation) viral sequence in a (host) population. Furthermore, viral adaptation to HLA-restricted responses can, to a large extent, account for the sequence diversity observed in viral sequences at the population level. This population-based approach will be used to characterise the in-vivo selection pressures exerted at single amino acids within the entire HCV by individual HLA alleles observed in the host population. Host HLA may in turn determine several aspects of HCV disease in an individual, including infection outcome, viral load, pathogenesis, response to drug therapy and HCV vaccination.

Here we examine HCV sequence and HLA typing on HCV infected and HCV/HIV co-infected patients to characterise at the single amino acid level all the selection effects apparent in the HCV genome. A customised program Epipop has been designed to perform multivariate and other analyses on the generated data. Using this approach we have been able to show conserved sites within HCV that are likely to reflect structural or functional constraints; and the association of specific HLA alleles with HCV mutations some of which are within or flanking known HCV CTL epitopes.

The knowledge of selection effects associated with HLA-restricted immune responses will be used to construct predictive models of HCV infection outcome and disease progression in the individual, given HLA genotype and HCV sequence.
ANALYSES OF SUCCESSFUL AND UNSUCCESSFUL IMMUNE RESPONSES AGAINST HEPATITIS C VIRUS USING MHC CLASS II TETRAMERS FOR THE STUDY OF CD4+ T CELLS

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Cellular immune responses play an important role in the control of hepatitis C virus (HCV) infection. Ex vivo studies of cellular immune responses have been greatly enhanced in recent years through the emergence of novel quantitative ex vivo techniques. CD8+ T cells can be readily detected ex vivo in acute disease using MHC class I peptide tetrameric complexes (tetramers). Only recently stable MHC class II tetramers have been generated. Ultra-sensitive enrichment techniques using magnetic beads may be required in order to define anti-viral populations, but there can now be readily detected in blood. These allow studies of the CD4+ T cell response in different clinical settings. In particular we are able to study whether the loss of CD4+ proliferative responses in persistent infection occurs as a result of deletion of cell subsets or changes in function of remaining populations.

To assess this, longitudinal analysis of individuals undergoing acute infection with resolution or leading to persistence have been performed and combined with studies of proliferative capacity and cytokine secretion. We have shown that in resolved infection, stable tetramer+ populations are present which retain functionality, while in established chronic infection detection of functional CD4+ T cells and tetramer+ populations is rare. However, in acute infection, very large tetramer+ clouds can be seen which lack proliferative capacity ex vivo and may also lack cytokine secretion capacity. These studies shed the first light on the functional status of CD4+ T cells in acute disease - CD4+ T cell dysfunction may explain the failure to control virus in the majority of patients.

RESOLUTION OF TRANSIENT HEPADNAVIRUS INFECTIONS IS ACCOMPANIED BY HISTOLOGIC EVIDENCE OF MARKED HEPATOCYTE DEATH AND LIVER REGENERATION

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By tracing the fate of hepatocytes with integrated WHV DNA, we showed that a minimum of 0.7 to 1 complete turnovers of the infected hepatocyte population occurred during resolution and that the recovered liver was populated to a large extent by previously infected hepatocytes that had undergone one or more cell divisions (Summers et al., 2003. PNAS 100: 11652-9). In the present study, we show that resolution was accompanied by dramatic increases in inflammatory cells, apoptotic hepatocytes and number and size of PAS-diastase (PAS-D) positive Kupffer cells, providing supporting evidence for the role of cell death in the resolution of infection. 3 adult woodchucks were inoculated with 2x10^6 WHV genomes and the course of their WHV infection was studied for 16 wks. At week 4 infection had spread to >95% of hepatocytes (64-70% of lobular cells), Kupffer cells comprised 5-9% of lobular cells and little or no inflammation was detected. At week 8, >95% of hepatocytes were still WHV-infected. Remarkably, Kupffer cells had increased in size, due to the accumulation of PAS-D-positive material, and had also increased in number to 25-29% of lobular cells. Portal tracts had expanded from 0.05-0.25% to 2.0-6.7% of liver area and lobular inflammation had increased so hepatocytes comprised only 34-41% of lobular cells. Increases in inflammation coincided with increased numbers of apoptotic hepatocytes (0.34-1.58%). At week 12, <0.01-49% of hepatocytes were WHV-positive with a patchy, zonal distribution suggesting that WHV infection is cleared in a cell-by-cell pattern, apoptosis was marked, occurring in up to 10-20% of cells predominantly in the zones of the liver that contained WHV-positive hepatocytes, while hepatocytes and PAS-D-positive Kupffer cells comprised 37-57% and 19-24% of total lobular cells. By week 16 resolution of WHV infection had occurred, PAS-D-positive Kupffer cells comprised 11-16% of lobular cells and the number of hepatocytes, and levels of inflammation and apoptosis had returned to pre-infection levels. We conclude that death of infected hepatocytes plays a major role in the resolution of infection whilst non-cytolytic mechanisms including cytokines and antibodies may play roles in breakdown of viral nucleocapsids and to protect cells from re-infection.
Epidemiology of Injecting Drug Use in Australia

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There is considerable research evidence showing that injecting drug use is a major factor contributing to the transmission of hepatitis C in Australia; injecting accounts for more than 90% of new hepatitis C cases. The present talk will provide an overview of current research on trends in the epidemiology of injecting drug use in Australia. This will be drawn from a number of early warning systems in place across Australia to monitor trends in illicit (and injecting) drug use. It will also draw from recent work examining changes in drug markets in Australia that were documented by these monitoring systems, and consider the implications of these changes for the epidemiology of, and response to, hepatitis C in this country. Changing and emergent patterns of drug use will also be outlined and their implications for hepatitis C infection. For example, increased cocaine use was detected in 2001, flagging a potential increase in injecting risk. Similarly, increases in potent forms of methamphetamine have also been reported, also suggesting increased injecting risk. In particular, the monitoring of illicit drug markets was instrumental in the detection and validation of the “heroin shortage”, which had important implications for drug use and associated behaviours and the public health implications. This talk will describe some of these changes in their impact on hepatitis C in further detail.

Exploiting Social Networks will Advance Hepatitis C Epidemiology

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Hepatitis C virus has existed at high prevalence among Australian injecting drug users (IDUs) since the early 1970s. Around 60% of current IDUs have been exposed to HCV, 75% of whom are chronic carriers. HCV incidence rates calculated over the past decade range from approximately 10% to 30% per annum. Despite substantial decreases in needle-sharing and other risk behaviours and widespread provision of needles and syringes, which are credited with preventing an HIV epidemic in Australian IDUs, neither HCV prevalence nor incidence estimates are diminishing. After nearly fifteen years of epidemiological research, the reasons why world-leading harm reduction measures and significant behaviour change have worked well for HIV but not HCV remain unclear, and promising options for reversing the HCV epidemic are lacking.

While still very far from producing definitive answers, recent work involving IDUs’ social networks has offered a new framework for thinking about HCV epidemiology, and generated some tantalising data. Networks of social relationships are fundamental to epidemiology, because they represent pathways for the transmission of most infectious diseases; however, they have been exploited infrequently to date. Because social network methods allow relationships to complement individuals as the units of analysis, data quantity and quality can be increased. IDUs’ behaviour becomes “endpointed” – HCV infection risks taken with other study participants are revealed and can be integrated into analysis, enabling unique insights into HCV epidemiology. For example, preliminary data from the Burnet Institute’s social networks study (NHMRC grant #111701) showed that two thirds of unexposed IDUs’ injecting partners were HCV RNA+, and they injected with RNA+ve network members nearly twice a week on average. Such data are potentially capable of filling existing gaps in our understanding of HCV transmission, and demonstrate that social network methods have a lot to offer the field.
TRENDS IN LONG-TERM SEQUELAE OF HCV INFECTION IN AUSTRALIA, 2005-2020

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The Hepatitis C Virus Projections Working Group estimated HCV incidence to be 16,000 new infections in Australia during 2001, with 90% of new infections transmitted through injecting drug use. While HCV incidence in injecting drug users (IDUs) remains high, around 20% per year among IDUs attending the Kirkton Road Centre in Sydney, recent estimates are that the number of IDUs injecting heroin has decreased in Australia since 2000. New HCV notifications among people aged 15-19 and 20-24 years, which might reasonably be assumed to be recent HCV infections, also peaked in 2000 with fairly substantial declines in 2001 and 2002.

We used previously developed models of HCV disease progression to investigate what effect uncertainty in recent and ongoing HCV incidence might have on projections of long-term clinical outcomes of HCV infection, such as cirrhosis, liver failure, hepatocellular carcinoma (HCC) and HCV-related mortality. Three scenarios were investigated. First, a pessimistic scenario that HCV incidence rates continue to increase at the rate seen during the 1990s; second an optimistic scenario in which HCV incidence was assumed to peak during 2000, followed by 20%, 15%, 10% and 5% declines per annum through 2004, with rates stable thereafter; and third, an intermediate scenario in which HCV incidence rates were kept at levels estimated for 2000 through 2020.

Under all scenarios, numbers of people living with HCV-related cirrhosis continued to increase through 2020. Numbers of people living with cirrhosis in Australia in 2020 were projected to be 25,700, 22,600 and 20,900 for scenarios 1, 2 and 3 respectively. Similar trends were seen for liver failure, HCC and HCV-related mortality.

Although ongoing decreases in HCV incidence would have a major impact on quality of life lost to HCV-infection, these models suggest that unless very effective HCV treatment becomes widely available, the long-term clinical outcomes of HCV infection are likely to continue to increase in Australia through 2020.
ASSSESSMENT AND MANAGEMENT OF DEPRESSION IN THE SETTING OF COMORBID ADDICTIVE DISORDERS

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Patients with a history of depression are often denied access to HCV treatment because interferon elicits significant neuropsychiatric toxicity. This proscription disproportionately affects substance users, even though little is known about the impact of psychiatric illness on HCV adherence and outcomes in this population. In addition, little has been published about the best strategies to monitor and manage emerging psychiatric conditions in these patients. This talk will present our current data on hepatitis C treatment in patients with psychiatric illness and comorbid addictive disorders. Our results to date suggest that although virologic response rates may be modestly lower than patients without psychiatric illness, these patients can be safely and successfully treated. Furthermore, although standard psychiatric testing batteries may have limited utility in comorbid patients, pretreatment with antidepressants may improve adherence and treatment outcomes.

SHARED CARE: WHAT MAKES IT SUCCESSFUL

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Shared care for patients with hepatitis C initially should begin with GPs who provide standard hepatitis care such as patient information, testing, counselling, monitoring and referral. Education for GPs and the development of partnerships between GPs, patients and tertiary specialists are important factors to consider when implementing this stage of the shared care model.

The second phase of this model involves the patient, specialist, nurse, GP and other health professionals who manage the patient during the treatment program. At this stage the successful implementation of the shared care model is attributed to several important factors.

The first is the acknowledgment by the hospital clinic that this model of management is ‘best practice’. Second, is the involvement of motivated consultants, who are prepared to hand over most aspects of care. The third is the nurse consultant who acts as a point of liaison between the patient and other collaborating members of the treatment team. Shared care is most beneficial to the patient’s health outcomes when GPs become involved in patient care.
MANAGEMENT OF ANAEMIA, NEUTROPENIA AND THROMBOCYTOPENIA

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The combination of pegylated interferon and ribavirin is the current worldwide standard of therapy for chronic hepatitis C infection with overall sustained response rates exceeding 50%. Optimal responses occur when patients, especially those with genotype 1, receive complete courses of both drugs. Maintenance of adequate doses of ribavirin appears to be especially important in achieving a sustained virological response. However, haematological side effects with decreased numbers of circulating red blood cells (anaemia), white cells (neutropenia) and platelets (thrombocytopenia) are commonly encountered during treatment and in some instances may require dose reduction, thus compromising the outcome of therapy.

Strategies to avoid dose reduction in order to increase the likelihood of achieving viral eradication include lowering the threshold for triggering reduced doses of either interferon or ribavirin and the use of haematopoietic growth factors such as erythropoietin (Epo) and granulocyte colony stimulating factor (GCSF). Clinical trials of liver targeted oral prodrugs of ribavirin, such as viramidine, are currently in progress and if successful may decrease or obviate the need for ribavirin in its current formulation. Novel but relatively untested approaches, especially for control of thrombocytopenia, include radiological and surgical methods to decrease splenic sequestration of blood elements.

REDUCING HEPATITIS C VIRUS TREATMENT RELATED MORBIDITY

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Hepatitis C anti viral therapy is associated with a wide range of side effects varying from minor to life threatening events. Treatment experiences are individual. There are no readily identifiable predictive factors associated with an individual’s predisposition to experience physical side effects, the intensity of side effects or client’s coping ability. Psychological screening may identify patients predisposed to neuropsychiatric symptoms, but depression and suicide have been reported in patients with no prior symptomatic history.

Monitoring and management of treatment related side effects often challenge clinician’s skill, knowledge base and clinic resources. Ineffective management may compromise patient’s state of well being, patient safety and treatment completion. Whilst side effects are well described in the literature, management of treatment related side effects is limited and frequently anecdotal. Strategies and practical solutions to manage commonly reported mild to moderate side effects, the use of support networks and the benefits of using a multi disciplinary team of health care professionals will be discussed.
INTERACTIONS BETWEEN HEPATITIS B AND HEPATITIS C VIRUS IN A HUMAN HEPATOMA CELL LINE (HUU-7)

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Co-infection with hepatitis B virus (HBV) and hepatitis C virus (HCV) increases the severity of chronic liver disease and the risk of developing hepatocellular carcinoma (HCC). While much is known about the molecular biology of these two viruses, little is known about their interactions within the co-infected hepatocyte, although HCV is thought to suppress HBV replication clinically. Previous studies have attributed this suppression to interactions between the HCV core protein and the HBV enhancer elements, HBx protein and the HBV polymerase. Our aim was to investigate interactions between the HCV core protein and HBV promoter/enhancer elements using a reporter assay system and interactions between HBV and HCV in cells supporting replication of both viruses.

HBV promoter/enhancer regions were cloned into pGL3-Basic upstream of the luciferase reporter gene. These constructs were co-transfected along with pRcCMV-core (expressing the HCV core protein) into Huh-7 cells. HBV promoter/enhancer constructs were also transfected into sub-genomic and genomic HCV replicon cell lines. HBV promoter/enhancer activity was measured by luciferase assay. Replication of HBV and HCV in the same cell was initiated by transduction of the HCV replicon lines with an HBV-containing baculovirus that initiates HBV replication.

HCV core protein significantly suppressed HBV promoter/enhancer activity (4-24 fold). In contrast, HBV promoter/enhancer activity was enhanced in both HCV replicon cell lines (2-23 fold). Immunofluorescence microscopy revealed that the two viruses could replicate within the same cell with no effect on hepatocyte morphology or viability. Real-time PCR indicated no change in intracellular HBV DNA or HCV RNA levels during co-replication, however a 2.5-fold increase in extracellular HBV DNA was noted.

Our results suggest over-expression of HCV core protein in vitro can suppress HBV promoter/enhancer activity, however this was not seen in the presence of replicating HCV. We also report for the first time that HBV and HCV can replicate within the same hepatocyte in vitro with little to no effect on cell morphology or viability or the replication of the other virus. These findings suggest that other factors may play a role in the intracellular interactions of HBV and HCV resulting in the suppressive effects observed clinically.

CHARACTERISATION OF LAMIVUDINE RESISTANT HEPATITIS B VIRUS (HBV) MUTATIONS IN HIV AND HBV CO-INFECTED INDIVIDUALS

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Lamivudine (LMV)-resistant HBV develops rapidly in HIV-HBV coinfected individuals. We sought to determine the prevalence of and to characterise the pattern of LMV resistant mutations in the viral polymerase as well as the overlapping envelope gene using an international group of HBV/HIV co-infected patients receiving LMV as a component of HIV therapy.

A total of 98 HBV/HIV co-infected individuals from Melbourne, Sydney and the United States (Multicenter AIDS Cohort Study) were included in this study. Samples from 63 patients (64%) had HBV DNA detectable by PCR. HBV genotype A was the predominant genotype, representing 80% of patients, 11% were genotype D, 8% were genotype G and one patient was infected with a mixture of genotypes A and G. LMV resistance mutations were detected in 62% (39/63) of viraemic patients, in which the prevalent resistance pattern was the combination of rtL180M + rtM204V (82%). A number of unique polymerase mutations were also detected, including the triple combination rtV173L + rtL180M + rtM204V, which was present in 23% (9/39) patients with LMV resistance. Due to the overlapping reading frames of the polymerase and envelope genes, this triple mutation also altered the envelope gene at positions D164E + sI195M. HBV with these envelope mutations has reduced antigen/antibody binding activity similar to a HBV vaccine escape mutant. Envelope mutations were also detected within the ‘a’ determinant at positions M133I, S143M, S154L, S144E and S120T.

In conclusion, HBV LMV resistance was found in 40% of HIV-HBV co-infected individuals. Twenty-three percent of persons were found to be infected with a LMV-resistant HBV strain which could be potentially transmissible to vaccinated individuals.
MOLECULAR MODELLING OF HEPATITIS B VIRUS POLYMERASE: CHARACTERISATION OF ADEFOVIR RESISTANCE

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The antiviral treatment of chronic hepatitis B is limited by the selection of antiviral resistance mutations. To gain an understanding of the hepatitis B virus (HBV) polymerase and also mutations associated with resistance, a three-dimensional model of the HBV reverse transcriptase (rt) core region based on homology with HIV was created. Primary resistance to lamivudine occurs at rtM204I/V (C domain) +/- rtL180M (B Domain) of the polymerase. Previous molecular modeling studies have proposed that these mutations cause steric hindrance between the changed amino acid (rtM204I/V) and the sulphur atom in the oxathiolane ring of LMV tri-phosphate (TP). Recently, we have identified resistance to adefovir (ADV). Resistance to ADV is associated with a mutation in the D Domain at rtN236T that may potentially result in the indirect perturbation of the tri-phosphate binding site and alter the interaction with ADV-TP. In addition, to this mutation a mutation in the B domain at rtA181T/V was detected. In the HBV polymerase model these mutations alter the position of rtM204 relative to the nucleotide binding pocket in an indirect mechanism of steric hindrance. In vitro antiviral resistance testing demonstrated that these mutations were associated with a reduced sensitivity to ADV.

In conclusion, molecular modeling is an important tool in understanding the significance of mutations selected during antiviral treatment and the potential mechanism of antiviral resistance. It may provide insights for the improved treatment of patients on monotherapy and multiple combinations of antiviral agents.

FUNCTIONAL ANALYSIS OF THE HEPATITIS B VIRUS RTL80I MUTANT SELECTED IN PATIENTS WITH SEVERE HEPATITIS DURING LONG TERM LAMIVUDINE THERAPY

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The ongoing use of antiviral therapy in the presence of viral replication results in continuous selection of potentially compensatory mutations within the hepatitis B virus (HBV) genome. The aim of this study was to characterize potential compensatory mutations that have arisen in addition to primary Lamivudine (LMV) resistant mutations. In addition to the well characterized LMV resistant mutations at rtM204I/V (C domain) +/- rtL180M (B Domain), an rtL80I (A Domain) mutation was the main change detected in patients on long term LMV therapy. The rtl80I mutation does not alter the HBsAg. Molecular modeling of the HBV polymerase revealed that the rtL80I did not directly interact with LMV and maps to the nucleotide-binding pocket of the polymerase. The rtl80I alters the shape of the nucleotide-binding pocket which may affect viral replication by altering the processivity of the enzyme. The relative replication yield phenotype and antiviral sensitivity to LMV was compared for HBV clones encoding the LMV resistant mutation in combination with the rtl80I. The rtl80I mutation acted as a compensatory mutation and significantly increased the replication yield phenotype of the rtM204I HBV clone. However, the combination of the rtM204I/V mutations with the rtl80I resulted in a reduced antiviral sensitive phenotype to LMV. There was no reduction in sensitivity to Adefovir. As selection of rtL80I was found to have a higher replication yield phenotype in vitro, it may have contributed to the severe hepatitis observed in these patients during long term LMV treatment.

In conclusion, the rtl80I mutation in association with the LMV resistant mutations were selected on long term LMV therapy. Due to the ongoing selection of compensatory mutations, these observations argue strongly against the practice of using antiviral therapy in patients viraemic with resistant HBV.
REDUCED HBV-SPECIFIC CD4+ T-CELL RESPONSES IN HIV-1-HBV CO-INFECTED INDIVIDUALS RECEIVING HBV-ACTIVE ANTIRETROVIRAL THERAPY

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Functional HBV-specific T-cells are significantly diminished in individuals chronically infected with HBV as compared to those with self-limiting HBV infection. HBV-specific T-cells found in the liver may cause an inflammatory response but be ineffective in clearing the virus. In individuals infected with HIV-1, co-infection with HBV is associated with an increased risk of persistent HBV infection, and more rapid HBV disease progression. However, the specific effect of HIV-1 infection on HBV-specific T-cell immunity has not been characterized. In order to understand the immunopathogenesis of HBV in the setting of HIV-1 co-infection, better methods are needed to study HBV T-cell immunity.

Total HBV-specific T-cell responses in subjects with diverse genetic backgrounds were characterized using a library of 394 15-mer peptides overlapping by 11 amino acids spanning all HBV proteins. An additional 149 15-mer peptides were designed to regions of high variability between HBV genotypes A to D. The magnitude and breadth of CD4+ and CD8+ T-cell responses to HBV in peripheral blood was examined using flow cytometry to detect the IFN-γ production following stimulation with HBV peptide pools. In HIV-1 infected patients, peptide pools to HIV env, gag, pol and accessory genes (obtained from the NIH reagent database) were analysed on the HBV vaccine peptide pools. In HIV-1 infected patients, peptide pools to HIV env, gag, pol and accessory genes (obtained from the NIH reagent database) were analysed on the same blood sample. Background responses were initially evaluated using HBV-negative donors (n=8). HBV chronic carriers were studied (n=34), including individuals never treated for HBV infection (n=7), HBV-infected individuals receiving anti-HBV therapy (n=13) and HIV-1-HBV co-infected individuals receiving anti-HBV therapy (n=14).

HBV-specific CD4+ T-cell responses were more frequent and broader in subjects on anti-HBV treatment as compared to untreated HBV chronic carriers (p=0.046). Effective suppression of HBV viral load was an important factor in the reconstitution of HBV-specific responses both in mono- and co-infected individuals (p=0.035). Although, HBV-specific CD8+ T-cell responses were comparable between the mono- and HIV-1-HBV co-infected groups, HBV-specific CD4+ T-cell responses were significantly reduced in HIV-1-HBV co-infected individuals (p=0.033).

Therefore HIV-1 infection has a potentially significant effect on reducing HBV-specific T-cell immunity.

THE THERAPEUTIC USE OF A DNA VACCINE CONTAINING T-CELL EPITOPES OF DUCK HEPATITIS B VIRUS (DHBV)

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Previously we demonstrated that a DHBV DNA vaccine containing immunodominant T-cell epitopes was able to protect 2/7 ducks from infection when challenged with DHBV. In one of these ducks this protection was due to vaccine induced neutralising antibodies. We now examine the effect of using this vaccine therapeutically.

