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# bulletin



Dr Jo Dickinson is Menzies' first Cancer Council Tasmania Research Fellow.

*Photograph courtesy of The Mercury.*

## First dedicated cancer research position for Menzies

The Menzies Research Institute and The Cancer Council Tasmania have announced the appointment of the first Cancer Council Tasmania Research Fellow.

Dr Joanne Dickinson has taken up the three-year, \$345,000 fellowship with the aim of strategically expanding work on cancer prevention and treatment at the Menzies Research Institute, Tasmania's premier health and medical research facility.

Menzies' Director, Professor Simon Foote said that Dr Dickinson is Menzies' first Research Fellow dedicated to cancer research. "Dr Dickinson is an excellent researcher with a strong record in research into the genetic and environmental causes of cancer.

"The appointment of Dr Dickinson, funded by The Cancer Council Tasmania, will help build critical mass in Tasmanian cancer research, maximising the potential of the state's unique resources and producing better outcomes for Tasmanians," he said.

Dr Dickinson heads the Menzies' current research program examining the genes and risk factors associated with the development of prostate cancer. Her research focus has recently expanded to include a study of the genetics of blood cancers such as leukaemia.

The Cancer Council Tasmania Chairman Stephen Foster said that this fellowship brings to over \$2.5 million the research funds raised by the

state's leading cancer control organisation in the past decade. "Medical research has led to great advances in our ability to diagnose, treat and prevent cancer. More than 50% of people diagnosed with cancer today will survive.

"However, despite these accomplishments, cancer still affects too many people. Around seven Tasmanians are diagnosed with cancer and three still die from the disease every single day," he said.

The Cancer Council Tasmania has funded around 100 research projects in its 11 years on issues ranging from cancer risk factors and new treatment options through to treatment side effects.

"Menzies welcomes this partnership with The Cancer Council Tasmania as we work together for a healthier future," Professor Foote said.

# Menzies research efforts boosted

The Menzies Research Institute has significantly increased in size with the announcement of the first members who have been appointed to the Institute as the next step in Menzies' exciting growth strategy.

Professor Simon Foote, Director of the Menzies Research Institute, says twenty of Tasmania's most highly respected health and medical researchers have been named as Menzies' first members and senior members.

Menzies has also appointed a second Deputy Director, Professor James Vickers, Head of the Discipline of Pathology at the University's School of Medicine.

"The first members of Menzies will bring

Menzies will be able to enhance collaborations across research areas and ensure that the depth and high quality of our research is enhanced and strengthened.

"By welcoming members from other parts of UTAS, the current areas of research at Menzies will be significantly expanded. Some of the new themes which will complement Menzies' current work include neuroscience, diabetes and insulin research, respiratory medicine and clinical research.

"One of the advantages of operating a medical research institute in Tasmania is the close association we can foster with hospitals and clinicians. Through

who will commence in the coming year," he said.

"Through these initiatives for growth, the Menzies will be on a par with some of Australia's most eminent medical research institutes. This is an exciting time for the Menzies Research Institute, and we are grateful for the support we are receiving from the Tasmanian community," Professor Foote said.

The first **Senior Members** of the Menzies are:

- Associate Professor Leigh Blizzard
- Associate Professor Inn Chuah
- Professor Michael Clark
- Professor Simon Foote
- Professor Graeme Jones
- Professor Mark Nelson
- Professor Anne-Louise Ponsonby
- Associate Professor Steve Rattigan
- Associate Professor Alison Venn
- Professor James Vickers
- Professor Haydn Walters and
- Associate Professor Adrian West.

The **Members** are:

- Dr Roger Chung
- Dr Tracey Dickson
- Dr Changhai Ding
- Dr Adele Holloway
- Associate Professor David Johns
- Dr Stephen Richards
- Dr Jane Zochling and
- Associate Professor Greg Woods.

Menzies has also appointed key collaborators as **Honorary Members**.

These are:

- Professor Don Chalmers
- Professor Terry Speed
- Dr Melanie Bahlo and
- Professor Jeff Summers.



Professor James Vickers is Menzies' second Deputy Director

with them their own teams of researchers, students and support staff, swelling staff numbers at the Institute and adding momentum to our research efforts," Professor Foote said.

The Menzies Research Institute has implemented a membership model as part of a growth strategy for health and medical research at the University of Tasmania (UTAS).

"With our new membership model, the

Menzies' new structure we are forging closer links between researchers who study the basic biology of disease and clinical researchers.

