

Chemotherapy-induced peripheral neuropathy: Determining impacts on cancer survivors

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Identifying Neurological and Functional
Outcomes in Cancer SURvivors Study

Chemotherapy-induced peripheral neuropathy

- CIPN is a major side effect of cancer treatment
- Reduces treatment tolerability
- Leads to long term deficits



Cancer survivors
worldwide

WHAT IS CHEMOTHERAPY-INDUCED PERIPHERAL NEUROPATHY (CIPN)?

It is a debilitating side effect of cancer treatment that may occur when chemotherapeutic agents damage the peripheral nerves that are outside the brain and spinal cord.

CHEMOTHERAPY AGENTS WHICH MAY CAUSE CIPN

- Cisplatin, carboplatin, and oxaliplatin
- Paclitaxel, docetaxel, and cabazitaxel
- Ixabepilone
- Vinblastine, vincristine, vinorelbine, and etoposide
- Thalidomide, lenalidomide, and pomalidomide
- Bortezomib and carfilzomib
- Eribulin



CIPN symptoms begin in the extremities—the hands and feet—and then move upwards.

SYMPTOMS

CIPN affects activities of daily living and quality of life.

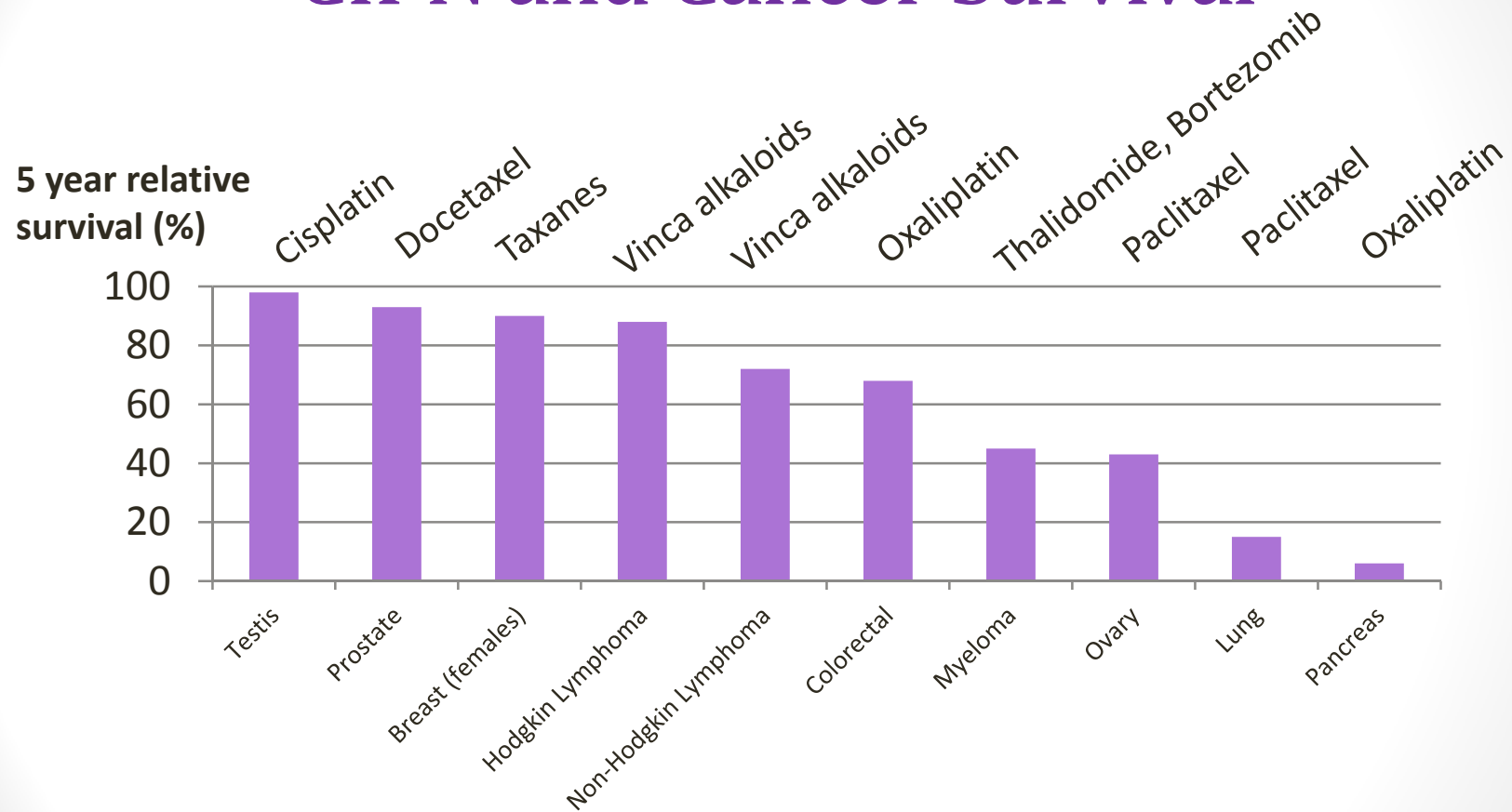
Pain
Burning
Tingling
Numbness
Electric shock
Pins and needles
Temperature sensitivity