The DNA vaccine was produced incorporating immunodominant DHBV surface antigen T-cell epitopes and used to vaccinate six ducks experimentally infected at one day of age. 50µg DNA vaccine in 300µL PBS without adjuvant was injected intradermally and intramuscularly on days 19, 26, and 34. Six infected control ducks were similarly injected with PBS. The ducks were bled once a week, and liver obtained at euthanasia (day 70) and presence of DHBV determined by PCR and dot blot hybridisation.

All of the ducks were viraemic by dot blot hybridisation previous to DNA vaccination or PBS injection. The controls and the DNA vaccinated groups had a similar average level of viraemia prior to treatment. None of the ducks were able to completely remove DHBV DNA from the serum and all were dot blot hybridisation positive in the liver at the end of the experimental period. However, the average viraemia of the DNA vaccinated ducks decreased by almost a log10 (to ~20% of the pre-treatment level), while the controls increased by a log10 (to ~100% of the pre-treatment level).

The average quantity of virus present in serum of the therapeutically vaccinated ducks at day 70 was 2log10 lower or approximately 1% of that of the control group. Although no duck was able to completely clear the infection, the use of a different delivery system, adjuvants or combination therapy with antiviral drugs may lead to better results. The use of a therapeutic DNA vaccine does however show promise from the results obtained in this small scale preliminary experiment.
Hepatitis B and C and Liver Cancer in New South Wales 1990–2002: A Linkage Study

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Increases in the incidence of hepatocellular carcinoma (HCC) over the last two to three decades have been reported in many countries including Australia. Over a similar time period there have been increases in the incidence of hepatitis B and C. Chronic hepatitis B and C infections are known to be two of the three most significant risk factors for HCC. In this paper we examine the incidence of HCC among people with hepatitis B and/or C and the proportion of HCC cases that have been notified with hepatitis B and/or C.

The study involved probabilistic data linkage of 39292 hepatitis B, 76146 hepatitis C and 5380 hepatitis B and C co-infected cases notified to the NSW Department of Health with incident cancer cases notified to the NSW Central Cancer registry between 1990 and 2002. Rates of HCC (ICD 10 coded 22.0) in persons with hepatitis B, C or co-infected were then calculated. The change in proportion of HCC cases who were also notified with hepatitis B and/or C was also determined.

Crude rates of HCC among people notified with hepatitis B, C and co-infected cases notified to the NSW Department of Health with incident cancer cases notified to the NSW Central Cancer registry between 1990 and 2002. Rates of HCC (ICD 10 coded 22.0) in persons with hepatitis B, C or co-infected were then calculated. The change in proportion of HCC cases who were also notified with hepatitis B and/or C was also determined.

The number of HCC notifications increased from 82 in 1990, to 175 in 1998, to 208 in 2002 with a total of 2069 HCCs reported over the period of investigation. From 1998 to 2002 the number of HCC notifications that were also notified with hepatitis B increased from 27 (15.4%), to 40 (19.2%) and likewise hepatitis C increased from 29 (16.6%) to 39 (18.8%).

Our data show that significant numbers of people with hepatitis B and C are affected by HCC. The increase in HCC is at least partly attributable to hepatitis B and C. The 2002 Hepatitis C Virus Projections Working Group report estimated that approximately 50 cases of HCC nationally in 2001 could be attributed to hepatitis C infection. Our findings suggest the true attributable number is higher.

Mother to Infant Hepatitis C Virus Transmission

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Since screening of blood and blood products was introduced vertical transmission of HCV from infected mothers is the predominant transmission route for acquisition of childhood infection. Theoretically, vertical transmission of HCV may occur intrauterine during parturition, or postnatal. The factors that determine whether or not an infant actually becomes infected need to be identified.

A total of 6849 pregnant women were tested for α-HCV, and 141 (2%) were positive. None of these were infected with human immunodeficiency virus (HIV). Consenting mothers were tested for HCV RNA between 16 and 20 weeks and again at 36 weeks of gestation by PCR. Infants were tested for HCV RNA between 2 and 4 days of birth and for α-HCV and HCV RNA at >6 months of age. Infected infants blood and mothers blood were sequenced to confirm homology.

Ninety-three mothers agreed to be in the study and 61 of these were HCV RNA positive. No transmission of infection occurred from non-viraemic mothers. Two (2.8%) babies born to the 61 viraemic mothers were HCV RNA positive at 3 days of age suggesting intrauterine transmission of infection. These mothers had titres of 2 X 10^6 and 1.8 X 10^6 copies/mL around delivery. Twenty-nine babies have been bled at >6mths of age. Of the 21 babies born to viraemic mothers, 2 (9.5%) were found to be HCV RNA positive and had a high α-HCV titre (12.1 and 15.6, cut off = 1). The viral titre of their mothers were 1.3 X 10^7 and 1 X 10^6 copies/mL. 1 infected baby was born by elective caesarean. Quasi-species analysis of the mothers blood is continuing.

All 4 mothers of infected babies had a high viral titre around delivery time confirming that viral load is an important risk. Vertical transmission can occur intrauterine and delivery method may not effect the vertical transmission.
THE PREVALENCE OF HEPATITIS B IN 2120 PATIENTS UNDERGOING ENDOSCOPY IN AN AUSTRALIAN HOSPITAL AND THEIR RISK FACTORS FOR INFECTION

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The objective of this study was to determine the prevalence of current and past hepatitis B infection in endoscopy patients and to relate this to risk factors for exposure.

Participants’ sera were tested for hepatitis B markers by Cobas Core II system (Boeringer Mannheim/Hoffmann la Roche, USA). HBsAg positive patients were tested for HBV DNA by in house assays. A risk factor questionnaire was administered and the results analysed using the SAS statistical package.

Of the 2120 participants, 2.1% were currently infected (HBsAg positive), 0.7% were still actively vireamic (+HBsAg & +HBV-DNA), 1.5% non-vireamic (+HBsAg & -HBV-DNA), 9.6% were infected in the past (+anti-HBcAg). 19.9% were vaccinated and the remaining 68.5% were susceptible to infection. 244 (11.5%) of patients were currently or had previously been infected with HBV. Of these patients 81.6% had cleared the infection while 18.4% remained currently infected, but of these only 31% were vireamic.

Current or past infection with HBV, on univariate analysis, was significantly associated with gender, age, place of birth, migration date, blood transfusion (and when), operation (the number and where), dentists visit, endoscopy (type), injecting drug use (and when), ears piercing (when, where and by whom), acupuncture and where, household contact with HBV (and when), residence in a corrective or military institution (and how long), vaccination with hepatitis A, vaccination with hepatitis B (and when), having a chronic illness (and when), diagnosis with HIV, past diagnosis with hepatitis (and when) and whether the patients was immune suppressed.

On multivariate analysis, current or past infection with HBV, remained significantly associated with gender, place of birth, the date diagnosed with hepatitis, hepatitis B vaccination, diagnosis with HIV, household contact with hepatitis (the date), the date injected drugs and residence in a corrective or military institution with hepatitis B.

THE SHORT FORM-36 (SF-36) DOES NOT IDENTIFY SIGNIFICANT IMPAIRMENTS IN QUALITY OF LIFE DUE TO SYMPTOM CLUSTERS IN PEOPLE LIVING WITH CHRONIC HEPATITIS C INFECTION

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Quality of life (QOL) has been shown to be impaired in people living with chronic hepatitis C infection (HCV). The Short Form-36 (SF-36) is the instrument most widely used to measure Health-related QOL (HRQOL). Our previous research identified 21 individual symptoms that impacted on QOL in people living with HCV. Additionally, many participants complained of recurrent debilitating episodes with clustering of symptoms. The aim of this research was to characterise the symptom clusters and assess the relationship between these and SF-36 scores.

188 HCV antibody positive, treatment-naïve people participated in a cross-sectional interview-based study (125 men; mean age 42±10 years). Prevalence of 21 symptoms and their severity was measured using Visual Analogue Scales (0-10). Subsequent data reduction (Principal Components Analysis (PCA)) identified four symptom clusters and calculated individual regression factor scores. The SF-36 scores for the physical health and mental health domains were calculated.

The PCA identified four internally consistent clusters (Cronbach alpha coefficients of 0.87, 0.78, 0.81 and 0.68 respectively). These clusters (and associated symptoms) were: Neuropsychiatric (mental tiredness, poor concentration, forgetfulness, depression, irritability, physical tiredness and sleep problems); Gastroenterological (day sweats, nausea, food intolerance, night sweats, abdominal pain, poor appetite and diarrhoea); Algesic (joint pain, muscle pain and general body pain); and Dyasaesthetic (noise sensitivity, light sensitivity, skin problems and headaches). People living with HCV scored significantly (p<0.001) lower (worse) SF-36 scores than an Australian healthy population. The Mental component score demonstrated a large significant inverse correlation with the Neuropsychological cluster of symptoms (Pearson’s r = -0.251, p=0.001) and Dyasaesthetic (Pearson’s r = -0.215, p=0.003). The Physical domain demonstrated a large inverse correlation with the Algesic (Pearson’s r = -0.524, p<0.001) and a low inverse correlation with the Gastrointestinal cluster (Pearson’s r = -0.248, p=0.001).

These results demonstrate that symptoms occur in clusters and confirm that HCV infected people have worse SF-36 scores than a healthy population. Although widely used, the SF-36 does not correlate well with the symptoms present in the Gastrointestinal and Dyasaesthetic clusters and does not accurately identify impairments of QOL in people living with HCV.
THE EFFECTS OF INTERFERON AND RIBAVIRIN TREATMENT ON PATIENT PERCEPTIONS OF COPING

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The commencement of interferon and ribavirin therapy for patients with hepatitis C may be viewed as a stressful event. The type and severity of a stressor has been shown to directly influence the way an individual copes with each stressful situation. Inherent in the coping process, is the subjective appraisal and interpretation of the stressful event by the individual.

The brief COPE was administered to twenty-four patients who were eligible for interferon and ribavirin treatment at the Outpatient Department at Fremantle Hospital. Questionnaires were administered four-weekly for the first twelve weeks of the treatment program.

An increase in substance use for males and females was observed during the initial twelve weeks of therapy (p < 0.05). Both male and female patients appeared to have engaged in aspects of denial (p < 0.01). Male patients tended to turn to religion (p < 0.05) during the initial twelve-week treatment period. A statistically significant effect was observed for male and female patients on the Planning Subscale of the brief COPE Inventory (p < 0.01).

The effects of interferon and ribavirin treatment on patients’ ability to cope with the treatment can be observed in terms of either an adaptive or maladaptive response. The observed increase in substance use may have detrimental effects in terms of sustained virological responses.

GENERAL PRACTITIONER HCV TRAINING NEEDS SURVEY A SUMMARY OF RESULTS

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HCV continues to present major challenges to health in Australia and the level of knowledge and skill in managing HCV infection among General Practitioners (GPs) has been a common discussion topic. The Survey aimed to ascertain the level of Hepatitis knowledge of GPs in Queensland; where GPs find this information; and how GPs preferred HCV information to be delivered.

In February 2004 the HIV & HCV Education Projects of the School of Medicine conducted a mailout survey of all Medical Practitioners registered with the Medical Board of Queensland. Replies were anonymised. The survey asked questions to assess respondents knowledge of hepatitis A, B and C and sought information in the following areas: demographic data; HCV caseload; Familiarity with HIV & HCV Education Courses in HCV in Queensland; Current methods of accessing HCV information; Preferred mode of HCV education delivery; and reasons for not participating in HCV training. Data analysis was conducted using SPSS 11.5 for Windows.

11,346 surveys were sent and 3,156 were returned (27.8% return rate). The following results are based on 1,141 surveys returned by GPs practicing in Queensland. The majority of GPs who answered the survey (62%) had a case load between 1 and 5 patients while only 13% did not have a case load of patients with HCV and 10% had caseloads more than 10 patients. When asked where they obtained information on HCV, replies included: journals and publications (96%); Specialists in HCV (68%); and work colleagues (54%). The four preferred modes of delivery of HCV information were: fact sheets (88%); face to face CME activity (79%); case based activities (57%); and video / CD-ROM information (53%).

Analysis of the 13 questions on Hepatitis knowledge is ongoing but preliminary review has shown that up to 44% of respondents think that HCV cannot be eradicated by treatment and that 69% incorrectly identified the percentage of individuals with HCV who are past or present injecting drugs users.

This survey answers the questions often asked about GP HCV knowledge and preferred methods of education and provides an evidence base for further funding in education in this area.
HANGIN’ IN: A PEER EDUCATION MODEL FOR YOUNG INDIGENOUS DRUG USERS BY YOUNG INDIGENOUS DRUG USERS

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The increasing rate of HCV transmission amongst highly marginalised groups of Indigenous injecting and illicit drug users, is complex. Indigenous Australians deal with a range of issues daily that affect their health such as racism, poverty, housing, education and incarceration. In such circumstances, drug use is often seen as part of the solution, not as a problem.

This situation exacerbated by marginalised groups not having a voice to challenge discriminatory or stereotypical images of themselves. This works to compound health and social issues and for drug use to remain hidden. Peer education encourages drug users to talk and learn from each other, in a non-judgemental manner, without fear of being criticised or condemned.

“Hangin In...” resulted from a year-long, peer driven project, by a group of young, skilled Indigenous drug users. This project, supported by the Australian Injecting and Illicit Drug Users League (AIVL), was developed by these young people to speak to their issues. This peer model enabled AIVL to have long-term contact with young Indigenous drug users, to ensure critical health information was received.

The success of this project created enormous potential for this group, not only to improve service provision in their community but also to actively advocate for meaningful change. The outcomes of this project will be discussed, as well as, the peer education model that facilitated the process and assisted these young, talented people in their achievements.

BUILDING BLOCKS, BUILDING CAPACITY: WORKING TOGETHER TOWARDS YOUTH-DRIVEN HCV PROGRAMS

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In the province of British Columbia, Canada, over 15% of all newly reported HCV tests are among youth ages 15-29. This number increases significantly when taking into account the number of individuals who seroconvert in their youth, but do not get tested until their symptoms manifest later in life. Almost two-thirds of new infections across the country are associated with injection drug use. Recent studies in Canada have also revealed that 22% of injection drug users used a shared needle the first time they injected, and that at the time of first injection, almost half were under the age of 20.

YouthCO AIDS Society is a non-profit organization in Vancouver, Canada working to involve youth ages 15-29 from all communities in addressing HIV/AIDS and related issues. As a youth-driven agency, it provides educational initiatives (prevention, training, volunteer opportunities) and outreach/support services to youth infected with and affected by HIV/AIDS and/or Hepatitis C (HCV).

In 2000, YouthCO launched an integrated response to the increasing rates of HCV infection among local youth populations. The project created HCV-related support and outreach to youth, as well as youth-driven prevention resource materials, trainings, and a volunteer peer education program.

Based on the successes of this project and the organization’s cumulative capacity to provide cutting-edge HCV programming, YouthCO built collaborative relationships with Health Canada and community partners in order to broaden its scope. Subsequent initiatives included two provincial youth conferences, two awareness videos, a training series for youth service providers, the coordination of a national youth symposium, and a province-wide network of trained peer educators.

We will report on the incremental steps taken by YouthCO to increase its capacity and resources. We will highlight the use of peer education methodologies and strategies for working and building trust with communities and funding bodies. Participants will have an opportunity to brainstorm and problem-solve solutions for overcoming barriers to providing an effective, sustainable, long-term, youth-driven response to HCV.
TESTING AND DIAGNOSIS: INJECTING DRUG USERS EXPERIENCE COMPARED TO NATIONAL POLICY

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The differences between how an injecting drug user experiences hepatitis C testing and diagnosis and the national policies can be quite vast. The National Hepatitis C Testing Policy put out by the Australian National Council on AIDS, Hepatitis C and Related Diseases (ANCAHRD) in August 2003 steps out guiding principles for hepatitis C testing, including recommended approaches to diagnostic testing.

I am looking to compare how this relates to practice, by providing quotes and feedback from injecting drug users who have been tested and/or diagnosed with hepatitis C recently. I will go through the guiding principles of the national policy and highlight where these principles are not being followed as well as where they are being followed. This will provide an insight into what is actually happening at the ground level, thus providing an opportunity to see what is working and what areas need to be improved within the overall testing process.

From this analysis of what is working and what needs improving I will make recommendations on how the testing process can be improved.

IS IT MY HEP C?

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The symptoms of hepatitis C are usually described in very general terms such as fatigue, nausea and “flu-like” when many people experience very specific symptoms that often occur in clusters, or as what people sometimes describe as “attacks”.

People living with hepatitis C are often unsure whether some of the very specific health problems they experience are in fact hepatitis C symptoms or something else, and when they turn to their doctors for advice and treatment for these problems, often the doctor cannot tell them for certain if what they are describing is hepatitis C-related or not, and there is sometimes little in the way of treatment for specific symptoms on offer.

This “not knowing” about whether their hepatitis C is the cause of their symptoms can contribute to the anxiety that many people living with the virus report, and can make it difficult to decide whether combination drug therapy is worth trying or not, especially if they also have other health problems that can cause similar symptoms to hepatitis C.

This paper will also argue that dissatisfaction with the way symptoms are dealt with is one of the main reasons so many people with hepatitis C turn to alternative medicine – they are seeking validation and treatment for symptoms that are often not on offer from their GP or liver specialist.

Research into symptoms of hepatitis C, notably that currently being undertaken at Queensland University, is exciting and important for affected communities because it is shedding light on the different “clusters” of symptoms.

Further research to identify and describe the wide range of hepatitis C symptoms, how they relate to each other and what triggers them will deepen understanding of this complex medical condition and help doctors to identify, validate and treat symptoms.

Most importantly, it will greatly assist people living with the virus to understand and manage their condition, know they are not going crazy, and make informed decisions about treatment.
MY LIFE AS A DOCTOR WITH CHRONIC HEPATITIS C: THE PSYCHOSOCIAL IMPACT OF CHRONIC ILLNESS AND THE DEVELOPMENT OF RESILIENCE

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I will examine the psychosocial aspects of Chronic Hepatitis C from the perspective of a medical practitioner who has contracted Hepatitis C from a needlestick injury referring to: my experience as a patient in two failed attempts at antiviral therapy; discrimination; impact on career and resultant professional and social isolation; depression associated with loss of meaningful life purpose.

Discussion will include factors identified in US studies in patients with life-threatening illnesses who have long outlived their prognosis, such as: a commitment to living; sense of control; sense of connection and the challenge of making meaning within difficult circumstances. The author’s experience at the Petrea King Quest For Life Centre in Bundanoon NSW, which provides support and education for people with serious illness, reveals that these characteristics extrapolate powerfully in assisting people with trauma, loss, grief and chronic diseases such as Hepatitis C.

If patients can identify and manage the stresses in their lives that exacerbate their physical and psychological symptoms they will be better able to cope, and make meaning in their lives despite the daily grind of living with Hepatitis C.

The quality of resilience is examined with reference to the extensive psychological literature on the subject, including the nature of resilience and the characteristics of those who naturally possess it. I will elucidate the ways we can develop resilience in ourselves and facilitate its development in our patients through provision of a place for open expression of feelings, meditation and relaxation training, psychological education and lifestyle advice. I will suggest that such centres could be developed within hospitals to provide this kind of support for patients and staff, highlighting the fact that the ability to withstand adversity with hope, and to create new possibilities from setbacks, will benefit researchers, doctors, and patients alike in the quest to manage our present epidemic of Hepatitis C in Australia and our individual lives.

COMMUNITY PARTICIPATION IN THE MEDIA

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Over the years, the Hepatitis C Council of NSW has at times received requests from media personal for information or interviews on Hepatitis C related issues. The Hepatitis C Council recognises personal perspectives of living with hepatitis C as a powerful tool for raising awareness among the community and reducing stigma and discrimination. Despite this it has often been difficult to find members of the community who are able/willing to speak with the media, often at short notice.

In addressing this need, the Hepatitis C Council developed a project which would provide support and training to a group of people living with hepatitis C with an opportunity to have a voice within media. The media project allows the Hepatitis C Council NSW to efficiently and quickly respond to such requests and put the media in touch with hepatitis C positive people who are trained and willing to share their experiences and views.

The Hepatitis C Council understands the value of positive media exposure, and included in this project is the promotion of the media speakers service to relevant media and organizations/individuals who would benefit from such a service.

This paper will provide an overview of the Media Speakers Project from the perspective of the Hepatitis C Council NSW staff member responsible for the project, and from a participating media speaker.
PROVISION OF CARE TO HEPATITIS C POSITIVE INMATES IN NSW CORRECTIONAL CENTRES

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Corrections Health Service (CHS) is responsible for the provision of health services to persons in custody in New South Wales. There are more than 18,000 people annually who benefit from the organisation’s services.

There are clinics in 31 correctional centres, 11 periodic detention centres, two transitional centres, 8 police cell complexes, 14 court complexes and nine juvenile detention centres across New South Wales. The fulltime population is currently around 8,500. Twenty seven percent of people stay less than eight days, 17% eight to 30 days, and 56% longer than 30 days with only 10% longer than six months. Recidivism is high at about 69%.

The Inmate Health Survey (2001) showed that 64% of women and 40% of men are hepatitis C antibody positive. These people have complex health needs relating to co-infections, mental health and drug and alcohol issues. These clients are managed by a team of experienced sexual / public health nurses in collaboration with specialist hepatology services. There are specialist hepatitis clinics in 13 correctional centers across the state. Liver biopsies are performed on site at three centres and at local hospitals. To date over 30 clients have been commenced on antiviral therapy.

Providing these clients with optimal care presents many challenges. Potential movement of inmates to any correctional centre in the state makes follow up for specialist services, routine monitoring and management of side effects complex. Clearly, HCV is a significant health issue for inmates and CHS as a service provider. To improve and standardizes services and highlight areas for action CHS developed “Strategic Directions 2003-2006 – Prevention and management of hepatitis C in the NSW corrections system”. This document identifies these challenges and outlines directions for services to ensure equitable access to high quality care for inmates. This is complemented by the “Hepatitis Clinical Management Guidelines and Information Manual” which facilitates the delivery of best practice, standardised care to all clients with hepatitis C who are in the correctional system.

This presentation will identify the challenges to service delivery, demonstrate CHS’s response and describe the provision of service to hepatitis C positive inmates.
DEVELOPING THE CAPACITY OF THE ABORIGINAL HEALTH SECTOR TO DEAL WITH THE EXPANDING EPIDEMIC OF HEPATITIS C.

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In May 2003 the Hepatitis Council of WA in partnership with the Western Australian Aboriginal Community Controlled Health Organisation (WAACCHO), began an Indigenous Community Development Project to look at increasing the capacity of the Aboriginal Community Controlled sector to deal with the expanding epidemic of hepatitis C. The project was one of the first two projects specifically aimed at hepatitis C within the Aboriginal community of Australia.

The Indigenous Community Development Project aimed to develop a preventative response to the expanding hepatitis C epidemic in Western Australia. The project set about organising workshops about Hepatitis C and related issues with indigenous workers incorporating both metropolitan and regional workers. It was early into the project that it was found that the first priority was to get hepatitis C to be on the agenda in Aboriginal Health. It became apparent that the Aboriginal Community was absorbed in day to day crisis management of Aboriginal health and did not have the resources to look at preventing the social crisis that hepatitis C poses.

There is evidence that the epidemic is expanding at a greater rate in the Aboriginal community than the non-Aboriginal community. The situation in Aboriginal community of WA is that the rate ratio of Hepatitis C notifications has increased from 91 per 100 000 in 2000 to 143 per 100 000 in 2002. During the same period the rate ratio for Hepatitis C infections for non-Aboriginal West Australians has decreased from 34 per 100 000 in 2000 to 26 per 100 000 in 2002 (figures from the Western Australian Department of Health).