"The new Menzies also offers an attractive environment for the recruitment of world-class biomedical researchers to Tasmania. The Institute's expanded resources and new research themes have already enabled us to recruit three internationally renowned researchers,

## *Congratulations to...*

*Menzies staff who have had their research success recognised with academic promotions!*

*Leigh Blizzard is now an Associate Professor, and Steve Richards and Adele Holloway have been promoted to Senior Research Fellow level.*

# Literacy Pathways: Thank you!

In March this year we asked our committed supporters to financially contribute to a new study which examines the link between vision coordination problems and low literacy in Tasmanian school children.

As a result of your generous support, the Literacy Pathways project has had a very busy and successful year, screening 640 children in 75 schools in southern Tasmania for problems coordinating both eyes to read visual images.

Eighty-nine children who were found to have problems with their binocular vision agreed to participate in an educational trial. They were assigned to one of three reading support programs designed to improve their literacy.

One group of children has completed the ten-week program, and the second and third groups will be finished before Christmas.

As a result of the generous donations received from Menzies supporters, two psychologists were employed to independently assess several measures of child attention, eye functioning and literacy before and after each child's participation in the trial. Children will also undergo a six-month assessment to test any long-term changes as a result of the trial.

Once all of the data has been collected, the researchers will begin to evaluate and analyse the results of the trials. Findings will be published in medical and educational journals.



Many thanks to the donors who have supported us in our quest for new approaches to assist children with poor literacy!

## Calcium supplements don't prevent bone fractures in children

Researchers at the Menzies Research Institute have found that calcium supplements have very little benefit for preventing fractures in childhood and later adulthood in a review which was published recently in the prestigious *British Medical Journal*.

Children taking such supplements have only small improvements in bone density, which are unlikely to reduce fracture risk, and other approaches could be more beneficial such as increasing vitamin D concentrations and eating more fruit and vegetables.

The researchers analysed the findings of 19 different studies involving 2,859 children collectively aged between three and 18.

Dr Tania Winzenberg said that they found there was a small effect on total body

bone mineral content and upper limb bone mineral density – children taking the supplements only had 1.7% better bone density in their upper limbs than children not taking the supplements.

“However, there was no effect at important sites in the body for fracture in later life – namely the hip and lumbar spine. After children stopped taking calcium supplements, the effect persisted at the upper limb, but disappeared for total body bone mineral content,” she said.

Osteoporosis is a major public health problem, particularly in women, and low bone mineral density is an important risk factor for osteoporotic fractures. Bone density worsens for women after the menopause, so intervention in childhood to maximise peak bone mass by improving factors such as diet and physical activity can minimise the impact of bone loss related to age.

“The small effect of calcium supplementation on bone mineral density in the upper limb is unlikely to reduce the risk of fracture, either in childhood or later life, to a degree of major public health importance. It may be appropriate to explore alternative nutritional interventions, such as increasing vitamin D concentrations and intake of fruit and vegetables,” Dr Winzenberg said.

## ICON funding renewed

The Tasmanian Government has recognised Menzies' status, achievements and place in the Tasmanian community by awarding funding under the Tasmanian Icons Program since December 2000. The Menzies Research Institute is one of three Icons named under this initiative. The Tasmanian Symphony Orchestra and the Tasmanian Tigers cricket team have also been given Icon status. The Premier, Paul Lennon, recently confirmed his commitment to Menzies' Icon status for a further three years until June 2009.

The significant funding that comes to Menzies from the Icon program has allowed investment in a number of strategic areas, including a genetic epidemiology program and business development activities. This has allowed Menzies to continue to grow and conduct local research that is globally significant. During its six years of Icon status Menzies has more than doubled both its staffing levels and its income from research grants.

## Yes, I would like to help the Menzies Research Institute

I would like to make a one-off donation of \$ \_\_\_\_\_

I would like to have monthly donations of \$ \_\_\_\_\_  
deducted from my credit card.

All donations over \$2 are tax deductible.

### Please complete the following details:

Title: Mr / Mrs / Miss / Other \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

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Telephone: (    ) \_\_\_\_\_

Email: \_\_\_\_\_

### Please accept my donation/s in the form of:

Cash     Cheque/Money Order\*

\*Payable to the Menzies Research Institute

### OR

### Please debit my:

Visa     MasterCard     Bankcard

Credit Card No.: \_\_\_\_\_

Expiry Date:        / \_\_\_\_\_

Name on card: \_\_\_\_\_

Signature: \_\_\_\_\_

I/We wish that my/our donation be used for research purposes at the discretion of the Menzies Research Institute, unless a particular research purpose is stated as follows:  
\_\_\_\_\_

Please do not publish my name in the 'Valued Supporters' section of Menzies' next Bulletin.