This infographic was developed by The Neuropathy Association for September's Pain Awareness Month 2014 with support from DARA BioSciences. For more information, visit www.Neuropathy.org or www.DARABio.com
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 The Neuropathy Association
Empowering us and our loved ones

CIPN and Cancer Survival



Data derived from: AIHW Cancer in Australia: an overview 2014; 5 year relative survival from selected cancers, Australia 2007-2011

Patient Reported Outcomes and CIPN

Ann Hematol
DOI 10.1007/s00277-017-2927-8



ORIGINAL ARTICLE

The magnitude of neurotoxicity in patients with multiple myeloma and the impact of dose modifications: results from the population-based PROFILES registry

Antoinetta J.M. E
Monique C. Mini
Breast Cancer Res Treat (2011) 125:767–774
DOI 10.1007/s10549-010-1278-0

CLINICAL TRIAL

Association between patient reported outcomes and quantitative sensory tests for measuring long-term neurotoxicity in breast cancer survivors Original Article

Dawn L. Hersl
Antai Wang
Deborah Fuen

Long-Term Neurotoxicity Effects of Oxaliplatin Added to Fluorouracil and Leucovorin as Adjuvant Therapy for Colon Cancer: Results from National Surgical Adjuvant Breast and Bowel Project Trials C-07 and LTS-01

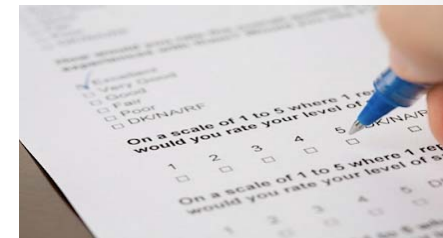
Kelley M. Kidwell^{1,2}; Greg Yothers, PhD^{1,2}; Patricia A. Ganz, MD^{1,3}; Stephanie R. Land, PhD^{1,2}; Clifford Y. Ko, MD^{1,3}; Reena S. Cecchini, PhD¹; Jacek A. Kopec, PhD^{1,4}; and Norman Wolmark, MD^{1,5}

CIPN research gaps

- No method of identifying at-risk patients
- Lacking quantitative and functionally relevant assessment tools
- No effective neuroprotection
- Impact is poorly understood in cancer survivors

- National survey of cancer survivors
- Aim: to address the impact of CIPN on an Australia-wide level
 - Anonymous online survey
 - Inclusion : must have received neurotoxic chemotherapy

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Recruitment Strategy

- National recruitment via:
 - Cancer support and survivorship organisations
 - Social media
 - Research databases
 - Hospitals