This paper will share the findings of Western Australia’s first Aboriginal Hepatitis C project. It will outline the challenges faced to raise awareness of hepatitis C and the need for prevention to be the primary message.

PREDICTORS OF COMPLETION OF A HEPATITIS B VACCINATION SCHEDULE AT A PRIMARY HEALTH CARE FACILITY IN KINGS CROSS, SYDNEY

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An effective vaccine has been available against hepatitis B virus (HBV) for over 20 years, however uptake is still suboptimal among injecting drug users (IDUs) . The Kirketon Road Centre (KRC) is a primary health care facility located in Kings Cross, Sydney which targets the health needs of IDUs and other populations potentially at risk of HBV. KRC commenced use of an accelerated HBV vaccination schedule in March of 1995 to maximise completion rates for this vaccine. In this study we examined rates and predictors of vaccine completion in attendees at KRC.

Demographic, vaccination and serological data were extracted from routinely collected data at KRC. Logistic regression analysis was used to determine predictors of completing the vaccination schedule within one year.

From 1992 to the end of 2003, 1413 KRC clients received their first HBV vaccination at KRC, 643 (46%) received a second vaccination and 375 (27%) received a third. Median time to HBV third vaccination was 137 days (range 9 days to 8.3 years). 1139 (81%) received an accelerated schedule. Predictors of vaccine schedule completion within a year included intention to administer an accelerated schedule (OR 1.46; p=0.05); not being an IDU (OR 1.33; p=0.05) and shorter time between a client’s first visit and first vaccination (p trend=0.0008). However upon multivariate analysis only time between a client’s first visit and first vaccination remained significant (p trend=0.02).

While a significant number of potentially high risk clients took up HBV vaccination, only a low proportion completed the full course despite methods to enhance vaccine completion such as the accelerated vaccine schedule. Catch-up HBV vaccination in early adolescence should be considered to improve HBV protection for individuals who subsequently engage in high-risk activities such as injecting drug use.
DEVELOPING THE SECOND AREA HEALTH PLAN – IDENTIFYING THE NEEDS AND GETTING COMMITMENT FROM A RANGE OF SERVICES

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CSAHS was one of the first Area health services to develop a multidisciplinary Hepatitis C Strategic Plan. It was launched in 1999 (prior to National and State Plans). By late 2002 most of the strategies had been implemented especially those related to treatment and care, the greatest obstacles were found in implementing the prevention strategies.

The development of second Strategic Plan began in early 2003. Compared to the previous Plan the development was much more complex as many more issues and challenges were identified. The development involved a review of the implementation of the previous Plan, a much wider consultation, a review of the literature, a review of other strategic plans and reports and formation of working groups. The Strategy focuses on 4 main Areas for Action – prevention/health promotion; treatment and care; discrimination; and surveillance and research.

Two working groups made up from representatives from related services were convened – one group focused on prevention/health promotion the other focused on treatment/care needs. Each group was asked to identify needs and develop strategy and commitment to meet the need. Consultations with NGOs were also conducted. A forum made up of a range of HCWs was conducted to identify strategies to reduce discrimination.

The major goal during the development phase was to build on partnerships, develop achievable strategies and strengthen the commitment from a range of services. The major hurdle was getting commitment in an environment where resources are limited.

This presentation will review the needs, strategies and commitment identified in the Plan.
IMMUNITY AGAINST HEPATITIS C IN HIGHLY EXPOSED POPULATIONS

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The immunological correlates of protection against the establishment of chronic HCV infection have not yet been clearly defined. It appears that cellular immune responses, including proliferative responses to non-structural proteins, production of IFN-γ and cytotoxic activity, may be important in the clearance of primary infection with HCV, but it is not known if these responses will protect against re-exposure to HCV.

We have examined this phenomenon of potentially protective immunity has been examined in three groups: high-risk, HCV seronegative, injecting drug users (IDU); multiply-transfused thalassaemic adults; and a prospective cohort of seronegative prisoners. In these cohorts we have investigated the hypothesis that individuals at high risk for HCV exposure have cellular immunity against HCV in the absence of antibodies and are protected against persistent infection. The presence of serum HCV-RNA was excluded by RT-PCR. HCV-specific peripheral blood mononuclear cells or liver-derived mononuclear cells were identified by ELISPOT for IFN-γ, cytotoxic T lymphocyte (CTL) and lymphocyte proliferation assays (LPA). The presence of low level HCV antibody responses was examined by recombinant immunoblot assay (RIBA).

In the IDU (n=38) and thalassaemic cohorts (n=26), HCV antibody negative subjects who demonstrated the following phenotype were identified: prominent HCV-specific IFN-γ ELSpot responses, CTL responses, CD4 LPA, and faint bands on RIBA (indicative of indeterminate serological status). High-risk uninfected IDU were more likely to be ELISPOT positive than lower risk individuals from the same IDU cohort (p=0.03) and demonstrated higher magnitude responses to the non-structural proteins (p=0.04). In the prison cohort, three subjects with prolonged, but transient, viraemia without seroconversion were identified. These individuals also demonstrated HCV-specific cellular immunity.

These findings suggest that these potentially protective cellular immune responses against HCV may be maintained by episodes of sub-clinical infection without seroconversion. Therefore vaccine strategies designed to mimic this response by eliciting cellular rather than humoral immunity may provide protection against persistent HCV infection.


DENDRITIC CELL VACCINATION STRATEGIES FOR HEPATITIS C VIRUS INFECTION

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It is estimated that around 80% of individuals who are infected with hepatitis C virus (HCV) develop a persistent infection that is usually lifelong. This is accompanied by the development of serious liver disease in a proportion of these individuals. The current best practice treatment for HCV infection is combination therapy with pegylated interferon and ribavirin that can eliminate the infection in approximately 50% of individuals. The rates of a sustained viral response is genotype-specific. However, this therapy is highly toxic and expensive, and patients need to be selected carefully. Consequently, addition antivirals are urgently required.

Among the many potential factors which influence the outcome of acute infection, it has been suggested that an impairment in the function of dendritic cells may contribute. This is consistent with the observation that specific MHC class II haplotypes clear acute HCV infection more effectively, suggesting that presentation through MHC II may be important for an effective HCV-specific immune response. Impaired dendritic cell function may be a major factor in the lack of expansion of the HCV-specific immunity, leading to persistence, as dendritic cells are the major antigen presenting cells capable of stimulating naïve T cells.

It may be possible to overcome this impairment in dendritic cell function by autologous transfection of HCV antigen-loaded dendritic cells prepared ex vivo. We have made some progress towards this goal and are currently optimising the ex vivo maturation of dendritic cells with HCV proteins or peptides. The immediate aim of the study is to prove safety and to determine if the autologous transfection will influence HCV immune responses in HCV-positive patients.
HEPATITIS C VIRUS-LIKE PARTICLES AS A VACCINE CANDIDATE FOR HEPATITIS C

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Because of the lack of an effective vaccine and less-than-optimal therapy in hepatitis C, novel approaches to induce HCV-specific immune responses may promise major advances in our effort to control the global health burden of this virus. We have previously reported the synthesis of HCV-like particles (HCV-LPs) using a recombinant baculovirus that contains the cDNA of the HCV structural proteins (core/E1/E2). These HCV-LPs have similar biophysical, ultrastructural and antigenic properties as the putative virions. Both BALB/c mice and HLA-A2.1 transgenic (AAD) mice immunized with HCV-LPs can generate strong and broad humoral and cellular immune responses against HCV structural proteins, which are protective in a surrogate challenge model using the recombinant vaccinia virus expressing core, E1 and E2. Here we further test the immunogenicity of HCV-LPs and the effects of novel adjuvant systems in non-human primates. Three groups of four baboons were immunized with HCV-LPs alone or HCV-LPs plus adjuvant, AS01B (monophosphoryl lipid A and QS21) or the combination of AS01B and CpG oligodeoxynucleotides10105. After four immunizations over a 6 month period, all animals developed HCV-specific humoral and cellular immune responses, in particular, antibodies to HCV structure proteins core and E1/E2, and virus-specific cellular immunity including CD4+ (by enzyme-linked immunospot assay for interferon-γ) and CD8+ (by intracellular cytokine staining for interferon-γ) responses. In addition, the immunogenicity of HCV-LPs was enhanced by the use of adjuvant AS01B and the combination of AS01B and CpG 10105. The overall HCV-specific immune responses were robust and long-lasting (>8 months). We are now immunizing chimpanzees with the optimal protocol developed from the baboon study and are testing the possibility of protective immunity upon challenge with HCV. Our results suggest that HCV-LP is a promising immunogen to induce HCV-specific immune responses and these adjuvants are potent immune enhancers for this approach, which may hold great promise in developing novel preventive and therapeutic modalities for hepatitis C.
WHAT ARE THE HEPATITIS C KNOWLEDGE AND ATTITUDES OF PEOPLE WITH HEPATITIS C?

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Health professionals often provide people with hepatitis C contradictory advice about the prognosis, treatment and transmission of the disease. Health professionals’ inadequate knowledge may influence the knowledge, and most likely the self-care practices, of people with hepatitis C. An analytical, cross-sectional survey was undertaken to explore the hepatitis C knowledge and attitudes of people with hepatitis C. A total of 176 questionnaires were distributed to members of the Hepatitis C Council of Victoria and patients attending liver clinics in Melbourne, Australia. A response rate of 62% (n=110) was obtained. Objectives of the questionnaire included identifying level of hepatitis C knowledge, attitudes towards health professionals, and experiences of hepatitis C-related discrimination. Health professionals were identified as the main source of hepatitis C information by 77% of participants. Eighty four percent considered themselves well informed about hepatitis C. However, 10% incorrectly believed that hepatitis C could be spread through close personal contact such as kissing, and a further 12% believed hepatitis C is commonly spread through blood contact. Twenty seven percent of participants believed they would die because of their hepatitis C and 18% were not aware hepatitis C is treatable. At the time of diagnosis, 57% were not provided with any hepatitis C information. Since diagnosis health professionals have given 31% of participants contradictory information about hepatitis C. A quarter of the sample felt pressured to disclose their hepatitis C status to health professionals. A further 30% felt that health professionals treated them differently after their hepatitis C status was revealed. Discrimination was defined as unfavourable treatment from a health professional, because they know or think an individual has hepatitis C, which results in reluctance to access health services. Twenty seven percent of participants reported being discriminated against by a health professional. Of these, 12% identified general practitioners as the discriminators. The results provide insight into the impact health professionals’ knowledge and attitudes have on the health care experiences and health-seeking behaviour of people with hepatitis C. The findings could influence education initiatives for health professionals and subsequently improve the quality of care provided for people with hepatitis C.

CLINICAL MARKERS AND LIVING WITH HEPATITIS C

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Liver function tests provide a primary clinical marker used to monitor the condition and functioning of the liver in the management of hepatitis C. Little is known about how people with hepatitis C respond to liver function test results, and the relationship between these results and adaption to life with hepatitis C as a chronic illness.

This report will focus on the effects of clinical markers on people with hepatitis C with regard to their health and physical state as well as their psychological state and lifestyle. In particular, we were interested in the impact of clinical markers test results on transitional processes in adaptation to living with hepatitis C as a chronic illness.

This report uses a sample of 36 participants, selected from the original, larger study. The complete study recruited 78 participants with various relationships to blood: ex and current IDU; blood donors; blood recipients; those with blood disorders; those with high occupational exposure to blood (ambulance officers); those with hepatitis C from means other than injecting drug use; and those who practice body modification. This analysis will focus on data from interviews with HCV positive individuals and their response to clinical markers such as Alanine Aminotransferase (ALTs) which are measured in liver function tests for hepatitis C.

Clinical markers generally appeared to have no or very little effect on participants. However, a small proportion of the participants were a little concerned with ALT results. It is possible that test results are more significant for people who are particularly ill, or where the disease is more advanced, because health is a primary concern. These participants may find it more important to follow the progress of the virus through the ALT results.

Typically, participants had little concern with the medical model of chronic illness as indicated in ALT results. The social consequences of living with hepatitis C, such as potential social limitations and isolation, were more significant and had greater impact on people with hepatitis C than clinical markers of disease progress.
SO WHAT'S THE BIG DEAL ANYWAY? HOW DO WE MAKE HEPATITIS C A PRIORITY AMONG ETHNIC-VIETNAMESE INJECTORS?

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Evidence shows that 50% of IDUs attending needle and syringe programs have been exposed to the hepatitis C virus (HCV). In 3 studies in Melbourne since 1996 involving Vietnamese IDUs at least 80% of participants in each study were HCV anti-body positive, which is a cause for concern when compared to other IDUs.

As part of a larger study examining blood borne virus (BBV) prevalence in ethnic-Vietnamese IDUs researchers spent 10 months in spaces where ethnic-Vietnamese IDUs congregated (largely in street-based drug markets across Melbourne) in order to engage and develop positive relationships with potential research participants.

Participants were questioned about their demographics, injecting behaviour; testing rates and knowledge of any BBV infection, access to health and community services, and their return to Vietnam. They were also asked to provide a venous blood sample, which was tested for HIV, HCV, and hepatitis B. Participants were provided with pre and post-test counseling. Where appropriate and possible, researchers provided case management to participants who tested positive, linking them to primary health care (PHC) providers and infectious disease specialists.

103 (81.1%) of the 123 study participants were HCV antibody positive of whom 90 (87.4%) were HCV PCR positive. Many of these IDUs had a limited knowledge about HCV and their personal HCV status. There was widespread ambivalence amongst participants about HCV, both prior to and following testing. Many assumed they and their associates were HCV positive and were not overtly concerned about their result. Few participants diagnosed as HCV positive wanted follow-up at tertiary health services. At the same time, the case workers had a number of successes in linking participants into local PHC centres. The paper will describe how health practitioners can work with this target group and develop real options for them to affect positive change and to limit the transmission of HCV and other BBVs.

HEPATITIS C KNOWLEDGE, BARRIERS AND ATTITUDES TO TREATMENT IN ACTIVE INJECTING DRUG USERS

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Despite recent improvements in hepatitis C treatment outcomes and current injecting being removed as an exclusion criterion for hepatitis C treatment in Australia, very few current injecting drug users (IDU) have access to treatment programmes. We therefore examined hepatitis C natural history and treatment knowledge, and barriers and willingness to access hepatitis C treatment among current IDUs.

A convenience sample of current IDU (n=100) with self-reported hepatitis C drawn from a primary health facility (Kirketon Road Centre) and methadone clinic (Rankin Court) in inner Sydney completed an interviewer-administered questionnaire.

Participants had a reasonable knowledge of hepatitis C natural history but very poor knowledge of hepatitis C genotypes and treatment outcomes and tended to over estimate hepatitis C disease progression. The majority believed that being a current IDU was an exclusion criterion for treatment and only 42% of participants believed that hepatitis C could be cured. Despite this, 70-86% reported that they would consider treatment under the following scenarios: requirement for liver biopsy, thrice weekly subcutaneous injections and common treatment related side effects. The proportion of participants who would consider hepatitis C treatment, based on treatment efficacy scenarios was (36%) for 20% efficacy, (63%) for 40% efficacy, and (93%) for 70% efficacy. Older participants and those on drug dependency treatment program had higher levels of treatment consideration. Knowledge of the impact of hepatitis C genotype on treatment duration and success was extremely low. Six percent of participants correctly answered which genotype responds best to treatment and 5% or less of participants knew the correct answer to the length of treatment required for each of the three main genotypes.

A high proportion of current IDUs appear willing to consider hepatitis C treatment. Further research needs to more clearly define current barriers to hepatitis C treatment access, and treatment programs need to be developed that specifically address the needs of current IDUs.
WOMEN’S PERCEPTION OF ANTENATAL SCREENING FOR HEPATITIS B AND HEPATITIS C VIRUS

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Few studies have sought to investigate women’s perception of antenatal screening for hepatitis viruses. This study aimed to identify antenatal testing practice, the provision and quality of information as perceived by antenatal women and the relationship of these factors to women’s demographic and risk factor history.

Women attending their first assessment during June 2002 to February 2003 were asked to complete a written questionnaire and consent to medical record review of serology results. Women were actively recruited once a week by a dedicated research nurse and on other days by antenatal clinic staff.

During the study period 95% and 99.6% of women were tested for hepatitis antibodies and hepatitis B surface antigen (HBsAg) respectively. Of these women, ~21% reported that they had declined antenatal clinician’s offer to be tested for hepatitis C virus (HCV) and/or hepatitis B virus (HBV) and ~8% of women reported being unaware if they had been tested. Women who reported being born in a country other than Australia (p=<0.001 for HCV, p=0.04 for HBV), offered testing by a midwife (p=0.003 for HCV, p=0.001 for HBV) or no prior hepatitis screening (p=0.001) were more likely to report having declined testing. Women who reported having a history of illicit drug use were less likely to decline testing (p=0.06 for HCV, p=0.05 for HBV). Close to 70% of women reported that they had received no pre-test HCV or HBV information. In addition, tested women who reported receiving information rated the quality of information poorly, mean value scored for HBV 1.2 and 1 for HCV (range =5).

In a setting of virtually universal HBV and HCV antenatal testing, a substantial minority of women reported having declined or being unaware of testing, and those who were aware of testing indicated that they had received little pre-test information. While the generalisation of these findings to others sites is not known the study suggests a need to review antenatal screening practice for HCV and HBV at a clinical level to ensure women receive adequate information and are provided the opportunity to give an informed consent.

WHO IS CALLING? ANALYSIS OF 8 YEARS OF CALLS TO A HEPATITIS C TELEPHONE INFORMATION AND SUPPORT LINE

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The NSW Hep C Helpline (Helpline) was established in 1991 and takes over 3000 calls a year, including those from the world’s first Prisons Hep C Helpline, launched in 2001.

Since 1994 the Hep C Helpline has collected caller data in order to monitor trends in relation to hepatitis C-related need for individuals and communities. This leads to the provision of appropriate information and resources and so meets the Helpline aim of providing accurate and up to date information and an appropriate level of support and referral. Data trends also inform the provision of Helpline volunteer worker training.

The findings reported in this paper constitute part of the analysis of data collected from 23,497 calls taken between July 1995 and June 2003. 39% of callers self-identified as being hepatitis C virus (HCV) positive; 22% of calls were made by partners, family or friends; and 14% were from health or welfare workers.

In addition to these 3 major identity groups, two sub-groups were selected for analysis: 1,757 callers who identified as injecting drug users (IDU), and 1,918 callers who reported being from non-English speaking background (NESB).

Seven composite variables were constructed to measure the topics discussed by callers. Significant differences were found for all topics between the three major identity groups.

Findings suggest different health promotion materials and activities should be developed to approach different groups regarding their interests, particularly HCV positive people and people who inject drugs. Increasing calls from NESB communities indicates that the Hep C Helpline is successfully reaching this sub-group.
SURGICAL RESECTION VERSUS TRANSPLANTATION IN THE TREATMENT OF HEPATOCELLULAR CARCINOMA

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Hepatocellular carcinoma (HCC) has an annual incidence of 4% in patients with HCV-associated cirrhosis. Surgical resection of early HCC in Childs A cirrhotics has shown comparable survival results to orthotopic liver transplantation (OLT). This study was performed to compare these two modalities in the treatment of early HCC.

A prospective HCC database has been maintained at RPAH since 1998. Of 235 patients with a 12-month minimum follow-up, 40 of 57 patients listed underwent OLT and a further 43 had surgical resection. Of the resection group, 13 without portal hypertension fulfilled criteria for OLT but underwent surgical resection (best surgical group). Outcomes were analysed by the Kaplan Meier method, with comparison by log rank test.

The median follow-up for the cohort was 42.5 months and HCV was the underlying cause in 39% of patients.

The overall survival for OLT was significantly better than for surgical resection (p = 0.018), but comparable on an intention-to-treat basis including all patients listed for OLT (p = 0.375). The best surgical subgroup had an excellent survival compared to the intention-to-treat OLT group (p = 0.015), however disease-free survival after surgical resection was inferior to OLT (p < 0.001). In resection patients, adjuvant I131 lipiodol in 18 patients led to improved disease-free (p = 0.038) and overall survival (p = 0.062).

Liver transplantation and surgical resection have comparable overall survival for early HCC, however disease recurrence is significantly higher following resection. Adjuvant treatment with I131 lipiodol may improve disease-free and overall survival in this group.
IMPROVEMENT IN TREATMENT OUTCOMES AMONGST HIV/HCV COINFECTED INDIVIDUALS TREATED WITHIN A TERTIARY HOSPITAL CLINIC SINCE 2000

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Recent international trials of pegylated interferon/ribavirin (PEGIFN/RBV) therapy for HIV/HCV have shown an improvement in treatment responses over standard IFN/RBV therapy but remain inferior to those in monoinfected patients. Clinical trial-based outcomes however may not be representative of clinical care-based outcomes. We therefore examined hepatitis C treatment outcomes among HIV/HCV coinfected patients within a tertiary clinic setting.

All HIV/HCV coinfected patients initiating therapy for hepatitis C infection through a dedicated viral hepatitis clinic since 2000 were included. 32 HIV/HCV patients have been treated, 10 with interferon-alfa/ribavirin (IFN/R), 1 with PEGIFN monotherapy and 21 with PEGIFN/RBV. Baseline characteristics: 97% male, mean baseline CD4 553 cells/mm³, mean baseline ALT 126 IU/L, 63% baseline HCV with PEGIFN monotherapy and 21 with PEGIFN/RBV.

Addition of telofovir (TDF) to HAART in HIV/HBV patients results in rapid early HBV DNA decline in HBV-treatment naïve and experienced subjects. Longer-term responses and the emergence of potential TDF-resistant mutations have not been clearly defined.

HIV/HBV (HBsAg +ve) patients treated with TDF-containing HAART were identified from a clinic database and clinical, demographic, antiretroviral details obtained. Serum samples frozen at ~70°C were retrieved and tested for HBV DNA using a realtime PCR assay (LLD < 500 c/ml). Sequence analysis of the polymerase gene was performed.

Seventeen HIV/HBV patients were identified: mean age 39.4 years, 100% male, 16/17 Caucasian, 76% MSM. Median HIV duration 14.4 years, median nadir/current CD4: count 88/227 cells/mm³; prior AIDS 57%. 14/17 patients were Lamivudine (LAM)-experienced (median duration LAM 37 months), 3 initiated TDF + LAM therapy.

Virological outcomes after tenofovir administration for HIV/HBV coinfection

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All patients were HBV viraemic pre-TDF: median HBV DNA 8.74 log₁₀ (naïve 9.6 log₁₀, LMV experienced 8.0 log₁₀). 6/8 tested had YMDD mutations at baseline consistent with LAM resistance. During TDF therapy, median ALT level (56 to 48 IU/L), bilirubin (24 to 18), and platelet count (85 to 101) did not significantly alter, however, albumin increased (34 vs 38)(p=0.039). All patients had reductions in HBV DNA after TDF: median change 4-12 weeks (-4.2 log₁₀), 12-24 weeks (-4.7 log₁₀), and 24-36 weeks (-4.7 log₁₀), and 36-86 weeks (-3.8 log₁₀). All patients suppressed to <10⁶ copies/ml and 7 to <500 copies/ml (complete suppressors). Median baseline HBV DNA in complete suppressors was 6/8 (7.2 log₁₀ vs 8.9 log₁₀) (complete suppressors).