Please send me information on remembering Menzies in my Will.

### Thank you for your support.

Please post to: Menzies Research Institute  
Private Bag 23 Hobart TASMANIA 7001

Menzies Research Institute

## Valued supporters (August - October 2006): We thank our supporters for their generous contribution



The Menzies Research Institute wishes to acknowledge the following businesses for their support and commitment to the 2006 Art of Christmas:

### Artists

Carmel Burns  
Nigel Lazenby  
Rebecca Murdoch  
Michael Weitnauer  
Stewart Wells

### Sponsors



Spicers Paper



### Supporters

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Lions Club of Clarence  
Inc Tas

Eastern Audiology Services  
Bride of the Year Parade

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Mr & Mrs W & K Alexander  
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### Lasting Legacy

Gifts of remembrance have been made in honour of:

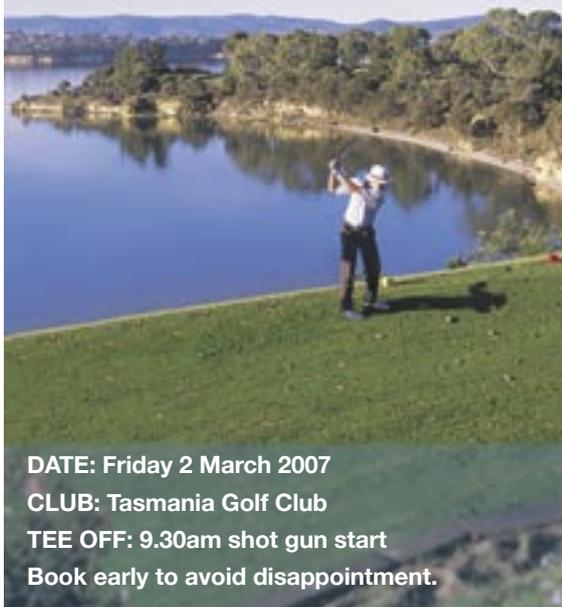
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Mrs Margaret Rostron

The Menzies Research Institute is also deeply indebted to those generous donors who wish to remain anonymous.



Menzies  
Research  
Institute

# 2007 golf Classic



**DATE:** Friday 2 March 2007  
**CLUB:** Tasmania Golf Club  
**TEE OFF:** 9.30am shot gun start  
**Book early to avoid disappointment.**

## The Menzies Research Institute invites you to attend our 2007 Golf Classic, presented by Corporate Express Office Equipment.

The 2007 Golf Classic promises to be an enjoyable day for all participants, building on the success of the 2006 event. Teams can enjoy the company of a celebrity caddy, indulge in quality food and beverages as they complete the course, and relax with colleagues and friends in the Club House at the end of the day.

The event will this year raise much-needed funds to support the education and training of the medical researchers of the future. Funds will be directed into scholarships for Tasmania's brightest young science and medical graduates to embark on research careers with the Institute.

For more information on the 2007 Golf Classic visit Menzies' website [www.menzies.utas.edu.au](http://www.menzies.utas.edu.au) or phone Communications and Events Coordinator Jill Butterworth on 6226 7751.

On the website you will find details of celebrity caddies, sponsors and special guests, rules of four-person Ambrose Golf, sponsor information and breaking Golf Classic news. The Golf Classic is fast becoming one of Hobart's premier corporate fundraising events. Places are limited, so register your interest today!

## 2007 Menzies Research Institute Golf Classic presented by Corporate Express Office Equipment

### Team of 4 \$220

*(Please indicate club handicap level if applicable).*

Player 1 \_\_\_\_\_  
club handicap  or no handicap

Player 2 \_\_\_\_\_  
club handicap  or no handicap

Player 3 \_\_\_\_\_  
club handicap  or no handicap

Player 4 \_\_\_\_\_  
club handicap  or no handicap

### Individual Entry \$60

Name \_\_\_\_\_  
club handicap  or no handicap

Total amount payable: \$ 60  \$ 220

Unfortunately I am unable to attend, but please find enclosed my donation of \$ \_\_\_\_\_ for medical research.