The screenshot shows the Cancer Council ACT website. At the top, there are navigation buttons: "Thank you Carolyn from O'Connor for donating \$250.00", "Share your story", "Donate", and "Shop". Below these is a yellow navigation bar with links: "About Us", "Information and Support", "Prevention", "Research", "Fundraising and Events", "Calendar", "Support Us", and "News". The main content area features a post titled "Calling for volunteers for research study" dated 31 May 2016. The text of the post reads: "Researchers at the University of NSW, Australia are seeking volunteers who have received neurotoxic chemotherapy (i.e. chemotherapy that can cause damage to the nerves) for cancer to complete an online survey. Through this survey, we hope to better understand the impact of side effects of chemotherapy on the lives of Australian cancer survivors. The survey is anonymous, and takes around 30 minutes to complete. If you would like to participate in the study please go to the following website: <http://www.infocusstudy.org.au/survey> Or for more information please email: in_focus@unsw.edu.au



The screenshot shows a Facebook post from "Ovarian Cancer Australia" dated June 21 at 10:30am. The post is categorized under "Health & Fitness". The text of the post reads: "VOLUNTEERS: Researchers at UNSW (The University of New South Wales) Australia are seeking volunteers who have received neurotoxic chemotherapy (i.e. chemotherapy that can cause damage to the nerves) as a treatment for cancer to complete an online survey. Through this survey, we hope to better understand the impact of side effects of chemotherapy on the lives of Australian cancer survivors. The survey is anonymous, and takes around 30 minutes to complete.... See More". Below the text is a photograph of a person's hands typing on a laptop. The post title is "National Survey - Chemotherapy Induced Peripheral Neuropathy Research Study - IN FOCUS study". The description below the title reads: "Through this survey, we aim to understand the overall impact of chemotherapy-induced peripheral neuropathy and chemotherapy side effects Australia-wide. #INFOCUSSTUDY.ORG.AU". At the bottom of the post, there are interaction options: "Like", "Comment", and "Share", along with a notification of 15 likes and a "Chronological" sorting option.

Online platform

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IN FOCUS National Survey

Did you experience any of these symptoms (tingling, numbness, pins and needles) **while you were receiving** chemotherapy treatment?

Yes
 No

Please select one ...
I don't know
2016
2015
2014
2013
2012
2011
2010
2009
2008
2007
2006
2005
2004
2003
2002
2001
2000
1999
Please select one ...

...se symptoms (tingling, numbness, pins and needles) **after completing** chemotherapy?

...e symptoms (tingling, numbness, pins and needles) in your hands or feet?

...e symptoms (tingling, numbness, pins and needles) starting?

Have these symptoms (tingling, numbness, pins and needles) improved since you finished your chemotherapy?

Not at all A little bit Somewhat Quite a bit Very Much I am currently receiving chemotherapy

Survey content

Item content	Validated measure
Demographics	
Cancer diagnosis and treatment	
CIPN symptoms	<ul style="list-style-type: none">• FACT/GOG-NTx neurotoxicity subscale• DN4 neuropathic pain measure
Other cancer-related side effects	
Physical activity levels	<ul style="list-style-type: none">• International Physical Activity Questionnaire
Non-cancer health conditions	<ul style="list-style-type: none">• Self-Administered Comorbidity Questionnaire
Quality of Life	<ul style="list-style-type: none">• Short-Form 36 (SF-36)

Results: Demographics

- 431 respondents
- Mean age: 58 ± 9.9 years
- Age range: 21 – 83 years
- 85.4% female

Cancer type	Percentage
Breast cancer	67.8%
Myeloma	10.7%
Colorectal cancer	7.4%
Ovarian cancer	4.6%