Conclusion: Hepatitis C treatment results in significant HBV VL suppression within the initial 24 weeks of therapy regardless of prior therapy. However, complete HBV suppression to < 500 c/ml does not necessarily occur with further follow-up, and most patients experience a stabilisation of HBV DNA to between 500 and 20,000 copies/ml (4.3 log₁₀). Although this level of viral suppression may be clinically relevant with regards to continued seroconversion to anti-HBe and reduction in liver disease progression, this low-level viraemia provides potential for the development of HBV TDF-resistance and requires ongoing surveillance.

CD4 count fell on average 150 cells/mm³ by treatment end but by 6 months post treatment was similar to baseline (mean CD4 at SVR assessment 528 cells/mm³). Median ALT at SVR assessment was 36 IU/L (21-203) with normalisation in 53%.

During therapy 5 patients required ribavirin dose reduction (all on > 800 mg/daily) and 5 required PEGIFN dose reduction. 4 (13%) patients discontinued therapy due to toxicity: 1 mania, 1 nausea and 2 for progression to Childs B cirrhosis. Antidepressants were prescribed in 18 (58%) of patients, 13 of which were begun during treatment.

Conclusion: Hepatitis C treatment results in significant HBV VL suppression within the initial 24 weeks of therapy regardless of prior therapy. However, complete HBV suppression to < 500 c/ml does not necessarily occur with further follow-up, and most patients experience a stabilisation of HBV DNA to between 500 and 20,000 copies/ml (4.3 log₁₀). Although this level of viral suppression may be clinically relevant with regards to continued seroconversion to anti-HBe and reduction in liver disease progression, this low-level viraemia provides potential for the development of HBV TDF-resistance and requires ongoing surveillance.
DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF PATIENTS PRESENTING TO A TERTIARY LIVER CLINIC: WHAT DIFFERENCE A DECADE MAKES

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Community awareness, knowledge and understanding of chronic hepatitis C (CHC) is assumed to have substantially improved. We sought to determine whether these changes have impacted on the demographic and clinical characteristics of persons presenting to a tertiary hospital-based liver clinic in Western Sydney. Characteristics of 250 consecutive patients with CHC who underwent liver biopsy (Aug 1987 - Oct 1992) were compared to a cohort (n = 250) assessed a decade later (July 2000 - Nov 2003). Age at liver biopsy, gender, place of residence, fibrosis stage, risk factor for HCV acquisition, duration of infection, past alcohol usage, HCV genotype and country of birth were obtained on all subjects.

Persons residing in the Western Sydney Area Health Service district comprised 24% of the early, but 59% of the recent cohort (p=0.001). The distribution of fibrosis scores among early and recent cohorts, F0/1 (24% vs 50%), F2 (34% vs 29%), and F3/4 (42% vs 21%) respectively, was significantly different ($\chi^2$, p<0.001). The cohorts also differed in distribution of risk factors for HCV acquisition (injecting drug use [IDU]: 44% vs 57%; blood transfusion: 26% vs 14% ($\chi^2$, p<0.001)), and in the duration of infection (mean 13 yr vs 19 yr, p<0.001). For the initial population, 46% reported nil or minimal (<10 g/day) past alcohol usage, compared with 32% of the latter group. Corresponding rates for mild (10-40 g/day) and moderate-heavy (>40 g/day) past alcohol consumption were 17% vs 28%, and 37% vs 40%, respectively ($\chi^2$, p<0.001). There were no difference between cohorts with respect to age at biopsy (42 yr vs 41 yr), gender (male: 66% vs 68%), HCV genotype (type 1: 51% vs 52%; type 3: 31% vs 36%), or country of birth.

CHC is currently being diagnosed and assessed at an early stage of fibrosis, despite a longer average duration of infection. IDU is a more frequent mode of acquisition, and the level of past alcohol usage is greater in the recent cohort. More persons with CHC appear to be accessing local hepatitis C services. These data are consistent with increasing community and physician awareness, and referral for assessment, of persons with CHC.

THE IMPACT OF INTERFERON-BASED THERAPY ON NEUROCOGNITIVE FUNCTION AND HEALTH-RELATED QUALITY OF LIFE IN CHRONIC HEPATITIS C

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The aim of this study was to examine the impact of interferon (IFN)-based therapy on neurocognitive function and health-related quality of life (HRQOL) in chronic hepatitis C.

A cohort of HCV monoinfected and HIV-HCV coinfected individuals underwent neurocognitive function and HRQOL assessments including Trail Making Tests (TMT), a computerised test, Depression Anxiety Stress Scale (DASS), The National Adult Reading Test, the SF-36 Health Survey and Visual Analogue Scale (VAS) prior to, during and following pegylated IFN alfa-2a and ribavirin combination therapy. Thirteen HCV monoinfected and 14 coinfected individuals have been enrolled to date. Week 18 on-treatment follow-up data was available for 10 coinfected and five HCV monoinfected individuals. Comparison between the two groups and pre- and on-treatment neurocognitive function and HRQOL scores were carried out using MANCOVA and Student's t test.

The mean ($\pm$SD) age of HCV monoinfected and coinfected groups were 43.3 ($\pm$6.5) and 35.9 ($\pm$7.6) years respectively (p=0.01). Both groups had similar IQ levels. The median (IQR) CD4 count of the coinfected group was 368 cells/µL (328-585 cells/µL). Prior to IFN-based treatment, both mean TMT A and B scores were higher among HCV monoinfected (35.7 and 80.5 sec respectively) than coinfected group (28.7 and 67.5 sec), however the differences were not statistically significant after adjusting for age, sex and education level (p=0.4 and 0.2 respectively). The age- and sex-adjusted mean SF-36 and VAS scores measuring HRQOL and DASS scores were similar between the two groups. At week 12 on-treatment, HCV-RNA was undetectable in all coinfected compared to three of five HCV monoinfected group. At week 18 on-treatment, there were no significant changes in TMT scores from baseline in both groups, however, mean VAS and SF-36 scores declined in both groups but significant differences were found in five of the eight domains of SF-36 in the coinfected group. On-treatment mean DASS scores increased from pre-treatment levels in both groups with significant changes among the coinfected group.

Preliminary results showed that there was no evidence of greater neurocognitive and HRQOL impairments in HIV-HCV coinfection than HCV monoinfection at baseline. HRQOL worsen during IFN-based treatment in both groups. Further examination of neurocognitive function and HRQOL associated with sustained viral clearance will be undertaken.
HEPATITIS C VIRUS GENOTYPES: DETERMINATION OF UNUSUAL GENOTYPES AND RESPONSE TO THERAPY

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The most common genotyping method used in Australia is the Line Probe Assay (Innogenetics LiPA 11), a reverse phase hybridization assay, which relies on subtle nucleotide differences in the 5' untranslated region of the hepatitis C virus (HCV) genome to discriminate between genotypes and subtypes. Normally, the genotype can be determined by comparing the pattern of bands on the LiPA strip to the template provided. However, on occasions the banding pattern produced does not conform to any patterns on the reference template. We have taken a number of such samples and amplified the relatively conserved HCV core region by RT-PCR and sequenced the product. We show that in most cases this is sufficient to determine the correct HCV genotype. A further deficiency of the LiPA is the inability to distinguish the South East Asian (SEA) genotypes 7, 8 and 9 because they have an identical 5' UTR as genotype 1b, and are thus mistyped by this method. We investigated strains isolated from SEA patients living in Australia by genotyping and sequencing of the HCV core region. Sequence analysis was able to distinguish true 1b infections from the genotypes 7-9. A retrospective analysis of treatment outcomes of a subgroup of the SEA patients from an Australasian multicentre trial showed that the sustained virological response rate (SVR) for Caucasian patients with genotype 1b infection was low compared to those patients infected with genotypes 7, 8 or 9. If the outcome of SEA patients with genotype 6 was combined with that of patients with genotype 7, 8 and 9, the overall SVR was 83%. This high SVR suggests that the shorter treatment regime used for genotypes 2 and 3 may be more appropriate and this is to be investigated in a prospective trial.
THE NEW ZEALAND HEPATITIS B SCREENING PROGRAMME: SCREENING COVERAGE, FINDINGS AND KEY LEARNINGS

Bullen C R\textsuperscript{1}, Robinson T\textsuperscript{2}, Hughes W\textsuperscript{3}, Hornell J\textsuperscript{3}, Moyes C\textsuperscript{3}

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Between 1999 and 2002 the Hepatitis Foundation of New Zealand and the Northern Region Hepatitis Consortium undertook screening for hepatitis B infection among adult members of ethnic groups (Maori, Pacific and Asian people) with known high prevalence rates of chronic hepatitis B virus (HBV) infection. Almost 177,000 people were tested, around 27% of the eligible population at the 2001 census, with highest coverage among women (29%) and Pacific people (35%). Almost 6% of participants tested HBsAg positive (10,176 individuals) but there were significant ethnic group, sex and regional differences in exposure and carriage rates. Within Pacific and Asian groups there was significant variation in carriage, from 13% among Tongans to less than 0.5% among Indians.

Follow-up after screening included offering non-immune participants free hepatitis B vaccinations and arranging ongoing surveillance tests for people with chronic disease. The former was particularly challenging, with disappointing levels of vaccination course completion overall, and there were ethnic group differences in coverage.

In addition to presenting the results of the screening programme and the extent of coverage of screening and vaccination, the paper explores the challenges presented by such large-scale community HBV screening, comparing models of delivery and follow-up for people from populations typically regarded as ‘hard to reach’ by the primary care and public health services, and identifying key lessons learned.

PREVALENCE OF HBSAG MUTANTS AND IMPACT OF HEPATITIS B INFANT IMMUNISATION IN FOUR PACIFIC ISLAND COUNTRIES

Locarnini S\textsuperscript{1}, Basuni A\textsuperscript{2,3}, Butterworth L\textsuperscript{4}, Cooksley G\textsuperscript{4}, Carman W F\textsuperscript{3}

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The prevalence rate of hepatitis B virus (HBV) infection in Pacific Island countries is amongst the highest in the world. Hepatitis B immunization has been incorporated into national programmes at various times, often with erratic supply and coverage, until a regionally co-ordinated programme, which commenced in 1995 ensured adequate supply. The effectiveness of these programmes was recently evaluated in four countries, Vanuatu and Fiji in Melanesia, Tonga in Polynesia and Kiribati in Micronesia. That evaluation established that the programmes had a substantial beneficial impact in preventing chronic hepatitis B infection (Wilson et al. 2000 Vaccine; 18:3059). Several studies of hepatitis B vaccination programmes in endemic countries have identified the potential significance of surface gene mutants as a cause for failure of immunisation. In the study outlined in this paper, we screened infected children and their mothers for the emergence and prevalence of these variants in specimens collected from the four country evaluation. Although the opportunity for the emergence of HBV vaccine escape mutants in these populations was high due to the presence of a considerable amount of the virus in the population and the selection pressure from vaccine use, there were no “a” determinant vaccine escape mutants found. This suggests that vaccine escape variants are not an important cause for failure to prevent HBV transmission in this setting. Other HBsAg variants were detected, but their functional significance remains to be determined. The failure to provide satisfactory protection during such immunisation programs reflects the need for achieving and sustaining high vaccine coverage, improving the timeliness of doses as well as improving ‘cold-chain’ support, rather than the selection of vaccine-escape mutants of HBV.
Co-infection with HIV and either hepatitis B virus (HBV) or hepatitis C virus (HCV) is common. Following the introduction of antiretroviral therapy (ART), liver-related mortality now accounts for over 50% of deaths in HIV-infected individuals. The natural history of HBV and HCV is significantly altered by HIV co-infection. Both HBV-HIV and HCV-HIV co-infection are characterised by increased HBV and HCV viral loads, reduced necroinflammatory activity but enhanced fibrosis and progression to cirrhosis. The initiation of ART in HBV-HIV and HCV-HIV co-infected individuals has been associated with worsening liver function, presumed secondary to immune reconstitution and an aberrant HBV or HCV-specific immune response. Both chronic HBV and HCV infection (in the absence of HIV infection) are characterised by low HBV- and HCV-specific T-cell responses respectively, while clearance of both HBV and HCV is associated with a strong and multi-specific T-cell response. We have recently developed an overlapping peptide library to comprehensively evaluate HBV-specific T cell responses following the initiation of HBV-active ART. We identified a broad and multi-specific HBV-specific CD8+ T-cell response but markedly reduced HBV-specific CD4+ T cell responses. These findings may have a significant impact on the capacity for long term clearance of HBV and/or HBV immune escape. HBV-specific T cell responses may also play a significant role in disease flares. The understanding of direct virus-virus interactions in disease pathogenesis has been restricted by the lack of good in vitro models for HBV and HCV infection. Precipitants for hepatocyte apoptosis, Kupffer and stellate cell activation and associated immunosuppression, may all be important in the pathogenesis of accelerated fibrosis and liver disease progression in HIV-HBV and HIV-HCV co-infection.
HEPATITIS B AND MĀORI HEALTH

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Hepatitis B is a significant cause of morbidity & mortality for Māori in New Zealand. Māori also experience excess morbidity & mortality when compared with Pakeha (European) New Zealanders. This presentation will describe the impact of Hepatitis B on Māori and discuss a strategy for effective intervention. In particular, the paper will discuss the screening programme undertaken by the Hepatitis Foundation of New Zealand and the appropriateness of hepatitis control in the context of the government’s whānau ora strategy.

THE HEPATITIS C RESPONSE AMONG INDIGENOUS AUSTRALIANS

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The Indigenous Australian Community has a limited capacity to respond to the emerging epidemic of hepatitis C as an additional chronic illness. Most resources are already committed to other chronic illnesses such as diabetes or into basic infrastructure issues such as housing. The HIV/AIDS, viral hepatitis and sexually transmissible infections in Australia Annual Surveillance Report in 2003 indicated that of all newly diagnosed hepatitis C infections where racial status is reported approximately 10% were Indigenous. This indicates that Indigenous Australians have a new emerging epidemic to deal with.

Prisons are a concerning factor in this epidemic and may even be seen as an incubator for the virus. The situation in Western Australian prisons is that hepatitis C prevalence is estimated to be between 30% and 35%. It is also estimated that 1 in 3 Aboriginal men will spend time in custody over the period of their life. This gives two of the important factors in the transmission of a blood-borne virus (BBV).

The third factor in BBV transmission is an infection route. It is though that many Indigenous people are taught how to inject whilst in custody or by someone who had been injecting whilst in custody. Injecting in prison is possibly the worst environment to learn how to inject - not just due to the lack of availability of sterile injecting equipment or hepatitis C prevalence - but the peer culture that this develops for continued unsafe injecting practices that are then passed into the community.

There is work already being undertaken to address hepatitis C issues in the Indigenous community such as in Victoria and Western Australia were they are conducting training session for Aboriginal Health Care Workers. Mr Tony McCartney, the Chairperson of the National Aboriginal Community Controlled Health Organisation, has show national leadership on hepatitis C issues and has encouraged more Aboriginal Health Services to form partnerships and begin addressing hepatitis C and injecting issues in their communities. This paper will look at the challenges and what Hepatitis Council’s, Substance User Groups and Aboriginal Health Services and other organisations can do to help address the emerging epidemic.
ENHANCING HEPATITIS C TREATMENT AND CARE IN PRISON POPULATIONS

Lloyd A, Haber P, Levy M on behalf of Hepatitis Group of the NSW Corrections Health Service, NSW, Australia

Hepatitis C infection is the most prevalent blood borne virus infection amongst NSW prisoners with approximately half of all inmates infected. This striking prevalence is largely due to the high rate of this infection amongst injecting drug users and incarceration for drug related crimes. In addition, prisons provide a high risk environment for ongoing transmission via a range of blood-to-contacts, including sharing of injecting apparatus, tattooing, and fights.

In collaboration with hepatologists from around NSW, the Corrections Health Service (CHS) has established an integrated service for assessment and management of inmates with chronic hepatitis C. A voluntary screening program for blood borne communicable diseases at induction targets high risk inmates for testing and education. Protocol driven follow-up of inmates with chronic HCV by the public health nurses provides initial evaluation, triage and then referrals to a network of eight specialist hepatitis clinics. Selected inmates undergo liver biopsy and combination anti-viral treatment. Structured follow-up of those on treatment is also undertaken by the public health nurses.

In the decade since its inception, the hepatitis service has grown steadily with over 1000 clinic attendances between 1994 – 2000 and over 100 treatments initiated. A systematic review of the service and the outcomes of these treatments is currently underway.

Despite these advances, many challenges remain in implementation of better prevention and management programs for inmates with chronic HCV. Although initiatives for education of the CHS workforce have been put in place, more needs to be done to facilitate wider recognition and prioritisation of chronic HCV as a health problem. The hepatitis clinics currently service only a very small proportion of eligible inmates with chronic HCV, with only a minority of those individuals ultimately receiving treatment. Access to ultrasound and liver biopsy in the prison setting remains problematic. Continuity of care is continually jeopardised by the custodial imperatives.

Despite the substantial logistical challenges of providing sophisticated health care in the prison setting, provision of hepatitis services to inmates with chronic HCV is feasible and likely to be worthwhile.
Persistent virus replication is a hallmark of HCV infection. Our studies are focused on defining the virus and host processes that support persistent HCV RNA replication. We have found that efficient HCV RNA replication is associated with a viral-imposed blockade in host signaling events that induce the activation and effector function of IRF-3, a cellular transcription factor that initiates the antiviral state in the infected cell. Using viral-genetic and biochemical approaches we found that the protease function of the HCV NS3/4A complex was both necessary and sufficient to block virus-induced IRF-3 phosphorylation and activation. We therefore assessed IRF-3 function and the antiviral response within Huh7 cell lines harboring genetically distinct HCV RNA replicon variants. Efficient HCV RNA replication was associated with a block in virus-induced IRF-3 activation. In contrast, the low level replication of a replicon variant with protease domain mutations in the NS3 coding region was associated with a basal level of IRF-3 activation and induction of IRF-3 target gene expression. Thus, HCV RNA replication has the capacity to induce the host IRF-3 response pathway. To identify HCV agonists of the IRF-3 pathway we characterized IRF-3 activation in cells transfected with HCV RNA or viral protein-coding constructs. In control Huh7 cells double-stranded regions of the HCV genome specifically induced the activation of IRF-3 and the IRF-3-dependent expression of interferon beta and ISG56, but this response was blocked in cells expressing the viral NS3/4A protease. IRF-3 activation by viral RNA was disrupted in cells that exhibited increased permissiveness to HCV RNA replication. Moreover, we found that the permissive cells failed to signal the activation of IRF-3 and production of interferon beta upon infection with Sendai virus or vesicular stomatitis virus, each of which are potent IRF-3 activators. Our studies demonstrate that HCV can induce IRF-3 activation in an RNA-dependent manner, and identify the HCV NS3/4A protease as an antagonist of the host IRF-3 pathway. Thus, IRF-3 function is an important determinant of cellular permissiveness to HCV replication. The NS3/4A-IRF-3 interface represents an attractive target for therapeutic approaches aimed at restoring innate immunity to HCV infection.

The aim of this study was to compare intrahepatic gene expression in liver biopsies from patients with chronic HCV infection who have different levels of portal inflammation, insulin resistance (IR) and tissue fibrosis. Levels of gene expression were correlated with these levels of injury.

Novel gene expression was identified that correlated with each of the identified processes. For example portal inflammation was best correlated with CTXL, BAP29 and a transcript associated with interferon alpha resistance. IR was associated with 1L7R expression but a negative association was seen with expression of the Leptin Receptor. Fibrosis stage was best correlated with claudin 10, VEGF, Protocadherin 68 and CD48 expression.

At the transcriptome level, progressive injury in chronic HCV infection is characterized by novel gene expression that has identified new pathways that may be implicated in these processes. Current experimentation is comparing such gene expression between genotype 3 and 1 patients as well as linking correlations between inflammatory, IR and fibrosis pathways.
DEVELOPMENT OF CHIMERIC HEPATITIS B VIRUS-LIKE PARTICLES FOR THE DELIVERY OF FOREIGN EPITOSES DERIVED FROM HEPATITIS C VIRUS

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Hepatitis C virus (HCV) infects about 3% of the global population causing both acute and chronic infections however an effective vaccine has yet to be developed. Studies in chimpanzees have shown that anti-HCV antibodies directed against the hypervariable region 1 (HVR1) can protect chimpanzees from HCV infection. This suggests that antibody to HVR1 is desirable for protection against HCV infection and should be included in vaccine candidates.

Hepatitis B virus (HBV) surface protein (HBsAg) assembles into virus-like particles (VLPs) that elicit strong antibody responses in vaccinated humans. The exposed ‘a’-determinant region of the HBsAg can accommodate foreign epitopes that are highly immunogenic in mice. In this study recombinant HBV VLPs were used to deliver HCV-specific HVR1 sequences in the ‘a’-determinant region of HBsAg. The chimeric VLPs were highly immunogenic inducing anti-HVR1 antibodies in mice. Preliminary data show that serum derived from mice immunised with chimeric VLPs containing the HVR1 sequence derived from H77 clone of HCV was able to block entry of H77c E1E2 pseudotyped HIV-1 particles into target cells. The HVR1 epitope inserted into HBV VLPs elicits strong antibody responses in mice and has potential as a vaccine candidate. As HBsAg is already used as a vaccine against hepatitis B, its modification for the delivery of HCV epitopes will result in a vaccine candidate that is well understood by manufacturing and regulatory bodies.

IDENTIFICATION OF A HYDROPHOBIC HEPTAD REPEAT IN THE MEMBRANE-PROXIMAL REGION OF HCV E2 NECESSARY FOR E1 AND E2 HETERODIMERIZATION AND VIRAL ENTRY

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HCV is a member of the Flaviviridae family and encodes two glycoproteins, E1 and E2, that can mediate low pH dependent viral entry into hepatic cells when pseudotyped into retroviruses. The mechanism of viral fusion for HCV is unknown but may parallel that of its distant relatives, the flaviviruses. The flavivirus, tick borne encephalitis virus (TBEV) contains two envelope proteins prM and E that form heterodimers. After receptor binding, the virus is internalized and the low pH environment of the endosome triggers fusion of the viral and cellular membranes, leading to entry. TBEV glycoprotein E fusion activation involves the conversion of E dimers into highly stable trimers that is mediated by the stem region connecting the ectodomain to the transmembrane domain. The stem region of E contains a conserved hydrophobic heptad repeat essential for heterodimerization of E with prM and in dimer-trimer transition after low pH activation. We have identified a highly conserved heptad repeat, residues 675-699, linking the soluble ectodomain of HCV E2 (residues 384-661) to the transmembrane domain (716-746). Alanine and proline scanning mutagenesis of the E2 heptad repeat revealed that Leu675, Ser 678, Leu 689 and Leu 692 are important for E1-E2 heterodimerization. Furthermore, Pro- and Ala-substitution of all but one heptad repeat residue (Ser678) blocked the entry of E1E2-HIV-1 pseudotypes into Huh7 cells, irrespective of an effect on heterodimerization. Two conserved prolines (Pro676 and Pro683), occupying consecutive positions of the heptad, were not required for E1-E2 heterodimerization, however, Pro683 was critical for viral entry. Thus, disruption of the predicted α-helical structure by proline at position 683 is important for E2 function. The inability of mutants to mediate viral entry was not explained by a loss of receptor-binding function, as all mutants were able to interact with a recombinant form of the CD81 large extracellular loop. Our data indicates that the membrane-proximal heptad repeat of E2 is functionally homologous to the stem of flavivirus E glycoproteins. We propose that E2 has mechanistic features in common with class II fusion proteins.
ALCOHOL METABOLISM ENHANCES HCV REPLICATION IN VITRO

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Recent clinical studies have shown that both hepatitis C virus (HCV) and alcohol consumption act synergistically to enhance the inflammatory and fibrogenic response of the liver during chronic HCV infection. The precise mechanism of this synergy and the molecular mechanisms responsible for disease progression are unclear; however, clinically there is evidence that alcohol consumption can lead to a direct increase in HCV replication. The aim of this study was to examine the effect of alcohol metabolism on HCV replication in vitro and to determine its effect on hepatocyte viability and the anti-HCV action of interferon alpha (IFN-α).