Mr/Mrs/Ms/Other: \_\_\_\_\_

Surname: \_\_\_\_\_

First Name(s): \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Postcode: \_\_\_\_\_

Telephone: (    ) \_\_\_\_\_

Email: \_\_\_\_\_

Method of payment:

Cheque/Money Order (Payable to Menzies Research Institute)

OR  Cash  Visa  MasterCard  Bankcard

Card No:            /            /            /

Expiry Date:            /

Name on card: \_\_\_\_\_

Signature: \_\_\_\_\_

## Silent Caddy Auction

Details of celebrity caddies available can be found on the 2007 Golf Classic page of the Institute's website:

[www.menzies.utas.edu.au](http://www.menzies.utas.edu.au)

I would like to bid for this caddy: \_\_\_\_\_

Bid amount: \$ \_\_\_\_\_ (minimum bid \$50).

I will be bringing my own caddy (\$20).

Please return your registration form to:

2007 Golf Classic  
Menzies Research Institute  
Private Bag 23 Hobart  
TASMANIA 7001  
or Fax: 03 6226 7704

Proudly presented by:



Major Sponsors:



# Competitive grants success

The Menzies Research Institute will benefit from more than a million dollars in research funding from the National Health and Medical Research Council. The funding was announced by Minister for Health and Ageing, Tony Abbott and is part of \$529 million in health and medical research funding awarded by the Commonwealth government to medical research institutions around the country in 2006.

Professor Graeme Jones was awarded a prestigious \$340,000 NMHRC Practitioner Fellowship, intended to assist experienced and productive clinical and public health researchers who wish to maintain both a research and a professional career. Professor Jones practises as a rheumatologist and maintains a comprehensive program of research at the Menzies Research Institute.

Dr Tracey Dickson and Professor James Vickers were awarded \$310,250 to investigate the function of a protein identified in patients with Parkinson's disease. The protein, known as alpha-synuclein, is accumulated in specific

types of nerve cells in the brain. It is hoped that this study may lead to development of new therapeutic agents for the treatment of Parkinson's disease and other neurodegenerative disorders.

Type two diabetes has a high incidence in people with low physical activity levels and high fat diets, but it can also be the result of muscle insulin resistance. Professor Michael Clark and his team are investigating how insulin controls capillary recruitment in muscle. A grant of \$417,750 will fund new research to enhance understanding of insulin action, and may lead to new treatments for type two diabetes.

Menzies will also receive funding from the Australian Research Council for new work that aims to help patients who have a brain injury or a neurodegenerative disease. Dr Roger Chung and his colleagues are looking at astrocytes, a type of cell which detects injury to the central nervous system. They will examine a protein called extracellular metallothionein, which has been shown to affect the behaviour of these cells and promote recovery following brain injury.

## the Art of Christmas 2006

Christmas arrived early this year for Menzies, with the launch of the 2006 Art of Christmas at Wrest Point on 20 September. Art pieces donated by five Tasmanian artists were showcased at an elegant cocktail function in the Derwent Room, which was festooned in silver and white. Harp and flute duo 'Spiral Trance' provided entertainment and ambience while guests viewed the original art, sipped cocktails, nibbled canapes and met the artists.

Six art pieces have been reproduced into Menzies' 2006 Art of Christmas card range. The cards are now available for purchase from reception at the Menzies Research Institute and at the Combined Charities Christmas Card and Gift Shop in Hobart.

Several of the original artworks are still



Artist Carmel Burns with her husband Tony Smibert

available for purchase, including paintings by Michael Weitnauer and Carmel Burns. All of the proceeds support medical research at the Menzies Research Institute.

For more information on purchasing Christmas cards or an artwork, consult the website at [www.menzies.utas.edu.au/artofchristmas.html](http://www.menzies.utas.edu.au/artofchristmas.html) or phone Menzies on 6226 7700.

## Grants

The following grants have been awarded to the Menzies Research Institute since the last issue of the Bulletin.

**Australian Research Council - Linkage Grant.** \*Chung RS, \*West A, \*Chuah MI. **Identifying the specific structural features of metallothionein that regulate its ability to modulate astrogliosis. \$303,000**

**National Health and Medical Research Council.** \*Clark MG, \*Rattigan S, \*Richards SM, Choi-Lungberg DL. **Central and peripheral actions of insulin for the control of muscle capillary recruitment. \$417,750**

**The Max Bruce Trust – A Charitable Discretionary Trust administered by Peter Worrall Lawyers.** \*Dickinson JL. **The Tasmanian prostate cancer genetics study. \$89,100**

**National Health and Medical Research Council.** \*Dickson TC, \*Vickers JC. **The neuroprotective properties of alpha-synuclein. \$260,250**

**National Health and Medical Research Council.** \*Jones G. **Practitioner Fellowship. \$340,000**

**Australian Rotary Health Research Fund, Mental Health Research Grant.** \*Sanderson K.

**Reducing the individual and societal burden of mental health problems in working adults: a longitudinal analysis. \$33,205<sup>†</sup>**

<sup>†</sup>Funds transferred from Queensland University of Technology.