Stable Cytochrome P4502E1 (CYP2E1) transfectants were generated in Huh-7 cell lines harbouring either the sub-genomic or genomic HCV replicons as parental Huh-7 cell lines lack alcohol metabolising enzymes. HCV replication was monitored using Real Time PCR and reactive oxygen species (ROS) production was assayed by DCFDA and flow cytometric analysis.

Expression of CYP2E1 and HCV replication in the presence of physiological concentrations of ethanol (10-100mM) was not toxic to Huh-7 cells. However, HCV replication was significantly increased in the presence of CYP2E1 and treatment with ethanol (2-3-fold), an increase not observed in cell lines lacking CYP2E1 expression. In the presence of ethanol, H7-2E1/HCV cells showed an increase in ROS production compared to cells without ethanol. Interestingly, treatment of H7-2E1/HCV cells with the anti-oxidant n-acetyl cysteine (NAC) restored HCV replication to baseline. Finally, alcohol was found to negatively interfere with the IFN-α induced reduction of HCV RNA levels in H7-2E1/HCV cells.

The results obtained from this study suggest that HCV replication and alcohol metabolism in Huh-7 cells results in an increase in ROS production and HCV replication. Furthermore, blocking ROS production in this model system restored HCV replication to baseline suggesting that HCV replication may be positively enhanced by low level ROS production. This increase in ROS production in the HCV infected individual who consumes alcohol may enhance disease progression through increasing levels of HCV replication and modulation of cellular gene expression ultimately resulting in stellate cell activation and fibrogenesis. Furthermore, alcohol metabolism may negatively impact on the anti-viral actions of IFN-α.

GBV-B INFECTION IN THE MARMOSET; A SURROGATE MODEL OF HCV

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GB virus-B (GBV-B) was proposed as a surrogate model for HCV and causes an acute self-limited hepatitis in naïve tamarins. Phylogenetic analysis and the genome organisation of GBV-B suggest that this virus also belongs to the Hepacivirus genus of the Flaviviridae. To examine their susceptibility, we inoculated 6 marmosets with GBV-B positive serum.

Two animals were inoculated with tamarin-derived GBV-B-positive serum and the course of infection examined. Consequently, 4 animals were inoculated with GBV-B-positive serum derived from one of these marmosets. GBV-B RNA was quantified by a real time one-step RT-PCR. GBV-B anti-core in the serum was determined by immunoblot using purified recombinant core protein. ALT levels were measured at weekly intervals. Liver tissue from marmoset F685 was taken at 12 weeks post-inoculation.

One week after challenge, F934 became viraemic with a viral load of 4 x 1010 - 9.5 x 1010 genome copies/ml that lasted for 2 weeks. The ALT level rose and peaked after 5 weeks. The anti-core antibody became positive after 6 weeks and reached a plateau at 9 weeks post infection. Another animal F885 showed no signs of infection. Inoculum derived from F934 was used to inoculate 4 marmosets by the intravenous or intra-peritoneal route. All animals became viraemic after one week and virus titre fluctuated from 106 to 108. The ALT level peaked around 5 weeks later. The animals were still viraemic at 15 weeks post-infection and an histological analysis of the liver of one animal at 12 weeks post-infection showed an ongoing hepatitis and steatosis, similar to that in HCV-infected human liver.

The common marmoset, Callithrix jaccus, breeds well in captivity and is not endangered. Marmoset-derived GBV-B showed consistent infection rates and replication profiles in our marmosets. The infection model of GBV-B established in our laboratory permits further in vivo and in vitro studies for the successful validation of HCV antiviral agents.
STRATEGIC DIRECTIONS FOR AUSTRALIA’S RESPONSE TO HEPATITIS C

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Australia leads the international community in having developed a ‘world-first’ National Hepatitis C Strategy that established an important foundation for action to guide the national response to the hepatitis C epidemic.

The National Hepatitis C Strategy 1999-2000 to 2003-2004 was reviewed in 2002. The Review found that the Strategy had established a good foundation for action and contributed to an increased awareness of hepatitis C as a serious public health problem.

A second National Hepatitis C Strategy is currently under development in partnership with key stakeholders. The development of the new Strategy is aimed at revitalising Australia’s response to hepatitis C through maintaining the successful foundations of previous Strategy while responding to emerging priorities.

The new National Hepatitis C Strategy 2003-04 to 2005-06 will draw from the recommendations of the 2002 Review and the associated Australian Government Response. This paper discusses both the processes behind the development of the new Strategy and the key priorities currently under consideration.
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POSTER ABSTRACTS
**P1 DEVELOPMENTS IN PEER EDUCATION IN NEW ZEALAND**

Jang W1, Brown R V2
1Hepatitis C Resource Centre Te Waipounamu; 2Hepatitis C Resource Centre Te Ika a Maui

Over the last year or two, the Christchurch-based Hepatitis C Resource Centre has been developing extensive peer networks throughout the South Island. Manager, Bill Jang has been instrumental in obtaining the funding, driving the project, developing the resources and doing the hands-on training. He will talk about the project, his training programme and his successes.

With 75% of the population in the North Island, greater competition for funding dollars, and a different contract with the Ministry of Health, the Auckland-based Resource Centre is a little behind the eight-ball in comparison with Christchurch. However, a training programme is in place and Robyn Brown will take the opportunity to share the Peer Educator’s Handbook with the community at the end of the presentation. The Auckland group works extensively with people in prisons and is keen to see effective peer networks in that environment as well as the community at large.

**P2 HEPLINK: A WORKFORCE DEVELOPMENT PROJECT**

Cairnduff S1, Murphy G2
1Hepatitis C Council of NSW, Sydney, Australia; 2Hunter Area Health Service, Sydney, Australia

In NSW specific training, skills building and networking opportunities for hepatitis C workers is a key element to addressing the epidemic. Using the principles of the “Capacity Building Framework” developed by NSW Health, a collaborative workforce development project called HepLink aims to enable workers to respond better to hepatitis C issues through developing a collaborative, informed, supported and resourced workforce. HepLink uses a model based on a multidisciplinary approach, with a strong emphasis on effective and sustainable learning activities.

HepLink is open to all NSW based health and other workers who are interested in or affected by hepatitis C. HepLink aims to facilitate networking, provide a forum to address issues of common concern and enable workers to share information and resources. Membership of HepLink includes access to face to face meetings based in Sydney and an email listserv component. Meetings are interactive and structured around issues identified by members. Meetings and activities are organised by the HepLink steering committee, a multisectoral and multidisciplinary team drawn from the membership. The Hepatitis C Council of NSW acts as the secretariat for HepLink.

In this presentation, we aim to demystify the Capacity Building Framework used by the HepLink Steering Committee to guide our work, and discuss ideas for its application to the challenging issues facing the hepatitis C workforce. We will do this by drawing on the examples of HepLink activities that demonstrate applications of the principles of capacity building. We will also discuss new strategies used by the steering committee to access the diverse hepatitis C workforce.
P3
EXPLORING THE NEED FOR HEPATOLOGY NURSES AND ALLIED HEALTH PROFESSIONALS IN VICTORIAN LIVER CLINICS

Ehsani J P1, Vu T1, Karvelas M1
1Communicable Disease Section, Public Health Group, Department of Human Services, VIC, Australia

This study examined the need for hepatology nurses and allied health professionals to meet the current and anticipated challenges of increasing numbers of people seeking treatment for hepatitis C. Key informant interviews and focus groups were employed as the research methods for this qualitative study. The key informants included directors of Victorian liver clinics, hepatology nurses and allied health professionals. A review of the literature was also conducted to inform the study.

Hepatology nurses played a central role in the education, counselling and management of treatment of those with hepatitis C. They were critical for enhancing treatment compliance and consequently improving patient outcomes. Their role in establishing effective relationships with patients was a vital part of empowering and giving patients ownership of their treatment and management.

Formal recognition of the role of hepatology nurses is yet to be achieved. Their position classifications varied across Victoria and this reflected the current ad-hoc nature of their employment. The majority of large metropolitan clinics relied on clinical trial funding to employ nurses and support staff.

Psychiatric and social work staff performed a critical role in assisting patients to overcome the debilitating psychological and physical side effects associated with treatment. Interpreters provided language assistance and assisted with cultural issues, therefore, increased the accessibility of treatment for those from culturally and linguistically diverse communities.

The number and role of hepatology nurses would vary depending on the setting and the model of care in operation. Due to the deficiency of data quantifying individual patient nursing care and treatment support requirements, this study was unable to quantify the number of nurses and allied health professionals needed for each liver clinic. Further research is necessary to identify the appropriate mix of models of care to ensure best practice and equitable access for individuals seeking care and support for Hepatitis C across Victoria.

P4
HEPATITIS C TIMELINE – A FURTHER FIVE YEARS

Harvey P H1, Loveday S K1, Brown R2
1Hepatitis C Council of NSW, Sydney, NSW, Australia; 2Hepatitis C Resource Centre, New Zealand

The hepatitis C epidemic is an evolving phenomenon involving people, place, politics and time. In order to gain a full understanding of our Australasian hepatitis C history it would be necessary to consult numerous texts, websites and other sources.

Following up on the poster, Hepatitis C – a decade of development, which was presented at the Second Australasian Conference on Hepatitis C, Christchurch, NZ, this poster chronicles major hepatitis C developments that have occurred within an Australasian regional context, during the five year period, August 1999 to August 2004.

Our poster aims to provide a snapshot of critical events, placing them on a historical timeline. Given the negative social and political connotations associated with HCV, and subsequent associated myths and misunderstandings, we believe that the insight provided through this poster will be especially beneficial to those with an interest in hepatitis C, infectious diseases and/or public health.
P5
QUEENSLAND HCV EDUCATION PROGRAM:
RESPONDING TO THE NEEDS OF GENERAL
PRACTITIONERS

Lambert S1, Bryan H1, Carmichael C1, Cooksley G1, Crawford D1, Dearden A1, Deppeler P1, Garrett L1, Najman J1, Quinn K, Waldeck C1, Macdonald G1
1School of Medicine, The University of Queensland, Brisbane, QLD, Australia; 2Brisbane North Division of General Practice, QLD, Australia; 3Queensland Alcohol and Drug Research and Education Centre, The University of Queensland, Brisbane, QLD, Australia; 4Royal Brisbane Hospital Research Foundation, QLD, Australia; 5Princess Alexandra Hospital Brisbane, QLD, Australia; 6Earlville General Practice, Cairns, QLD, Australia; 7Sexual Health Services, Toowoomba, QLD, Australia

At the beginning of 2004 a survey of all Medical Practitioners in Queensland was conducted by the HIV & HCV Education Projects of the School of Medicine, The University of Queensland, through the Medical Board of Queensland. The Survey was mailed by the Medical Board of Queensland and replies were returned to the School of Medicine via anonymous reply paid envelope.

The survey asked questions in three areas: knowledge on Hepatitis A, B & C; current methods of acquiring education in Hepatitis C; and preferred methods of education delivery in Hepatitis C.

11,346 surveys were sent and 3156 were returned (27.8% return rate). Of these 3156, 1141 were returned by GPs practicing in Queensland. This talk presents analysis from these 1141 surveys. The four preferred modes of delivery of Hepatitis C information were: fact sheets (88%); face to face CME activity (79%); small group case based activities (57%); and video / CD-ROM information (53%).

This poster presents information on the responses made by the HIV & HCV Education Projects of the School of Medicine, The University of Queensland to these findings and how each preferred mode of delivery of education to GPs has been addressed.

Firstly, the face to face courses, focussing on case based learning, offered by the HIV & HCV Education Projects are showcased. The face to face courses have been operating across Queensland since 2000 and have been staged in over 22 cities and towns cross the state – including rural and remote areas – and have attracted more than 1000 participants.

Secondly, fact sheets have been produced specifically for General Practitioners and have been utilised in the Hepatitis C Shared Care Clinical Pathway CD-ROM as well as in information packages sent to GPs across the state.

Thirdly the HIV & HCV Education Projects have produced a range of videos and CD-ROMs for health care workers unable to attend face to face meetings. Over 100 sets of CDs and videos have been distributed across Queensland.

P6
BBV GROUP EDUCATION IN A DETOX SETTING

Morris M1, Gilliver R1
1Hepatitis C Officer Project AIDS Northern Sydney Area Health Service, NSW, Australia; 2CNC Liver Clinic Project AIDS Northern Sydney Area Health Service, Sydney, NSW, Australia

Northern Sydney Health provides a range of blood borne virus health education and health promotion activities targeting specific population groups. These services are provided by a number of agencies, primarily HepNet, RUSH and the Liver Clinic. This abstract describes an education intervention developed by the HepNet, Liver Clinic and RUSH which targets clients of Drug and Alcohol services. Drug and Alcohol services have a significant number of Hepatitis C positive clients and provide what amounts to a captive audience for educational interventions. Over a period of 8 years, the local needle and syringe programme (now called RUSH) have been running a weekly BBV group for detox in-patients. This group is part of a health education approach which supports individual clients in their detox. One of the features of this inter-service arrangement is the degree of trust shown towards the RUSH team. The presence of a harm reduction based educational programme within a 12 step abstinence based detox is fairly unique and is seen as a valuable strength. Following a number of focus groups with staff of the Herbert St Detox, and discussions with group facilitators from RUSH, an opportunity was identified to review the weekly BBV group. While this group had been in place for a number of years, the content area had recently expanded to include Hepatitis C treatment and care issues. In addition, the group had been facilitated by a small number of RUSH staff. With a broadening of the facilitator group to include new staff, it was felt that there was a need to review the content and delivery of the group.
P7
CITY OF MELBOURNE HEPATITIS C AWARENESS PROGRAMME

Smith K1, Stanley D2
1City of Melbourne Drug Action Team, Melbourne, VIC, Australia; 2Convenience Advertising, Melbourne, VIC, Australia

In December 2002 The City of Melbourne, in collaboration with Convenience Advertising developed a targeted Hepatitis C education and awareness programme. This programme built upon the existing City of Melbourne Sharp Safe programme and is designed to communicate Hepatitis C education and awareness messages to people who inject drugs and to members of the general public. The strategy utilises the Convenience Advertising methodology of placing targeted messages in the bathrooms of public toilets.

The communication strategy development process was collaborative and involved stakeholders from the City of Melbourne, Hep C Council of Victoria, VIVAIDS, Foot Patrol and Living Room (a primary health service provider). In consultation with the stakeholder group, a strategy was developed that met the communication needs for both the general public and people who inject drugs. Messages were developed and focus tested with target audience groups in order to create a communications strategy that could deliver contemporary and relevant Hepatitis C messages with relevance to each group.

Upon conclusion of the creative development process, a placement strategy was developed and formulated. This was influenced by the collaborative model between Convenience Advertising and the City of Melbourne, and steering group, in identifying public toilet spaces that are appropriate to each target group. Messages were then placed in public toilets. The City of Melbourne Drug Services Card is also distributed with this strategy, as a take away information resource delivered with the injecting drug user message.

This campaign is currently being evaluated utilising a quantitative research methodology to establish the level of awareness of Hepatitis C and associated harms, and the effectiveness of communication with the target audiences in regard to message recall and information absorbed. The results of this evaluation will be presented to the 4th Australasian Hepatitis C Conference.

P8
TRANSFUSION IN THE PAST: A RISK FOR CURRENT HEPATITIS B AND C?

Tawk H1, Vickery K1, Bisset L1, Lo K S2, Cossart Y1, The Infection in Endoscopy Study Group
1Department of Infectious Diseases and Immunology, University of Sydney, Australia and the Australian Centre for Hepatitis Virology, Sydney, NSW, Australia; 2Institute for International Health, University of Sydney, NSW, Australia; 3Royal Prince Alfred Hospital, Sydney, NSW, Australia

We have determined the prevalence of current and past hepatitis B and C in 2000 endoscopy patients and related this to risk factors for exposure including transfusion in the past. Blood samples were tested for hepatitis B surface antigen (HBsAg), anti-surface antigen (anti-HBs), anti-core antigen (anti-HBc) and anti-HCV by Cobas Core II system (Boeringer Mannheim/Hoffmann la Roche, USA). HBsAg and anti-HCV positive patients were tested for HBV DNA and HCV RNA by in house assays. A risk factor questionnaire was completed by the patient. The date of transfusion was used to compare the risk of transfusion prior to the introduction of screening for HBV (1975) and HCV (1990) and the results were analysed using the SAS statistical package.

26% of patients had been transfused in the past, 20% of these prior to hepatitis B donor screening (in 1975) and 47.4% prior to anti-HCV screening (1990). This did not affect current prevalence of hepatitis B, but transfusion prior to and after introduction of screening for hepatitis C was associated with increased prevalence of hepatitis C infection by 4.8 and 2.7 fold respectively.

In conclusion, transfusion prior to screening was a minor risk for acquisition of hepatitis B in the community, but played a more significant role in transmission of hepatitis C with the risk of post-transfusion hepatitis C infection was halved after the introduction of routine screening. The apparent continuing risk of transmitting hepatitis C by transfusion in the post-screening era requires critical investigation of other nosocomial risks associated with the clinical situations where patients receive blood, as well as ongoing evaluation of the testing regimes used to screen donations.
EXPANDING ACCESS FOR HEPATITIS C TREATMENT AND SUPPORT SERVICES IN THE SOUTH WEST AND GREAT SOUTHERN HEALTH REGIONS OF WESTERN AUSTRALIA

Totten L, Mollison L
Fremantle Hospital, Fremantle, WA, Australia

Hepatitis C (HCV) is the most common cause of liver transplantation and the most notifiable disease. Approximately 150,000 people are currently infected with HCV in Australia. It has been estimated that the percentage of people with hepatitis C who have been treated totals just one per cent. It has also been projected that the number of people with cirrhosis, liver failure and hepatocellular carcinoma will treble in the next twenty years.

A Clinical Nurse Consultant was employed to improve access to hepatitis C treatment and support services for patients and GPs. Following consultation with stakeholders a series of workshops were held in Albany, Bunbury, Busselton and Margaret River and involved local physicians, GPs and other health professionals. Clinics were established in the community and patients were seen by a process of either self-referral or referral by a GP or a health professional.

Six clinics have been established in the South West and Great Southern Health Regions. A total of 240 patients have been seen. Of this number 119 patients are new patients. Twenty patients have commenced treatment and are currently being managed by their local GP and physician. Of these ten patients were completely worked up locally. A local hepatitis C nursing position is currently being established in the South West.

The implementation of this program has improved access to treatment for patients by improving and developing accessibility to local services and health management.
P11
HCV HIV CO INFECTION HYPERENDEMIC
IN INJECTING DRUG USERS IN VIETNAM
– IMPLICATIONS FOR TREATMENT
Walsh N1,2, Higgs P1, Crofts N1
1Centre for Harm Reduction, Burnet Institute, Prahran, VIC, Australia; 2Turning Point Drug and Alcohol Centre, Fitzroy, VIC, Australia

The population prevalence of hepatitis C (HCV) in Vietnam is high. It is higher in risk groups such as haemodialysis patients and patients with haematological disorders requiring transfusion. Among injecting drug users (IDU), it is almost universal.

Many cities across the Asian region have experienced explosive HIV epidemics in IDU, including Bangkok, Jakarta and Yagon. The prevalence of HIV in Ho Chi Minh City rose dramatically between 1997 and 2001. Sentinel surveillance indicates that currently 75% of IDU in HCMC are HIV positive.

The 2003 National AIDS Strategy of the Socialist Republic of Vietnam incorporates an HIV treatment strategy. Indeed there is a movement within Vietnam, as in other developing countries with South East Asia, to begin to treat people living with HIV/AIDS with the support of international funding agencies. With the introduction of more affordable antiretroviral treatment for HIV infection, chronic HCV infection and the accelerated course of this in immunocompromised individuals will become a progressively more important issue.

48000 (60%) of all known cases of HIV in Vietnam have been acquired through the sharing of drug injecting equipment. Almost all of these individuals are co – infected with HCV. WHO estimates the number of undetected cases of HIV in Vietnam at a further 100,000. This epidemiological pattern is similar to a number of other cities and countries in the region.

This epidemiological profile of blood borne viruses should be viewed as an epidemic of HCV HIV co-infection, rather than HIV alone, and treatment strategies modified accordingly. Here we discuss the implications for treatment, including barriers to, and need for, implementation of a co-infection treatment strategy, in a regional developing country setting using Vietnam as an example.

P12
HEPATITIS C: ELIMINATING SYSTEMIC
BARRIERS THROUGH POLICY AND PROGRAM INTEGRATION
Wickenheiser C A1, Potts J R1
1Health Canada, Centre for Infectious Disease Prevention and Control, Community Acquired Infections Division, Hepatitis C Prevention, Support and Research Program, Ottawa, Canada

Given the evident correlation between hepatitis C (HCV), HIV/AIDS and other sexually transmitted infections, some will argue that the nature of the disease is more complex and that the Government of Canada’s current response is insufficient. Many Canadian stakeholders now urge policy-makers and program planners to take a more proactive approach that permits focus on the disease-specific elements of HCV, while at the same time shaping policy and programs more strategically in areas where there are common risk factors and overlapping prevention, care, treatment and support issues.

This workshop will provide an opportunity to challenge traditional approaches to policy and program development, encouraging “out-of-the-box” thinking that is strategic and holistic. Workshop content will also provide a ‘snapshot’ of the current Canadian epidemiological profile of HCV and will outline areas of common concern and policy/programmatic intersections. This context will illustrate a paradigm shift that is occurring in Canada: a shift that is innovative, somewhat bold and not always popular or easy to articulate, but strategic in nature because it will, where appropriate, provide opportunities for policy and programmatic integration. The workshop will also introduce concrete examples of how an integrated response to hepatitis C, HIV/AIDS and other sexually transmitted infections can create unique opportunities for collaboration and partnerships, encourage implementation of comprehensive harm reduction principles and prevention initiatives, and facilitate a more holistic approach to the care, treatment and support that is both available and accessible by all people living with, affected by, or at risk of hepatitis C and other infectious diseases. Finally, the workshop will illustrate why it is also imperative to permit the logical departure from disease-specific responses that exist in “stovepipes” or “silos”, encouraging dialogue that permits addressing HCV and HIV/AIDS in a more integrated way, and in action that contributes to the elimination of systemic barriers that impede progress and contribute to the growing social and economic burden associated with these epidemics.
A system of government regulation of currently illicit drugs may go a long way to solving, or at least alleviating, many of these intractable access and knowledge issues.