**Department of Foreign Affairs and Trade, Australia-Thailand Institute.** \*Stankovich J; \*Thomson RJ.

**A course in computational and statistical skills for medical genetics researchers. \$6,000**

**Motor Neurone Disease Research Institute of Australia Inc, Grant-In-Aid.** \*Vickers JC; King AK; \*Dickson TC; \*Chung RS; \*West AK; \*Chuah MI.

**Unravelling the cellular pathology underlying neuronal degeneration in motor neuron disease. \$24,743**

**Royal Australian College of General Practitioners, Cardiovascular Research Grants.** \*Winzenberg TM.

**The assessment of physical activity in general practice. \$24,848**

\*Menzies researchers.

# Publications

The following papers from the Menzies Research Institute have been published since the last issue of the Bulletin.

\*van der Mei IA, \*Blizzard L, \*Ponsonby AL, Dwyer T. [Validity and reliability of adult recall of past sun exposure in a case-control study of multiple sclerosis.](#) *Cancer Epidemiology Biomarkers Prevention* 2006;15(8):1538-44.

Measurement of past sun exposure through recall by adults has the potential for measurement error. This study aimed to investigate aspects of validity and reliability of self-reported past sun exposure. A population-based case-control study was conducted in Tasmania on 136 cases with multiple sclerosis and 272 age- and sex-matched community controls. Repeat interviews on 52 cases and 52 controls were done on average 11 weeks after the initial interview. Sun exposure was assessed by questionnaire and lifetime calendar. Other measurements included serum 25-hydroxyvitamin D, actinic damage, and skin phenotype. The results of this study provide evidence that adults are able to recall past sun exposure with shown validity and reliability and present information about the possible reasons for the good reliability of recalled sun exposure measures.

\*Ding C, \*Jones G. [Anti-interleukin-6 receptor antibody treatment in inflammatory autoimmune diseases.](#) *Reviews on Recent Clinical Trials* 2006;9(1):193-2006.

Tocilizumab is under development for the treatment of inflammatory autoimmune diseases such as rheumatoid arthritis (RA), systemic onset juvenile idiopathic arthritis (JIA), adult-onset Still's disease, Castleman's disease and Crohn's disease. In summary, preliminary clinical results suggest that tocilizumab is effective and generally well tolerated in the treatment of IL-6-related inflammatory autoimmune diseases. Like other anti-cytokine immunotherapies, caution and close monitoring for the adverse events, especially infection, are necessary in subsequent clinical trials.

\*Magnussen CG, Fryer J, \*Venn A, Laakkonen M, Raitakari OT. [Evaluating the use of a portable ultrasound machine to quantify intima-media thickness and flow-mediated dilation: Agreement between measurements from two ultrasound machines.](#) *Ultrasound in Medicine and Biology* 2006;32(9):1323-1329.

Flow-mediated dilation (FMD) and common carotid intima-media thickness (CIMT) are intermediate endpoints for cardiovascular disease. The purpose of this study was to determine whether a portable ultrasound machine was capable of valid measurements of FMD and CIMT compared with a clinic-based machine under similar conditions. Vascular images were taken on 23 apparently healthy young adults with the portable type and clinic type instruments. After analysis it was concluded that the portable ultrasound machine can provide measurements of FMD and CIMT that are highly comparable with measurements obtained from a clinic-based machine under similar clinical conditions.

\*Winzenberg T, \*Shaw K, Fryer J, \*Jones G. [The effects of calcium supplementation on bone density in healthy children: Meta-analysis of randomised controlled trials.](#) *British Medical Journal* 2006; 333(7572):775. *See report on page 3.*

Wood-Baker R, McGlone S, \*Venn A, \*Walters EH. [Written action plans in chronic obstructive pulmonary disease increase appropriate treatment for acute exacerbations.](#) *Respirology* 2006;11(05):619-626.