For example, a system of regulation may include the sale of pre-loaded (know quantity and quality of drug) syringes and provision of safe injecting facilities on site. Education material would be available at the point of sale (POS), as well as counselors, educated peers and physicians.

A licensing system (as a component of Medicare?) for each drug a person desires to purchase would ensure (in many cases pre-initiation) education on the drug itself, its safe/re use and attendant potential health caveats. By licensing users, updating of these central educative components could be done on at least a yearly basis (when renewal falls due).

A system of regulation allows for the collection of data on users and use that is not possible under prohibition, as this information is available at POS, for every single purchase. This data can be used to develop and implement specific education campaigns/interventions for groups/individuals who are presenting as at risk of blood borne viruses (BBVs) and other health conditions.

The unfortunate reality of prohibition is increased and unnecessary harms to users of illicit drugs, their families and friends, and the communities in which they live. A model of regulation has the potential to grant the flexibility to respond more completely and appropriately to the myriad of health issues facing injecting drug users, including BBV transmission and management.

**P13**

**DRUG LAW REFORM & HEPATITIS C**

Liebke S R;1

1Australasian Hepatitis Council, Canberra, ACT, Australia

Australia is in the midst of an unprecedented rise in hepatitis C infections amongst injecting drug users (IDUs). Most recent figures put the number of new hepatitis C infections at 16,000 per year, and the prevalence of hepatitis C at approximately 230,000, or between 1-2% of the Australian population.

Many drugs, both licit and illicit are injected in Australia. These include heroin, cocaine, methadone, benzodiazepines, psychostimulants and steroids. How to reach all these users, with very different demographics, on the issues surrounding hepatitis C, its transmission, treatment and health maintenance?

A system of regulation of currently illicit drugs makes a number of outlets for injecting equipment exist in Australia, however, few studies have focused on injecting drug users (IDUs) who do not use Needle and Syringe Programs (NSPs). The study describes the hepatitis C risk practices of IDUs in South East Sydney with low or no NSP usage.

IDUs living or working in South East Sydney who rarely obtain injecting equipment from NSPs were interviewed from April to July 2003. Sample size was 294. IDUs were recruited via snowballing through personal networks of peer interviewers or “spotters” and advertising in relevant services and public spaces known to host drug related activity.

Mean age was 31 years (range 18-57), 64% were male. 69% identified as Anglo Australian, 32% were working, 59% on government benefits, 43% reported up to and including year 10 level education. 35% had never used or heard of NSP before, 18% had used only once and 47% used NSP irregu- larly.

In terms of risks for hepatitis C, 67% had re-used any injecting equipment after someone else in the last 6 months. 29% of the participants reported reusing needles and syringes, 49% reused spoons, 34% reused tourniquets and 28% reused filters. The reuse of swabs was reported by only 3% of participants.

People who reported re-use of injection equipment were more likely to: report someone else reusing their needles and syringes; have been injected by partner, family members; have injected with partner, family member, dealer, acquaintance and client; have lower education level; poorer knowledge of sharing injecting tourniquet; have obtained information about safe injecting from word of mouth; report higher polydrug use; prefer to get injecting equipment through other health services; report not convenient to go to NSPs; report being hepatitis C positive.

The results point to the need for interventions to address the needs of people who inject drugs and who have lower educational attainments, for people who inject drug in intimate partnerships and to further research on the dynamics of passing on injecting equipment to other people. The results also suggest the importance of peer networks in disseminating information and practice models.

**P14**

**HEPATITIS C RISK PRACTICES AMONG “HIDDEN” IDUS**

Treloar C1, Cao W1, Booth G2, Trask L1, Lowth A1, Dixon J1, Weatherall A2, Denoe M4, MacDonald M5, Laybutt B6

1National Centre in HIV Social Research, University of New South Wales, NSW, Australia; 2St George Hospital and Community Health Service, Sydney, NSW, Australia; 3HIV and Related Diseases Unit, South East Health, Sydney, NSW, Australia; 4 Kirketon Road Centre, South East Health, Sydney, NSW, Australia; ‘National Centre in HIV Epidemiology and Clinical Research, University of New South Wales, NSW, Australia; ‘Sutherland Community Health, South East Area Health Service, NSW, Australia

A number of outlets for injecting equipment exist in Australia, however, few studies have focused on injecting drug users (IDUs) who do not use Needle and Syringe Programs (NSPs). The study describes the hepatitis C risk practices of IDUs in South East Sydney with low or no NSP usage.

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P15  
**BLOOD AWARENESS FOR HEPATITIS C PREVENTION EDUCATION: NEW DIRECTIONS?**

*Treloar C1, Fraser S1, Valentine K1, Kippax S1*

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There has been limited success of education programs to prevent the transmission of hepatitis C among people who inject drugs. “Blood awareness” has been a central component of these efforts. However, little has been published about how people who inject drugs view blood within the injecting process and in other contexts. This study sought to examine the meanings ascribed to blood by people who inject drugs to contribute to innovative education efforts for hepatitis C prevention education.

A larger study interviewed people with a range of relationships with blood. This presentation focuses on analysis of interviews with 32 people who were current or ex injectors, including 16 females, aged 18 to 51 years, 20 reported being seropositive for hepatitis C, 8 seronegative and 4 reported they had “cleared” the virus.

The interview schedule was designed to take in issues and contexts related to blood that were broader than most previous research with people who inject drugs. The participants were asked to discuss their experience, perceptions and constructions of blood in numerous settings such as injecting, transfusion, donation, in daily life (accidents, shaving, menstruation, media) as well as emotions associated with blood.

Blood was described and discussed in typically biomedical terms by this primarily “Anglo-Australian” sample but with little knowledge of the functions of blood in the body. People with hepatitis C described their blood in derogative terms yet acknowledged the life saving functions of blood. A range of emotions were associated with blood in various contexts and various notions of identity were ascribed to blood in the body and out of the body.

The results highlight a number of issues which can be considered in the development of future education messages for hepatitis C prevention. The experiences of blood outside of the injecting context may provide innovative strategies for hepatitis C prevention education: this presentation will expand on suggested strategies. In addition, a broader focus on blood may challenge the assumption of people who inject drugs as outside of normal society.

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P16  
**DELPIDATION OF ENVELOPED VIRUSES: A NOVEL APPLICATION TO VIRAL INACTIVATION AND VACCINE DEVELOPMENT**

*Cham B1, Vickery K2, Cossart1*

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Many viruses including HIV, HBV and hepatitis C have an outer lipid envelope which supports inserted viral peptides, maintaining them in the “correct” functional conformation and orientation. A key problem in developing inactivated vaccines for such viruses is the loss of antigenicity which accompanies disruption of the virus particles by solvents. We report a novel approach to viral inactivation which modifies the whole virion rendering it noninfective, but retaining its antigenicity.

Using a mixture of 60% diisopropylether and 40% butanol DHBV positive serum was delipidated. Residual infectivity was tested by inoculation into day-old ducks. All positive control ducks injected with untreated serum became infected with DHBV while all seven ducks inoculated with delipidated serum remained uninfected (p<0.001).

The antigenicity of the delipidated serum was tested by comparing its ability to induce immunity and prevent infection in ducks when used as a vaccine with that of serum containing DHBV inactivated by glutaralderhyde treatment. Ducks were vaccinated 3 times with delipidated serum, glutaraldehyde treated serum or serum mixed with PBS (positive control) and challenged at 4 weeks of age with a high dose of DHBV. Vaccination with the delipidated serum resulted in protection from infection and anti-DHBs antibody production in 5 of 6 ducks indicating that immunity was induced in these ducks. In comparison, 5 of 6 control ducks vaccinated with PBS and 4 of 4 ducks vaccinated with glutaraldehyde inactivated serum became DHBV positive following vaccination (P<0.05), indicating no induction of immunity of these ducks.

This study shows that this solvent system is capable of inactivating DHBV and that the viral delipidated proteins retain epitopes that are capable of generating protective immunity and specific anti-DHBs antibody in recipients. This supports the premise that delipidation of enveloped viruses with specific organic solvents has potential as the basis for development of vaccines.
P17
EARLY ONSET INJECTING DRUG USERS TAKE MORE HEALTH RISKS

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Early onset injecting drug users represent an extreme segment of the drug using population. They are probably at greater risk of negative outcomes than other drug users since they combine two well-known risk factors: a) early onset drug use, and b) injecting drug use.

Early onset drug use is associated with problematic beginnings - marginalized ethnic groups, stressed/dysfunctional families, problem behaviours – and also with problematic outcomes, at least in the teenage and early adult years – early school drop out, heavy drug use, crime, unemployment, etc.

In our Initiation and Transition study, designed by ourselves and other agencies1, and based in Sydney, Melbourne and the Northern Rivers area, early onset injecting drug users (aged 12-16), compared with later onset injecting drug users (aged 17-24), were found to have all these characteristics plus some additional ones, namely, they also took greater health risks, which put them at risk of long-term chronic illness through blood-borne viruses, especially hepatitis C.

Other research in Australia and the USA has found that borrowing of injecting equipment is more common among early injecting drug users than among later injecting drug users. Our study confirmed that early injecting drug users were more likely to have borrowed equipment in the last 6 months. In addition, in our study, we found that borrowing practices start at initiation, when early injecting initiates, more than later initiates, tend to rely on others to give them their first injection and to supply their first fit. We also found that early onset injecting drug use, as against later onset, was independently associated with being untested for hepatitis C at time of interview.

Another interesting finding of the present study, which may have implications for prevention and treatment of the above risk-taking behaviours, is that early onset injecting drug users were more likely than late onset injecting drug users to have immediate family who inject (parents or siblings).

1 Ted Noffs Foundation, Kirketon Road Centre, National Drug and Alcohol Research Centre, NSW Users and AIDS Association, The Australian Intravenous League.

P18
KNOWLEDGE OF HEPATITIS AMONGST YOUNG PEOPLE WHO ATTENDED MUSIC FESTIVAL

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1National Centre in HIV Social Research, University of New South Wales, NSW, Australia

Late teenage years are the most common time for initiation of injecting drug use. To understand drug use pattern among young people and their knowledge regarding hepatitis and risk behaviour help agencies to take evidence-based decisions for policy and practice. However, the existing data available on drug use among Australian youth is limited.

A survey was conducted at a youth-oriented music festival in Sydney in January 2004 (Big Day Out). People walked past the stall hired by researchers were approached and asked to complete a self-administered questionnaire.

Of the 674 survey participants, 1% had injected recently and 1% reported being hepatitis C positive. About 70% of the participants knew that unsterile tattooing, body piercing, and sharing injecting equipment were not safe. Half of the participants knew that having unsafe sex and sharing razors or toothbrushes could be risky. Fewer than one third of participants gave correct answers regarding non-existence of vaccination for hepatitis C, the fact that hepatitis C treatment is not effective for everyone and, the possibility of vertical transmission of hepatitis C. Knowledge of hepatitis did not differ by gender or sexual identity. Participants who had ever used an illicit drug (other than cannabis) knew more about hepatitis C risks. Participants who had been tested for hepatitis C/B had significantly higher proportions of correct answers to every question.

Although the prevalence (58%) of ever using an illicit drug (other than cannabis) in this setting was higher than in the general population (eg 18.5% reported in the national household survey) the prevalence of injecting and hepatitis infection were low. The findings suggest that early intervention may be useful and feasible in this setting before initiation to injecting drug use. Better understanding of hepatitis amongst participants who had ever used drug demonstrated that existing health education information has some effects. However, the overall knowledge of hepatitis was poor (mean knowledge score was 5.6 of 11), which indicates a need for education. The importance of testing for blood borne virus is indicated by the significant association between testing and higher knowledge scores.
P19  WHATS THIS HEP C THING? AN INTERACTIVE INTERNET ACTIVITY FOR SECONDARY SCHOOL STUDENTS

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Many young people in Australia are affected by Hepatitis C. However low levels of knowledge about it in the community and schools contribute to ignorance about its transmission and fuel discrimination against people who are affected. An important step in preventing new hepatitis C infections in young people and reducing discrimination is to ensure they learn about hepatitis C and its transmission pathways.

Due to the sensitivities surrounding hepatitis C, innovative strategies are required to enable schools to incorporate it into the curriculum in meaningful and acceptable ways. Many young people feel confident using the internet and are utilising it as an important source of information. Therefore the Internet has obvious potential as an enticing and interesting education tool, particularly when activities are drawn from youth culture. Furthermore, where the surrounding issues are highly sensitive information can be accessed in a way that is private and anonymous.

‘What is this hep C thing?’, is an internet activity about hepatitis C. It was created with the assistance of a group of secondary school students and uses a simple Q & A approach embedded in a story with a creative element. Students can complete a story ending in response to a dilemma presented during the activity. The activity supports classroom discussions by providing factual information around transmission, discrimination, relationships and support services.

While providing an evidence based model for health education activities for young people and increasing knowledge, it also aims to reduce hepatitis C related discrimination and alert young people about risk at a time when drug choices are being made, enabling them to engage with prevention strategies.

The activity has been evaluated, using quantitative and qualitative methodologies, to measure its efficacy and acceptability as an educational tool. This paper will discuss the design and development of the activity as well as evaluation findings. It will be of interest to those working in hepatitis C education and prevention with young people.

P20  DEPRESSION, ANXIETY AND SOCIAL FUNCTIONING IN A COHORT OF PEOPLE WITH OR AT RISK OF HEPATITIS C

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C-CLEARLY is a community-based programme offering an holistic approach to health care for people in South Australia, with or at risk of acquiring, hepatitis C virus (HCV). The programme offers care coordination, education, advice and advocacy for participants and General Practitioners through a Project Officer, and access to Dietician and Psychologist services. On entry to the programme, participants complete an extensive survey including the SF36, Zung Depression Scale, PrimeMD Depression, Anxiety, Eating, Panic and Alcohol scales and a symptoms list.

C-CLEARLY has enrolled 207 people. 182 are HCV antibody (Ab) positive, 20 Ab negative and 5 unknown status or not tested. There are 118 males, 86 females and 3 transgender. 43% of participants have ever been in prison or juvenile detention. 34% are employed. The median income range for the cohort is $9-15,000 per annum.

Current depression is indicated in 132 HCV Ab positive participants (73%) of whom 47 (26%) have scores consistent with severe depression. This compares with a general population figure of approximately 12% for mild to moderate depression and 3% for severe depression. 76 of 182 HCV Ab positive participants meet the criteria for dysthymia (low grade persistent depressed mood). Dysthymia has been associated with risk-taking behaviour.

HCV Ab positive people in this cohort have significantly lower scores compared to the population norms across all SF36 domains.

Generalised anxiety disorder is indicated in 65 (36%) Ab positive people and recent panic attacks in 44 (24%) of Ab positive people. This compares a general population figure of 7-13%.

Very high rates of depression, dysthymia and anxiety are present in this cohort. People with or at risk of HCV infection in this cohort display a very low rate of social functioning, low employment rate, high poverty rate and high rate of incarceration.
P21
HEPATITIS C-RELATED INFORMATION ON THE INTERNET: PERSPECTIVES OF PEOPLE WITH HEPATITIS C

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This paper presents data from interviews on information seeking practices of people with hepatitis C. The interviews are part of a larger quantitative and qualitative research project exploring the use of print- and internet-based information sources by people with hepatitis C.

Traditional modes of information provision within clinical encounters have been altered by public internet access to resources and information that were previously accessed almost exclusively by health professionals. While medical literature raises concerns among health professionals about the quality of online health information, little empirical research addresses health consumer practices and perspectives.

People responding to a national online survey of internet use for hepatitis C-related information, were asked to volunteer for a follow-up face-to-face interview. Twenty people, from NSW, VIC and WA, were interviewed.

The results indicate that the internet is used by people with hepatitis C to clarify information from health professionals and to keep up with treatment developments. The paper identifies strategies used by people with hepatitis C to navigate and negotiate this changing health information environment, including means of assessing the reliability and validity of information found on the internet.

The paper concludes that clinical consultations can be seen as opportunities for information exchange and dialogue between health professionals and people with hepatitis C.

P22
ONGOING SOCIAL NEEDS OF POST LIVER TRANSPLANT PATIENTS WITH A HISTORY OF HCV AND ALCOHOL OR DRUG DEPENDANCE

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The National Liver Transplant Unit is based at Royal Prince Alfred Hospital. Forty percent of patients have a history of hepatitis C. An increasing number also have a history of alcohol or drug dependency. Many of these patients face a range of social adjustments post transplant.

Many have been through long periods of illness and unemployment during which they have lost friendships and the ability to form links in the community. Post liver transplant this has resulted in social isolation and lack of support networks. Most commonly the patients are often single men with a history of prolonged alcohol abuse, they feel the only place they can socialise is the pub and often times this brings them back to a way of life they are trying to avoid. Those without particular work skills, find it extremely difficult to regain employment.

The problems for patients in rural areas can be more acute as it is often more difficult to identify support structures. Because of these ongoing difficulties in re establishing a “life” for themselves post transplant and the social isolation they encounter, this group of people may be prone to recidivism of alcohol/drugs, depression and in extreme cases suicide.

At RPAH we are currently developing a support program for these patients. This program will be of greatest assistance to patients who live locally but further strategies need to be developed for patients who live in rural in regional areas.

This discussion will more closely exam the issues and needs of these patients and outline the support program.
P23
“'I SUPPORT MYSELF': EXPERIENCES OF INDIVIDUALS LIVING WITH HEPATITIS C IN NEW ZEALAND

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It is conservatively estimated that 30,000 individuals living in New Zealand have hepatitis C (HCV). As a significant public health issue affecting New Zealand it has received minimal public, policy, media or research attention. HCV is truly New Zealand’s ‘silent epidemic’, characterised by poor social supports, and with a public and often professional ignorance around the disease. As a Post graduate student with hepatitis C, my 2004 research seeks to speak to this silence by giving twenty individuals with HCV an opportunity to voice their experience. Participants were drawn from Narcotics Anonymous and the Hepatitis C Resource Centre. Emerging from this qualitative data are themes of isolation, self reliance and uncertainty. Under-scoring this is the frustration caused by an often patronising, one dimensional medical system, and an ignorant, discriminatory public.

Faced with scant information participants generally research the ramifications of their disease themselves, utilising avenues other than those offered by the medical system. Other key issues identified include the dilemmas surrounding disclosure and coping with the debilitating nature of interferon treatment. Individuals speak of ‘supporting themselves’, a situation brought about by a reluctance to disclose, the inability of others to deal with chronic illness and the lack of social supports in New Zealand for people with HCV. Research findings indicate that while participants who belong to Narcotics Anonymous have stronger social supports, the majority in the sample were alienated by their disease and had little help in dealing with problems associated with chronic hepatitis C. Despite this, this study shows that participants demonstrate resilience by employing strategies to reassert control within a situation characterised by uncertainty, disempowerment and stigma.

P24
THE EXPERIENCE OF INTERFERON-BASED TREATMENTS FOR HEPATITIS C INFECTION

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Findings from clinical trials of interferon-based treatments for hepatitis C infection show substantial decrements in some patients’ health-related quality of life due to debilitating physical and psychiatric side effects from therapeutic drugs. However such quantitative measures do not provide detailed information about the social context and processes behind people’s experience of treatment.

In this paper, the authors discuss issues pertaining to interferon-based treatments and their side effects via interviews conducted in 2001 and 2002 with 19 people living in New South Wales with hepatitis C infection. Specifically, the paper explores participants’ decisions to seek treatment and the daily experience of being in treatment. The authors highlight some of the strategies deployed by patients to cope with incapacitating treatment induced adverse events. This information is increasingly important as pegylated interferon and ribavirin has been adopted as the mainstay of hepatitis C treatment in Australia and other parts of the world. It is forecast that many more people will seek treatment for their infection following improvements in sustained virological response rates, inclusion in the PBS S100 prescriptions category and a relaxing of restrictions on access to treatment.

The authors argue for further qualitative research to enhance knowledge of the impact of side effects and to uncover strategies that enable patients to adhere to a long and arduous treatment regimen.
P25
ANXIETY AND DEPRESSION STATES THROUGHOUT COMBINATION THERAPY, USING THE HADS MEASUREMENT TOOL.
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Studies have suggested that there is a correlation between anxiety, depression and Hepatitis C infection, with a higher prevalence of these disorders in the Hepatitis C (HCV) positive population. It has also long been held that Interferon based Combination Therapy worsened existing depression, while also placing patients at higher risk of developing depressive symptoms.

The Hepatitis C Social Worker at the John Hunter Hospital (JHH) has been using the Hospital Anxiety and Depression Scale (HADS) measurement tool to assist the accurate identification of anxiety and depression in a hospital based outpatient treatment clinic for more than 1 year. This measurement tool has been tested in various chronic illness populations - Coronary Care, Stroke and chronic Arthritis and was shown to be a simple, sensitive and reproducible measuring instrument. In this study, it has proved to be a valuable resource in the identification of rates of disorders, changes over time in symptoms and therefore provided direction in the appropriate management on treatment.

A series of measurements were taken, including baseline (pre-treatment) total scores and separate anxiety and depression scores which were repeated at weeks 4 and 12. Further data, including whether the patient required pharmacotherapy for depressive symptoms during treatment will be presented.

This paper will discuss the initial findings of a report on 50 patients undertaking Combination therapy at the John Hunter Hospital over an eighteen month period who were assessed using the HADS tool.

P26
HEPATITIS C PATIENT PERCEPTIONS OF FATIGUE DURING THE INITIAL TWELVE WEEKS OF INTERFERON AND RIBAVIRIN THERAPY
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1Fremantle Hospital, Fremantle, WA, Australia

Treatment with interferon and ribavirin produces side effects including lethargy in 47 to 90 per cent of patients. Severe fatigue in some instances may even result in discontinuation of treatment. Previous studies have failed to measure the intensity and impact of fatigue on daily life.

The purpose of this study was to measure the intensity, duration and interference of fatigue on daily life during the first twelve weeks of interferon and ribavirin treatment.

A total of 24 patients from the Outpatient Department at Fremantle Hospital participated in the study. The Fatigue Symptom Inventory was administered fortnightly. The General Linear Model repeated measure analysis of variance was utilised to ascertain the differential treatment effects on fatigue.

Male patients experienced a significant worsening in perceptions of the intensity, interference and duration of fatigue during the first twelve weeks of therapy (p < 0.05). Female patient perceptions of fatigue did not appear to significantly worsen between 0 and week 12 of the treatment regime.

This study demonstrates the differences in perceptions of fatigue between males and females during interferon and ribavirin therapy. Strategies to assist male patients in dealing with fatigue need to be developed to in the future to enable continuation of therapy and minimise these effects on daily life.
P27
PERCEIVED CHANGES IN MOOD FOR HEPATITIS C PATIENTS UNDERGOING INTERFERON AND RIBAVIRIN THERAPY

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1Fremantle Hospital, Fremantle, WA, Australia

The psychological side effects of interferon and ribavirin are well documented. Approximately 20 to 63 per cent of people suffer from psychiatric side effects. Standardised measures, which assess and detect changes in mood, should be utilised during interferon and ribavirin therapy.

The Profile of Mood States was administered fortnightly to detect changes in tension-anxiety, anger-hostility, depression-dejection and confusion-bewilderment. Twenty-four patients from the Outpatient Department at Fremantle Hospital completed the questionnaires during the first twelve weeks of interferon and ribavirin treatment.

Male patients experienced a significant worsening in perceptions of tension-anxiety and depression-dejection during the initial twelve weeks of the treatment regime ($p < 0.01$). Significant differences were observed for female patients in the Depression-Dejection Subscale of the POMS between Week 10 and Week 12 of the treatment regime ($p < 0.01$).

In patients who participate in the interferon and ribavirin program depression-dejection and worsening in perceptions of tension-anxiety were common. The use of standardised questionnaires to detect these changes needs to be implemented as part of normal management so that interventional strategies can be implemented.
P28
LIVING WELL WITH HEPATITIS C
Bourne A1, Gaston W1, Leane K2, Robertson F3
1Relationships Australia (SA), SA, Australia

MOSAIC, a program of Relationships Australia (SA), provides an innovative counselling service for people affected by Hepatitis C and HIV. This lively, interactive workshop will provide an overview of how a counselling service underpinned by health promotion principles works with the HCV affected community to develop personal skills and resources, strengthen community action, and build collaborative partnerships as the foundation for a holistic, effective and responsive service for people living with hepatitis C.

The workshop will showcase how best practice in counselling, group work, and the development of collaborative partnerships with hepatitis C community organisations, hospitals, and other relevant services promotes the emotional and mental health and well being of people living with Hepatitis C.

P29
COMPLEMENTARY & ALTERNATIVE THERAPIES FOR HEPATITIS C
Brown R V1
1Hepatitis C Resource Centre Te ika a Maui

In 2003, the Auckland-based Hepatitis C Resource Centre published the results of a postal survey designed to gather information for future services planning. The questionnaire covered a broad range of issues including the use of complementary and alternative therapies.

The responses we received supported our existing anecdotal evidence about the widespread appeal of alternatives. The project highlighted an urgent need for a cheap, comprehensive and accessible information resource about CAM therapies and hepatitis C. These therapies are an important factor in the lives of hepatitis-C affected people - a factor that we cannot afford to overlook in planning to meet the needs of the community we serve.

At the same time, the Christchurch-based Resource Centre had contracted with the Ministry of Health to coordinate the development of a National Hepatitis C Resource Manual, loosely based on the Australian publication first released in 2002. With the intention of ‘killing several birds with one stone’ Robyn, from the Auckland group, agreed to research and write the chapter on complementary and alternative therapies. As a tiny organisation with a huge workload and a budget for only 40 - 60 paid staff hours, we are always looking for ways to work smarter rather than harder.

Complementary and alternative therapies for hepatitis C was first published and pre-tested as our Autumn 2004 newsletter. Edited and probably substantially abridged, it will be included in the National Resource Manual. We would like to share it and our knowledge of CAM therapies with the community in this presentation.
P30
SMART BODY ART – HENNA TATTOOING
PROJECT FOR QUEENSLAND CORRECTIONAL CENTRES
Costello M1
1Family Planning Queensland, Australia

Tattooing equipment in prisons is contraband, homemade, difficult (if not impossible) to sterilise and is often shared. The high prevalence of hepatitis C in prisons indicates unsterile tattooing is a significant source for transmission of HCV. The Family Planning Queensland Correctional Facilities Education Project developed a henna tattoo project to deliver education to women in Numinbah correctional centre. Women were required to attend 3 education workshops to gain Department approval to receive a henna tattoo. The workshops were based on action research methodology and encouraged information sharing and story telling.

The poster presentation will provide an overview of the project, including workshop content and report on project outcomes.

P31
A COMMUNITY RESPONSE TO HEPATITIS C IN SAUDI ARABIA
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1,2King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia

Within the Kingdom of Saudi Arabia (KSA) the education of nurses regarding hepatitis C and associated hepatitis diseases is being approached in a unique way. Unlike most other countries Saudi Arabia does not have health education programs that originate from the Ministry of Health or other government bodies. Health education in KSA is an initiative of hospitals making this a unique environment in which to practice.

This presentation will outline the model put in place when a pharmaceutical company approached a teaching hospital to become the facilitators of Hepatitis C workshops for nurses Kingdom wide. It will describe the pre and post workshop tests results, the community response to this educational model and the intended follow-up.

To date, workshops have been completed in Riyadh, Jeddah and the Eastern Province. It is intended the workshops will be repeated every few months to increase both health professional and public awareness of hepatitis C.

With many patient’s hepatitis C positive in both our institution and Kingdom wide, we believe that education is essential for community education and safe nursing practice.
EVALUATION OF A QUANTITATIVE NUTRITION NEEDS ASSESSMENT FOR PEOPLE LIVING WITH HEPATITIS C IN SOUTH AUSTRALIA

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Although there is currently little clinical evidence that improvements in diet have any direct virological effect, people with hepatitis C can optimise their nutritional status and their resistance to other infections through a healthy choice of food. As the majority of people with hepatitis C will not develop advanced liver disease, hepatitis C itself will not likely shorten their lives. However, people with hepatitis C have an equal or greater risk of developing chronic nutrition related diseases such as obesity (which is associated with increased risk of liver fibrosis), diabetes (which people with hepatitis C have an increased risk of developing) and heart disease.

The purpose of this study was to identify and assess beliefs in the general area of food and nutrition, nutrition related challenges faced by people living with hepatitis C and resources that would be considered valuable and useful to help improve their food choices.

A short piloted questionnaire was distributed via the Hepatitis C Council of SA mailing list and a small number of copies were distributed to centres with access to people living with hepatitis C. Response rate was 30% (n=38).

All respondents agreed that it is important to eat healthy food when affected by hepatitis C. The main barriers to eating healthy food were feeling too tired to cook or shop (66%), not having enough time to prepare healthy meals (53%) and being unable to afford healthy food (53%). Low access to nutrition services in SA was also reported as a barrier – 84% of respondents had never seen a dietitian, although more than 50% of those people believed seeing a dietitian would be very useful.

Although there were several limitations to the study (such as small sample size), the results indicate a greater need for focus on lifestyle issues to promote healthy eating and enable healthy food choice in people living with hepatitis C. This presentation will explore the results and issues further.
P34

POSITIVE CONNECTIONS

Morgan H J

1AIDS Hepatitis and Sexual Health Line, VIC, Australia

The AIDS Hepatitis and Sexual Health Line Inc. (originally known as AIDSLINE) was formed in 1985 in response to the emerging HIV/AIDS epidemic. Our name was changed in 1998 to reflect the fact that as well as dealing with sexually transmitted diseases other than HIV, we also offer services on viral hepatitis. The service provides confidential telephone counselling, information and support on HIV/AIDS, Hepatitis, STIs and sexual health to the general community. The telephone counselling services are staffed by interested volunteers who undertake an intensive training program. We also provide education on these issues through workshops and outreach programs. The organisation is managed by a small team of staff, and overseen by an elected Committee of Management.

The exhibit will highlight three key projects/strategies, which focus on providing services and education to marginalised groups within our community. We will demonstrate how collaborative approaches have seen the successful implementation of the following:

• Blood Borne Virus education program specifically tailored to indigenous workers.
• Vietnamese Hepatitis C Information Line, which was established seven years ago.
• Cambodian Hepatitis C Information Line currently in development.

P35

TREAT YOURSELF RIGHT

Mortimer E1, Schirmer K1, Bunting C2, Bourne A2, Gaston W3

1Hepatitis C Council of South Australia, SA, Australia; 2Royal Adelaide Hospital, SA, Australia; 3Relationships Australia (SA), SA, Australia

“Treat Yourself Right” is an innovative information package that has been put together to promote positive wellbeing and provide practical strategies for people undertaking conventional treatment for hepatitis C. The booklet provides practical strategies that will assist people to prepare for treatment, manage side effects, respond to the challenges of maintaining relationships, family and work commitments and ultimately move on after treatment, whatever the outcome. The section on managing side effects is extensive and provides a range of useful and creative responses to the sometimes debilitating impact of treatment.

“Treat Yourself Right” has been developed in close consultation with people who have been on treatment and others who are planning to undergo treatment. It reflects their experiences, outlines some of the strategies they found helpful and suggests other supports for people whilst they are on treatment.

Development of the booklet has been a collaborative project between the Hepatitis C Council of South Australia, the Viral Hepatitis Centre at the Royal Adelaide Hospital and Relationship Australia (SA) and the affected community.
PEER EDUCATION AND SECONDARY NEEDLE AND SYRINGE DISTRIBUTION AMONG YOUNG INJECTING DRUG USERS IN THE TOP END OF AUSTRALIA

Rourke M C1, Gibbs S M1, 2
1Territory Users Forum, NT, Australia; 2Network Against Prohibition, NT, Australia

Data presented by the Australian Institute of Health and Welfare indicates that the Northern Territory has the highest rate of illicit drug use in Australia. The NT has a long history of substance use and a diverse population of people who currently use illicit drugs. It is estimated that there are 3000 people who inject drugs in the Greater Darwin area.

The stigma and discrimination associated with illicit substances makes it extremely difficult for service providers to engage with people who use these substances. This is exacerbated by small population sizes in regional centres within the NT.

A wave of anti-drug propaganda in the only daily newspaper in the NT coupled with a recent Government crackdown on people who use illicit drugs has major implications for people working to reduce the harm associated with drugs, particularly for those workers and agencies trying to reduce the number of people infected with HCV and/or HIV.

Drug users in the Northern Territory are working together to take peer education back into our communities, utilising strong community networks crossing a diverse range of people who use/inject illicit substances.

The presenters are both young people who inject drugs and are involved with the two drug user organisations in the Northern Territory, the Territory Users Forum, who facilitate a structured peer education project and the Network Against Prohibition who operate an underground needle/syringe distribution program, information, support and referral service. This session will focus on the activities of the presenters and their involvement with both of these services.
**P38 WORKING WELL: VOICES OF EXPERIENCE**

Wickenheiser C A1, Sargeant S M2
1Health Canada, Population and Public Health Branch, Hepatitis C Community-Based Support Program, Vancouver, British Columbia, Canada; 2Positive Women’s Network, Vancouver, British Columbia, Canada


Working Well was produced through a partnership between Health Canada (the funder) and the community groups working with those impacted by hepatitis C. The experiences of community groups working in hepatitis C prevention and education, documented in Working Well, demonstrates the important role of community-based organizations in addressing this challenging health issue among the diverse populations in British Columbia, Canada.

This interactive, multimedia workshop will highlight the interview process and the experience of gathering and synthesizing the learnings of community groups. The workshop will present the key learnings identified in Working Well ie. the importance of partnership at all levels; actively involving those impacted by hepatitis C and ways to deal with the stigmatizing effects of hepatitis C. The facilitators (authors) will engage workshop participants in a discussion of common and contrasting experiences and themes in their work with those infected with, affected by and at risk for hepatitis C.

By sharing and discussing common and contrasting experiences, community-based organizations and healthcare workers in other countries can actively benefit and learn from the experiences of strategies that have worked well for communities in British Columbia, Canada.

Working Well: Voices of Experience From Community-Based Projects Involving People Infected With, Affected By and At Risk for Hepatitis C in B.C. will be made available to conference participants.

**P39 HARM REDUCTION BY YOUTH, FOR YOUTH: A NATIONAL YOUTH-AT-RISK SYMPOSIUM**

Dinner K1, Donaldson T1, Murray W1, Potts J1, Wickenheiser C A1, Padgett C2, Sledgers B3, Robinson C1
1Health Canada, Canada; 2YouthCo, Canada; 3Access, Canada

In Canada, an estimated 250,000 persons are currently infected with the hepatitis C virus (HCV), with 5,000 new diagnoses annually. The majority of new HCV infections are among injection drug users (IDUs). Canadian street youth are at high risk of injection drug use and many become HCV-infected in young adulthood. The key to prevention is reaching youth before they initiate risky behaviours and targeting initiatives to reduce HCV transmission in diverse communities of at-risk youth.

Canadian provinces and territories are responsible for delivery of health care services. In 1998, the federal government launched a national Hepatitis C Program, which complements provincial/territorial services. The Program has strengthened care & treatment for persons with HCV, while also focussing on primary prevention for IDUs and those at risk for initiating injection drug use (street youth, Aboriginal people, prison inmates).

Although HCV lacks a natural political constituency, the diverse ideas and voices of youth have given new energy and direction to the Program. The (older) fight against HIV - often led by peers infected, affected, and at-risk - provides a model for HCV prevention. A review of community-based youth projects found that the most effective were peer-based and targeted at specific risk populations (i.e., IDU, street-involved, tattoo and piercing, and steroid use.) Youth requested training on strategies to reach peers prior to the initiation of risky behaviours, and integration of HCV prevention with other programs (e.g. safer sex).

A National Youth Symposium that convened youth peer educators and outreach workers from across Canada was held in March 2004 as a satellite to the 2nd Canadian Conference on Hepatitis C. For our presentation, youth leader(s) will report on this ground-breaking event that: profiled unique regional projects and “lessons learned”; fostered sharing, discussion and dissemination of HCV prevention knowledge among our culturally, linguistically, and geographically diverse communities; and created a “youth network” to support and raise the profile of youth issues and their solutions for effective prevention initiatives.
P40

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Hepatitis C virus (HCV) is a parenterally transmitted pathogen with a worldwide distribution, and is a major public health problem. This study describes cases of HCV infection notified to State health authorities in South Australia between 1995 and 2002, to estimate the magnitude of the problem and identify factors that may impact on control programs. Notification data for the period were reviewed, analysed by demographic and clinical status combinations and related to risk factor information. The year of infection was estimated using incident case age data, age of first injecting drug use (IDU) and year of transfusion, to map the HCV epidemic in time.

In South Australia, 11,940 cases of HCV infection were reported between 1995 and 2002, including 506 incident cases. The prevalence of HCV infection in South Australia is estimated to be 0.8%. IDU was the dominant mode of HCV transmission among incident cases, and prevalent cases born since 1960, 12% of this group also had tattoos. In those born before 1950, infection is largely attributed to receipt of blood, or residence in countries with high HCV prevalence. Most prevalent cases were born between 1950 and 1979, and two thirds of cases are male.

Regulation of legitimate skin piercing activities has successfully reduced the spread of HCV by these mechanisms. Needle exchange programs are likely to have assisted in slowing the HCV epidemic. Ninety percent of recent transmission is due to sharing IDU equipment. Maternal to infant transmission is likely to be under-reported thus far. Future control strategies might include education of those infected, safe injecting venues, and treatment of current injecting drug users. Prisons bring together many people in target populations for control strategies. The health burden of those infected with HCV is likely to increase rapidly as many reach twenty years of infection.

P41
HEPATITIS C VIRUS INFECTION IN INDIGENOUS AUSTRALIANS IN SOUTH AUSTRALIA: 1995 – 2002

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Hepatitis C virus (HCV) is a blood borne human pathogen that infects the liver and is a major public health problem. This study describes cases of HCV infection notified in South Australia between 1995 and 2002 who identify as Aboriginal. Analysis of medical notification data for Indigenous HCV cases in the period used birth cohorts to describe the population in time, and described risk factors in relation to demographics. Among 11,527 medical notifications, 700 cases identified as Aboriginal; 627 prevalent cases and 73 incident cases (male to female ratio 1.7:1).

Aboriginal people account for 2% of the South Australian population but comprise 6% of HCV cases reported in South Australia. Aboriginals are also greatly over-represented in prisons, and most male incident cases were tested whilst in prison. Fourteen percent of incident cases identify as Aboriginal. Injecting drug use (IDU) alone was the likely mode of HCV transmission in 68% of cases, a further 15% had IDU plus tattoos as risks for infection, thus 83% of cases are associated with IDU. In 95% of incident cases, IDU was the sole risk for infection. Most indigenous cases (87%) were born after 1960 and 78% of incident cases were born after 1970. Aboriginal people infected with HCV are generally younger than non-indigenous cases. Among Indigenous people, 96% of recent HCV transmission, in incident cases, is due to sharing injection equipment. Control strategies should include culturally appropriate education, especially for those already infected, safe injecting venues, and treatment of current injecting drug users. The future health needs of indigenous Australians infected with HCV are likely to be more complex than non-indigenous cases, given the current health contrasts between the groups.
PREVALENCE AND RISK FACTORS FOR HEPATITIS C IN THE HEALTH IN MEN (HIM) COHORT

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We aimed to determine the prevalence and risk factors for hepatitis C virus (HCV) infection in a cohort of HIV negative homosexual men in Sydney.

HIM is a longitudinal study of HIV-negative homosexual men in Sydney. Participants recruited in 2001 and 2002 were offered HCV testing using stored serum collected at baseline interview. HCV sero-status was determined by ELISA testing (AxSYM). All positive and indeterminate (i.e. weak positive and equivocal) results underwent supplementary ELISA testing (Murex), and all indeterminate results underwent qualitative HCV RNA testing by PCR.

Nine hundred and three men were enrolled in 2001 and 2002, and 824 (91%) consented to HCV testing. Seven men tested positive, giving a sero-prevalence of 0.9%. All men who tested positive to HCV reported undergoing HCV testing before, and only one man was unaware of his HCV positive status. HCV seropositivity was strongly associated with a history of injecting drug use (IDU, OR=60.4, 6.7-544.8), but not with body piercing and tattooing. However, the only HCV positive man who did not report IDU reported a history of both tattooing and body piercing. There was no significant relationship with number of lifetime male sex partners.

Hepatitis C prevalence is low among HIV negative homosexual men in Sydney, and HCV positivity is strongly associated with injecting drug use. This study finds no evidence of sexual transmission of HCV among HIV negative homosexual men.
HEPATITIS C & CULTURAL DIVERSITY IN WESTERN SYDNEY AREA HEALTH SERVICE (WSAHS)

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The creation of an Area Multicultural Hepatitis C Project Officer Position was the first of its kind in any NSW Health Service.

This project seeks to create awareness about Hepatitis C among CALD communities, Ethnic Health Care Workers, General Practitioners and to establish workable partnerships between Hepatitis C Services and various Multicultural Health Services, based on existing/available data and a needs analysis report.

The implementation of the various modules uses an “Advisory Committee” approach with evaluation strategies incorporated to measure the impact of deliver.

Presentation will show exhaustive research that went into acquiring relevant data to reflect the spread of Hepatitis C amongst top three communities resident in western Sydney Area with process/findings summarized and documented.

NATIONAL SURVEILLANCE OF HEPATITIS C VIRUS INFECTION IN AUSTRALIAN CHILDREN

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The incidence and natural history of HCV in an Australian paediatric population are unknown. This study aimed to characterise the epidemiology, natural history of HCV infection clinical management of children of hepatitis C in <15 years of age.

Clinicians who are on the Australian Paediatric Surveillance Unit (APSU) mailing list were asked to notify HCV positive cases and complete a written de-identified questionnaire during January 2003 to May 2004. Newly identified cases that fulfilled the inclusion criteria were sent a follow up questionnaire seeking further information.

Of the 31 paediatric HCV notifications, made between January 2003 and May 2004 45% (n=14) were classified as newly diagnosed cases. Of these, 4 notifications were from NSW and Victoria, 3 from South Australia, with the remainder from Western Australia, Queensland and Tasmania. Gender was evenly distributed between male and female, and most children reportedly born in Australia (85%, n=12/14). The principal HCV risk factors were infants born to a HCV RNA positive mother (n=12) or children reporting a history of injecting drug use (n=2). Of the children who were infected vertically, 66% (n=8/12) were born to viremic mothers reporting a history of injecting drug use. Children were tested for anti-HCV and HCV RNA and diagnosed at a median age of 4.2 years (S.D.5.4 years). Clinically, most children were asymptomatic (n=12), one child had lethargy and one child having hepatomegaly. Transaminase levels were slightly elevated (n=6/9) with ALT and AST having a median value of 105 iu/ml (S.D.118) and 53(S.D. 70) respectively.

Cross matching of cases using an alternate source of de-identified surveillance data will be considered, to compare the notification rate and ascertain a clearer epidemiological pattern of HCV incidence in children.
P46
COMPARISON OF GENOTYPES DETERMINED FROM THE 5'UTR AND CORE-ENVELOPE REGIONS OF HEPATITIS C VIRUS

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Hepatitis C virus (HCV) is a significant cause of chronic liver disease world-wide and the incidence of infection is rapidly rising. There is considerable diversity amongst HCV isolates, with deep lineage divergences of up to 30%, dividing the strains into at least 6 (and putatively 11) types each with further subtypic divisions of >15% divergence, based on whole genome sequences. Within the genome there are regions that are highly conserved eg. 5'UTR (2-7% divergence between types, >2% between subtypes), and those that are much less conserved eg. N5B, core and envelope genes (10-23% between types, >8% between subtypes). This paper compares nucleotide sequences of the 5' untranslated region (5'UTR) with the core-envelope region (corenv) to determine the congruence between genotypes determined from each region and looks at the distribution of genotypes and subtypes in the South Australian HCV positive population. HCV RNA extracted from sera from 137 South Australian patients who had been previously genotyped by nucleotide sequencing a 253 base pair (bp) 5'UTR PCR product were retested by sequencing a 494 bp corenv PCR product. Five of 6 genotypes were represented (no genotype 5 samples were detected in SA). Sequences were compared to subtype whole genome references sequences from Genbank. 5'UTR and corenv sequences from all 137 samples were concordant with one exception. The genotype of the exception could not be determined by phylogenetic analysis from the 5'UTR region, but was genotype 4 by corenv. There were eight samples that had corenv sequence differences of greater than 25% from the nearest published sequences. There is a high level of concordance between genotypes determined from the 5'UTR and corenv regions. Because the corenv region is more variable than the 5'UTR, it is possible to distinguish samples at a subtype level. The HCV positive population in South Australia is highly variable, representing all genotypes except Type 5, and representing subtypes 1a,b, 2a,b,c, 3a,b, 4a,d, 6a. There are eight samples that require further investigation.

P47
REVIEW OF THE HEPATITIS C SURVEILLANCE STRATEGY: IDENTIFYING THE GAPS

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Hepatitis C is one of the most common notifiable diseases in Australia, with around 200 000 cumulative notifications to the end of 2003 and continuing high levels of new infections. In 1994 a National Action Plan for dealing with the hepatitis C epidemic was established and the first National Strategy for Hepatitis C 1999-2000 to 2003 –2004 was launched in 2000.

The National Hepatitis C Surveillance Strategy was developed in 1999, with implementation overseen by the National Viral Hepatitis Surveillance Committee. The major objectives of the Strategy are to monitor hepatitis C incidence, prevalence and long term outcomes.

Key areas of hepatitis C surveillance have been sentinel surveillance among high-risk (injecting drug users) and lower risk (sexual health clinic attendees, blood donors, defence force recruits) groups. The annual needle syringe program (NSP) survey has provided internationally recognised monitoring of risk behaviour, HIV and hepatitis C prevalence among injecting drug users. Some monitoring of HCV incidence among high-risk group has been undertaken, however this has been relatively limited. Enhanced surveillance for acute and newly acquired hepatitis C has also been comparatively limited in coverage, although some jurisdictions have provided comprehensive data. Monitoring of long-term outcomes of hepatitis C has only been undertaken through data collected on liver transplantation.