Chronic obstructive pulmonary disease (COPD) is a progressive disorder characterized by periodic exacerbations. While comprehensive self-management programmes decrease health-care resource utilization, the essential components are unclear. We performed a study of written action plans in the management of COPD. Subjects were recruited from general practices and received an educational intervention with or without an action plan, which usually emphasized prompt treatment with antibiotics and corticosteroids. Subjects were followed up 3-monthly for a year. It was concluded that the use of a written action plan in COPD increased appropriate therapeutic interventions for exacerbations, but this effect was not associated with a decrease in the use of health-care resources.

Dwyer T, Hosmer D, \*Venn A, \*Blizzard L, Blair S, \*Granger R, Shaw J, Zimmet P, \*Cochrane J, Dunstan D. [The inverse relationship between number of steps per day and obesity in a population-based sample - the AusDiab study.](#) *International Journal of Obesity*, 2006.

Physical activity (PA) is inversely associated with obesity but the effect has been difficult to quantify using questionnaires. In particular, the shape of the association has not yet been well described. Pedometers provide an opportunity to better characterize the association. It was found that increasing daily steps were associated with a decline in obesity measures. Pedometer measures of activity indicate that the inverse association between recent PA and obesity is logarithmic in form with the greatest impact for a given arithmetic step number increase seen at lower levels of baseline activity. The findings from this study need to be examined in prospective settings.

\*Granger R, Walters J, Poole PJ, Cates CJ, Lasserson TJ, Mangtani P, Wood-Baker R. [Injectable vaccines for preventing pneumococcal infection in patients with chronic obstructive pulmonary disease.](#) *Cochrane Database of Systematic Review*, 2006.

As chronic obstructive pulmonary disease (COPD) progresses, exacerbations can occur with increasing frequency. One goal of therapy in COPD is to try and prevent these exacerbations, thereby reducing disease morbidity and associated healthcare costs. Pneumococcal vaccinations are considered to be one strategy for reducing the risk of infective exacerbations. This study aimed to determine the safety and efficacy of pneumococcal vaccination in COPD. The primary outcome assessed was acute exacerbations. Secondary outcomes of interest included episodes of pneumonia,

hospital admissions, adverse events related to treatment, disability, change in lung function, mortality, and cost effectiveness. It was determined that there is no evidence from randomised controlled trials that injectable pneumococcal vaccination in persons with COPD has a significant impact on morbidity or mortality. Further large randomised controlled trials would be needed to ascertain if the small benefits suggested by individual studies are real.

Janakiraman N, \*Ding C, \*Jones G, Cicuttini F. [Osteoarthritis and cartilage defects: does size matter?](#) *Current Rheumatology Reviews* 2006;2(4):311-317.

Osteoarthritis is generally thought to be a disease of articular cartilage characterised by the formation of defects. A number of diagnostic and treatment options have been developed to identify and treat these large lesions. There has been evidence of early cartilage changes consisting of 'splints' or 'cracks' which have not received much attention or research in the literature. The clinical relevance of these 'cracks' remains uncertain. Further research is needed to determine if they progress, whether they lead to pain, whether it is possible to accurately diagnose them, whether it is possible or necessary to treat them and whether current grading systems of articular cartilage lesions should include these 'cracks' in their classification systems. This may be particularly relevant in the asymptomatic individual to retard or prevent progression to established osteoarthritis.

\*Schmidt MD, Chasan-Taber L, Pekow P, Freedson P, Markenson G. [Physical activity patterns during pregnancy in a diverse population of women.](#) *Journal of Womens Health* 2006;15(8):911-920.

Participation in physical activity during pregnancy may reduce the risk of gestational diabetes mellitus and preeclampsia and help prevent excess maternal weight gain. However, studies describing patterns and correlates of activity during pregnancy are sparse. The purpose of this cross-sectional study was to describe total physical activity (household/caregiving, occupational, leisure, sports/exercise, and transportation) and correlates of total physical activity in a racially and economically diverse sample of prenatal care patients. It was found that median total energy expenditure (MET-hours/day) was similar among women in the first and second trimesters and was slightly, but not statistically significantly, lower among women in the third trimester. Moderate intensity activity followed a similar pattern and vigorous intensity activity was low among women in each trimester of pregnancy. In terms of activity type, household/caregiving activity was the largest contributor to both total and combined moderate and vigorous intensity energy expenditure among women in each trimester, constituting 24%-40% of total energy expenditure. Results from this study highlight the importance of including household/caregiving and occupational activities in addition to sports/exercise activities in the assessment of total energy expenditure during pregnancy.

\*Menzies researchers.