Areas that require further input include:

• Population-level prevalence estimates, such as could be provided by a national blood survey
• Estimates of current hepatitis C incidence among high-risk populations
• Estimates of population level incidence, supported by improved estimation of injecting prevalence
• Estimates of advanced liver disease

Although there have been many areas of the Hepatitis C Surveillance Strategy that have been adequately addressed, surveillance systems should be enhanced to provide improved estimates of current and future burden of hepatitis C is Australia.
P48
THE PREVALENCE OF HEPATITIS C IN 2112 PATIENTS UNDERGOING ENDOSCOPY IN AN AUSTRALIAN HOSPITAL AND THEIR RISK FACTORS FOR INFECTION

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Our aim was to determine the prevalence of current and past hepatitis C infection in endoscopy patients and to relate this to risk factors for exposure.

Serum samples were tested for anti-HCV by Cobas Core II system (Boeringer Mannheim/Hoffmann la Roche, USA) and anti-HCV positive patients were tested for HCV RNA by in house RT PCR. A risk factor questionnaire was administered and the results were analysed using the SAS statistical package.

In the 2112 patients tested for hepatitis C, 4.7% (100/2112) were positive for anti-HCV antibody of these 52% (48/92) were viraemic. 27% of the HCV patients were previously unaware of their status.

Hepatitis C infection, on univariate analysis, was significantly associated with age, blood transfusion (when, where, the indication), administration of clotting factors, injecting drug use (and when), tattoo (when, where, and by whom), body piercing (and where), acupuncture (and when), household contact with hepatitis (when, and relation with case), household contact with HIV (and when), residence in a corrective or military institution (and how long), work in health care, having a chronic illness (and when), past diagnosis with hepatitis and whether the patients was immune suppressed.

On multivariate analysis, hepatitis C infection, remained significantly associated with place of birth, blood transfusion, ever having injected drugs, tattoo and acupuncture and when they were done, when the patient lived with someone diagnosed with hepatitis, ever having lived with someone with HIV, receiving a blood-product and to be diagnosed with hepatitis in the past.

P49
HBV HCV CO AND SUPERINFECTION IN VIETNAMESE AUSTRALIAN INJECTING DRUG USERS

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Superinfection and co-infection with hepatitis B (HBV) has been implicated in the progression of liver disease associated with chronic hepatitis C (HCV) infection. We examined the prevalence of HBV vaccine immunogenicity, HBV HCV superinfection and HBV HCV co-infection in a cross section of Vietnamese Australian injecting drug users recruited in a street drug market setting in Melbourne.

127 Vietnamese Australian IDU were recruited. Of these 100 (81%) tested positive for hepatitis C antibody (HCV Ab), 88 (61% of the study sample) of whom also tested positive for hepatitis C ribonucleic acid (HCVRNA). Therefore 12 HCV Ab positive had cleared the virus to undetectable levels of HCVRNA.

75 (59%) of individuals tested positive for hepatitis B core antibody (HBcAb) indicating previous infection with HBV. 61 (48%) of the individuals tested positive for both HBcAb and HCVA indicating previous super infection. 15 (12%) tested positive for hepatitis B surface antigen (HBsAg) indicating current infection with HBV. 39 (31%) tested positive for hepatitis B surface antibody (HBsAb) and negative for HBcAb indicating previous immunization.

Only 33% of the study group had had exposure to HCV alone (HCVA positive, HBcAb negative) and only 11% to HBV only (HCVA negative, HBcAb positive).

Of the group of 88 who were currently infected with HCV (HCVRNA positive), 11 (12.5%) tested positive for HBsAg positive indicating intercurrent hepatitis B and C infection. Thus 9% of individuals could be considered co infectious for HBV and HCV.

The high prevalence of exposure to HBV given the presence of a reliable vaccine is alarming. The high prevalence of HBV exposure in individuals with concomitant chronic HCV has implications for the progression of liver disease in these individuals. That 9% of IDU were currently infectious for both HBV and HCV emphasizes the importance of reducing both sexual and injecting related risk behaviour in this group. The opportunistic immunization of IDU is a high priority and IDU should be routinely tested for indicators of chronic HBV infection.
P50
IMPROVED MENTAL HEALTH IN A COHORT OF PEOPLE WITH OR AT RISK OF HEPATITIS C ENROLLED IN A HEALTH CARE PROGRAMME

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C-CLEARLY is a community-based programme offering an holistic approach to health care for people in South Australia, with or at risk of acquiring hepatitis C virus (HCV). The programme offers care coordination, education, advice and advocacy for participants and General Practitioners (GPs) through a Project Officer, and access to Dietician and Psychologist services. On entry to the programme, participants complete an extensive survey including the SF36, Zung Depression Scale, PrimeMD Depression, Anxiety, Eating, Panic and Alcohol scales and a symptoms list. Participants are reviewed and surveyed again after a minimum of 12 months.

C-CLEARLY has reviewed 45 people. 38 are HCV antibody (Ab) positive, 7 Ab negative. There are 28 males and 17 females.

Current depression scores on the Zung scale have improved in 27 participants and deteriorated in 17 participants. Mean improvement is 10.1 points (range 1.25-36.25), mean deterioration 5.8 (range 1.25-18.75). Recent panic attacks had occurred in 3 people at review compared to 10 at enrolment. 3 people fitted the criteria for Generalised Anxiety Disorder at review compared to 7 at enrolment.

34 of the reviewed participants have a GP. 23 of these had improved, 20 of these reported that their GP felt caring and understanding towards people at risk of HCV. 25 of the 34 reported their GP’s knowledge of HCV as fair or poor.

These review findings suggest that the mental health of people with, or at risk of acquiring HCV infection, may be improved by a programme that addresses psychosocial problems in a holistic manner. The findings also suggest that the attitudes of GPs are a factor in improving mental health in people with, or at risk of HCV infection.

P51
A COURSE IN HEPATITIS C FOR REGISTERED NURSES

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In response to the epidemiology findings related to Hepatitis C and approaches from registered nurses and other stakeholders, Sydney Hospital and Sydney Eye Hospital (SHSEH) developed a Course to meet the needs of registered nurses working with Hepatitis C positive patients. Registered nurses identified in NSW Health’s Hepatitis C Strategic Plan were targeted and these included those employed by Corrections’ Health Services, site specific drug and alcohol services, inpatient/outpatient services within hospitals throughout metropolitan and rural NSW, Aboriginal communities and Non English Speaking and English as a second language members of the community.

Key registered nurses with extensive experience in the clinical management of Hepatitis C positive individuals were approached to participate as members of the Curriculum Development Committee. The members of the committee envisaged that a Course of this nature has the potential to assist NSW Health’s Hepatitis C Strategic Plan achieve its stated key goals. These goals include to, minimize the transmission of Hepatitis C, maximize the health status of people infected with the Hepatitis C virus, minimize the negative health, social and economic impact of Hepatitis C. This project was enthusiastically embraced by both the Clinical Nursing Services Department, SHSEH and the Members of the Curriculum Development Committee.

The major focus of the presentation, after a brief review of the development and implementation of the Course, will be a discussion of the biographical and employment registered nurses who participated and the outcomes of their formative and summative evaluation of the Course.
P52
THE HCV VIRAL LOAD IS INCREASED IN A MAJORITY OF HIV/HCV CO-INFECTED INDIVIDUALS TREATED WITH ANTI-RETROVIRAL THERAPY

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The major transmission routes of HIV and HCV differ (sexual v. parenteral), but since HIV can be transmitted by the parenteral route, a proportion of HIV-positive individuals is also HCV positive. The HIV/HCV co-infected cohort represents around 30% of all HIV-positive patients in the USA, Europe and Australia. These patients often show accelerated rates of liver disease compared with HCV mono-infected individuals, in whom HCV-related liver disease is thought to result from a cell mediated immune response. On the other hand, prior to the introduction of highly active antiretroviral therapy (HAART), many patients did not live long enough to develop significant liver disease. The introduction of HAART has significantly reduced the morbidity and mortality in individuals infected with HIV. As a result, the immune reconstitution following HAART might be predicted to lead to a reduction in the HCV viral load and to improvements in the liver disease. However, HAART-treated HIV/HCV co-infected individuals have increased morbidity and in some populations, increased mortality associated with liver disease.

We performed a retrospective study to examine the HCV viral load in stored serum samples from HIV/HCV co-infected patients who initiated HAART. The viral load was measured prior to and after the initiation of HAART, and was correlated with CD4+ cell counts, HIV viral load and ALT as a measure of liver injury. The data were alarming and show that the HCV viral load increased in 26/51 patients examined. The increase ranged from 2-fold to 3000-fold. These increases were not always accompanied by increased ALT levels. In contrast, the HIV viral load decreased in 45/51 patients and correlated with increased CD4+ T cell levels. Optimum management of both HIV and HCV infections demand an understanding of the pathogenesis of liver disease in HAART-treated HIV/HCV co-infection.

P53
IMPROVING PATIENT CARE VIA ELECTRONIC MEDICAL RECORDS (EMR)

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The AW Morrow Gastroenterology and Liver Centre is the quaternary referral centre for liver disease in NSW. It is based at RPAH and the National Liver Transplant Unit is part of the service. A large percentage of the patients have hepatitis C or B. Many of the patients have advanced liver disease and require care from a multitude of care providers within the hospital.

To improve patient management, and to improve existing business processes, the service is developing an electronic medical record (EMR) system in partnership with CSAHS-Information System Department (ISD). Currently, patient information is kept in a variety of formats in liver clinic files, medical records and other paper files. Only some test results are held electronically. This system is inefficient and limits access to patient information. The Liver EMR is one part of CSAHS Electronic Medical Record Vision, it will be rolled out to other hospital sites across CSAHS.

For the first time nutritional assessment, social work reports, clinical notes, drug and alcohol assessments, endocrine assessments, transplant care and test results will be integrated into one record. This will enable a more wholistic approach to patient monitoring and treatment and improve communication between care providers.

The service also conducts extensive research into hepatitis C and other liver diseases. An extension of the final phase of the project will include the linking of research databases to the system to improve research outcomes.

The Liver EMR Project commenced in January 2004 and has been divided into five phases. They are Project Planning, Business Analysis and Development, Database Design and Development, End-User Training, and The Implementation Phase.
P54
DEVELOPING A NURSING PROTOCOL FOR EXTERNAL JUGULAR VENEPUNCTURE IN HEPATITIS C PATIENTS WITH DIFFICULT VENOUS ACCESS

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The AW Morrow Gastro and Liver Unit provides services to patients requiring management and treatment of Chronic Hepatitis C. The hepatitis C Clinical Nurse Consultants case manage all patients undergoing anti-viral therapy. Patients undergoing therapy require frequent clinic visits and blood testing in order to monitor treatment progress. A significant number of patients have difficult venous access and unable to have blood drawn from conventional sites. These patients are currently referred to an Anaesthetist for review and ongoing venepuncture. Blood is usually taken from the external jugular vein. We have experienced no complications with the procedure. All patients report high levels of satisfaction with the technique.

The number of patients requiring this type of procedure is increasing. As it is often difficult to access the anaesthetist during clinics we have developed a proposal for the clinical nurse consultants to undertake drawing blood from the external jugular vein. We believe we are the first clinic to develop such a protocol.

This presentation will give background to the development of the protocol, outline the procedure and discuss the accreditation process within the hospital.

From anecdotal reports we have found patients may be denied anti-viral therapy because of difficulties with venous access therefore we believe this is an important advance in managing patients on anti-viral therapy.

P55
THE WAY AHEAD – THE INTRODUCTION OF THE NURSE PRACTITIONER IN HEPATITIS IN WA

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The continuing development of health care practices and rising health care costs have contributed to a rapid proliferation in nurse practitioner services. Nurse practitioners have been established in the United States of America for several decades with the first nurse practitioner commencing practice in primary care in 1965. The original goal of the nurse practitioner role was to augment services due to the perceived shortage of primary care physicians.

Today, nurse practitioners have the opportunity to work collaboratively with physicians to optimise patient care. They practise in various countries and within diverse specialties.

In Australia, the role of the nurse practitioner has been under development in most of the Australian states and territories over the past ten years with the registration of the first nurse practitioner in NSW in 2001.

In Western Australia, with the introduction of the Nurse’s Amendment Act 2003, a way forward was created to formally introduce nurse practitioner into designated areas across Western Australia. The patient demographics in Hepatology are changing, becoming more complex, specialised and increasing in numbers.

The implementation of nurse practitioner roles in Viral Hepatitis will enable nurses with extensive experience and expertise to practise their advanced skills within a scope of practice that will further ensure the quality of nursing care and contribute to positive health outcomes. The nurse practitioner will be responsible for co-ordinating and providing effective leadership through a clinical consultancy.
REGULATORY T CELLS IN CHRONIC HEPATITIS C INFECTION

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Helper T lymphocytes (CD4+) constitutively expressing cytokine-production of conventional T-cells. Recently, a possible role for these cells in the pathogenesis of chronic viral infections (HIV and CMV) was reported, with evidence for the induction of Treg which inhibit the antiviral immune response. The hypothesis underlying this work is that Treg activity in the blood and liver is an important determinant of the outcome of primary hepatitis C (HCV) infection and a determinant of viral control and liver injury in chronic HCV. The preliminary test of this hypothesis is being undertaken by assessing the number of Treg in the blood and liver of chronically infected patients, as well as testing of their suppressive function.

Stored, frozen PBMCs from 22 patients with chronic HCV and 10 uninfected control are being analysed by four colour flow cytometry for the expression of the surface molecules CD4, CD8, CD25, HLA-DR, CD45RO, GITR and a number of chemokine receptors. Preliminary data from a subset of these samples show that chronic HCV patients present CD4+CD25+ cells in percentages comparable to those of uninfected subjects.

Suppressive function of Treg cells on CD4+CD25+ FACS sorted cells, is being studied in co-cultures on CFSE proliferation assays, after non specific (PHA) stimulation of target cells. CD25+ populations from chronically infected patients contain Treg cells, which are capable of suppressing significantly the growth of both unsorted and CD25 depleted lymphocytes when co-cultured at 2:1 and 5:1 ratios. These Treg cells are able to suppress the proliferation of both CD4+ and CD8+ lymphocytes. Suppression of cytokine production will be analysed in culture supernatants by Bioplex.

Also, localization of Treg cells in the liver will be conducted in formalin-fixed paraffin-embedded biopsy tissue sections using immunohistochemistry.

FREQUENCY OF CELLULAR IMMUNE RESPONSES DIRECTED TO INDIVIDUAL HCV GENES IN CHRONICALLY HCV INFECTED INDIVIDUALS

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HCV-specific cellular immune responses have generally been found at a low frequency in the blood of individuals with chronic HCV. Previous studies have used proteins or peptides corresponding to small regions of the HCV genome, predominantly core and NS3, which may underestimate the frequency of these responses.

A total of 441 overlapping peptides (18-mers with 11 amino acid overlap) covering the entire HCV 1a genome (NIH AIDS reagent program) were grouped into pools corresponding to the 10 HCV proteins. Pools were used in an interferon-γ ELISPOT assay at a final concentration of 20μg/ml with 2x10^5 PBMCs/well. Negative control wells contained PBMCs in R+ with 1μl/mL of DMSO. Statistical analysis of data obtained from testing samples from 10 seronegative individuals determined that a positive response should be defined as more than 25 SFC/10^6 PBMCs above, and more than twice the number of spots, in the negative control wells. Assay validation was carried out on 4 seronegative and 4 chronically infected individuals, with inter-assay, intra-assay and inter-operator coefficients of variation (CV) below 15%.

Peripheral blood samples from 10 individuals with chronic HCV were assessed, with half (5/10) having positive responses to at least one peptide pool. Of these 5 individuals, 2 had responses to 4 separate peptide pools. The most common positive responses were detected to the core protein (4/10), followed by NS3, NS4b and NS5b (2/10). NS2 responses were found in 1 individual, while no positive responses were detected to E1, E2, p7, NS4a or NS5a. The peptides, which are based on the 1a genotype, were able to elicit responses in individuals infected with genotypes 1, 1a, 1b, 2b and 3a. The magnitude of positive responses averaged 132 SFC/10^6 PBMC (range 43-452).

This study, while preliminary, has demonstrated broad cellular immune responses to HCV in peripheral blood of a significant proportion of individuals with chronic HCV of a magnitude similar to that of other chronic viral infections. This contrasts with earlier studies which have suggested that the immune response in subjects with chronic HCV is relatively weak and of narrow specificity.
The 5’ untranslated region in the HCV genome contains an internal ribosome entry site (IRES) that directs the synthesis of the virus polyprotein in a cap-independent manner. To investigate the role of the HCV IRES domain IV in translation initiation and regulation, two chimeric IRES elements were constructed to contain the reciprocal domain IV in the otherwise HCV and classical swine fever virus (CSFV) IRES elements. One chimeric element, comprised of the HCV domains 1-3 and the CSFV IRES domain 4 (HCV 1-3/CSFV4), was not functional but the reciprocal chimera, CSFV1-3/HCV4 was functional in a monocistronic form, although the efficiency relative to wild type IRES was reduced. Uncapped RNA is not translationally competent in our hands. Nevertheless, it was important to demonstrate that the chimeric IRES could function as an IRES in a bicistronic vector. The efficiency was approximately 40% of wild type IRES. The reduced efficiency of the chimeric IRES might be explained by a change in the context of the AUG for the polyprotein and we showed by toeprinting analysis that the toeprint for the chimeric IRES and the HCV IRES were identical, indicating that the two AUG codons were positioned in a similar context.

This permitted an examination of the role of domain IV in the control of HCV translation. A specific inhibitor of the HCV IRES, vitamin B12, was shown to inhibit translation directed by all IRES elements which contained domain IV from the HCV and the GBV-B IRES elements, whereas the HCV core protein could only suppress translation from the wild type HCV IRES. Thus the mechanisms of translation inhibition by vitamin B12 and the core protein differ, and target different regions of the IRES.
P60 PERSISTENT IMMUNE DEFECTS IN PATIENTS WITH HIV AND HCV CO-INFECTION FOLLOWING LONG-TERM HAART

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With the introduction of highly active antiretroviral therapy (HAART) and the associated increase in life expectancy of HIV-infected patients, HCV-related morbidity and mortality is likely to become a significant clinical problem. HAART increases CD4 T-cell counts, suppresses HIV replication, reverses predominance of type 2 (T2) cytokines seen in AIDS and decreases levels of immune activation markers. The effects of HAART on cytokines and immune activation in HIV/HCV co-infected patients have not been established. We hypothesise that dysregulated production of T1 and T2 cytokines and immune activation is increased by HIV/HCV co-infection and persists after long-term HAART. Here, co-infected patients were compared with untreated HCV mono-infected patients and HCV patients receiving combination therapy. Duration of combination therapy was 6 months for HCV mono-infected patients with HCV genotype 2 or 3 and 12 months for patients with HCV genotype 1. Median (range) for duration of HAART in co-infected patients was 74 (18-85) months.

Levels of sCD30 (marking a T2 cytokine environment) in serum from HIV/HCV co-infected patients did not differ from untreated HCV mono-infected patients but were significantly higher than in HIV mono-infected patients, HCV mono-infected patients receiving combination therapy and healthy controls. Serum sCD26/DPPIV enzyme activity (marking T-cell activation) in HIV/HCV co-infected patients was similar to that seen in healthy controls but were lower than in untreated HCV mono-infected patients. Combination therapy decreased sCD26/DPPIV enzyme activity in HIV mono-infected patients, but levels remained higher than in healthy controls. Levels of LAG-3 (marking a T1 cytokine environment) and sTNF-RI in sera did not differ between the study groups. CD25 expression on CD4 T-cells (marking immune activation) was higher in HIV/HCV co-infected patients compared to untreated HCV patients. HLA-DR expression on CD4 and CD8 T-cells (marking immune activation) was higher in co-infected patients than untreated HCV patients, particularly in co-infected patients who had not received HAART.

Most HIV/HCV co-infected patients stabilised on HAART retain elevated serum sCD30 levels and CD25 expression on CD4 T-cells. Both may compromise the subsequent use of combination therapy for the HCV infection in co-infected patients.

P61 MICROARRAY ANALYSIS OF INTRAHEPATIC GENE EXPRESSION IN HCV RECURRENT POST LIVER TRANSPLANTATION

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Recurrence of HCV infection post liver transplant is universal but progression of disease is more progressive. The disease is characterized by high levels of viremia. The Aim of this study was to compare intrahepatic gene expression of CHI (Chronic HCV post transplant) to chronic hepatitis C pre-transplant (CH).

Gene Chip arrays were utilized to study pooled RNA from 22 liver biopsies; 8 patients with CHI, 8 patients with CH and 6 normal livers. Probe level data was analysed using the Bioconductor affy library and genes with >2 fold changes were considered to be up regulated.

CHI vs. CH: Compared to normal, both groups were characterized by up regulation of: genes involved in antigen presentation (Proteasome subunit 42, MDR3), T cell activation (T cell receptor and CTL-17), IFN-gamma inducible genes (IFN- 56KD, IP-10, Humig and class II MHC) and IFN-alpha associated genes (p27 and 2-5 OAS). However, compared to CH, the CHI group displayed increased expression of genes involved in cellular proliferation (PCNA, cyclin, beta integrin), apoptosis (cytotoxic c, Fas-L, caspase 4), inflammation (macrophage mannose receptor, complement factor H) and fibrosis (angiotensin II receptor, proteoglycan core protein) in addition higher levels of T cells genes and interferon gamma induced genes was seen.

Conclusions: At the transcriptome level, chronic HCV post transplant is characterized by an increased process of cellular proliferation, apoptosis and fibrosis compared to the pretransplant setting. Collectively the data suggest that the high levels of viremia, which characterize the post transplant setting, derive the immune response to act at a higher level. In addition, the up regulation of several IFN related antiviral genes supports the notion that HCV is a strong inducer of intrahepatic type I IFN, but it is relatively resistant to its antiviral activity.
A HEPATITIS B VIRUS SEQUENCE ANALYSIS PROGRAM FOR IDENTIFYING ANTIVIRAL-RESISTANT MUTANTS

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SeqHepB is a web-based program developed to analyse the viral genomic data of patients infected with hepatitis B virus (HBV). The program is able to analyse HBV DNA or amino acid sequences, determine the HBV genotype, identify key mutations associated with antiviral resistance, and identify clinically important HBV variants by comparing the sequence data with reference sequences. Examples of clinically important HBV variants include mutations within the HBV basal core promoter or precore gene; deletions within the Pre-S region; and vaccine escape mutants. In addition, multiple mutations within a HBV gene or a combination of mutations from other areas of the genome can act in a compensatory manner to alter the resistance profiles, replication fitness and pathogenesis profile. Thus, the cross-linking of viral genomic data is important.

The SeqHepB database currently holds the clinical, laboratory, and viral genomic data of over 1,000 patients, 10,000 laboratory results, and 45,000 HBV genomic variations. The database has been designed to enable rapid extraction of any combinations of clinical and virological data collected from patient cohorts for detailed analysis. An example of such studies includes a cohort of 18 patients who have undergone liver transplantation, and have been treated with hepatitis B immunoglobulin (HBIG) plus other antiviral agents including Lamivudine, and/or Adefovir. Analysis of the HBV polymerase and envelope genes revealed infections with genotype B (11%), C (17%), D (50%), A&D (17%), and A&C (6%). Nine patients were infected with clinically significant HBV variants that have mutations in the polymerase gene associated with Lamivudine resistance. Concomitant mutations in the overlapping reading frame encoding the envelope gene were also analysed. These mutations can disrupt the “a” determinant and also the C terminal region of HBsAg.

SeqHepB is an important tool that facilitates the identification of HBV drug resistance mutants and can allow the physicians to individualise patient management.
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