Results: Demographics

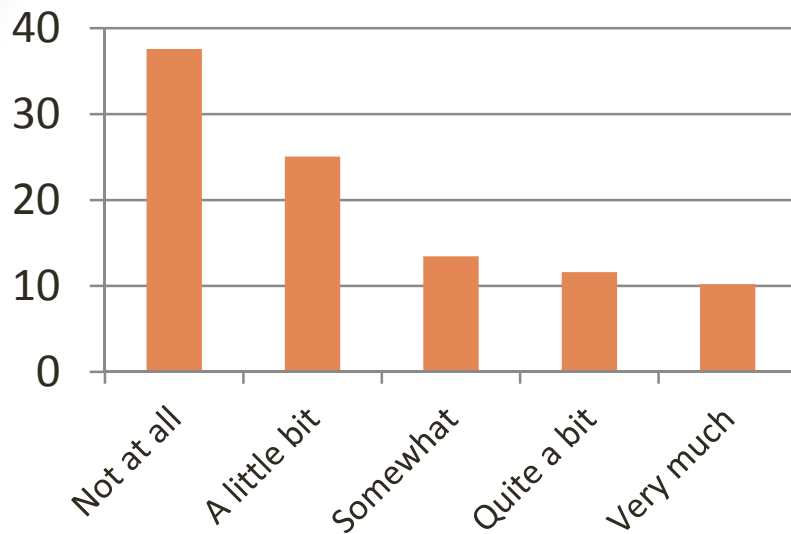
Chemotherapy type	Percentage
Docetaxel	37.1%
Paclitaxel	34.1%
Carboplatin	10.2%
Thalidomide	8.8%
Oxaliplatin	7.9%
Bortezomib	7.7%
Don't know name of chemotherapy	12.1%

Neuropathic Symptoms

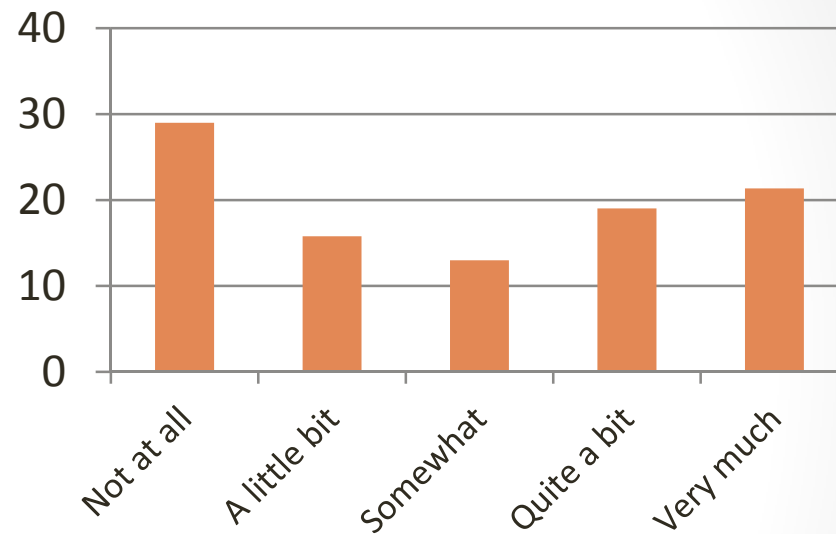
- 80% report CIPN after completing chemotherapy
- Average duration of CIPN: 3.35 ± 3.21 years
- Range of duration of CIPN: <1 year – 22 years

- 74% report currently experiencing CIPN
- 13% have received any treatment for CIPN
- 25% of those with CIPN report no improvement in symptoms since finishing chemotherapy

Neuropathic Symptoms



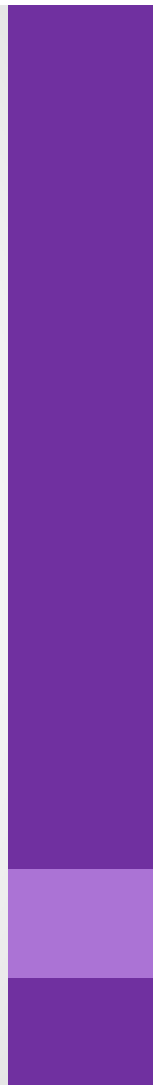
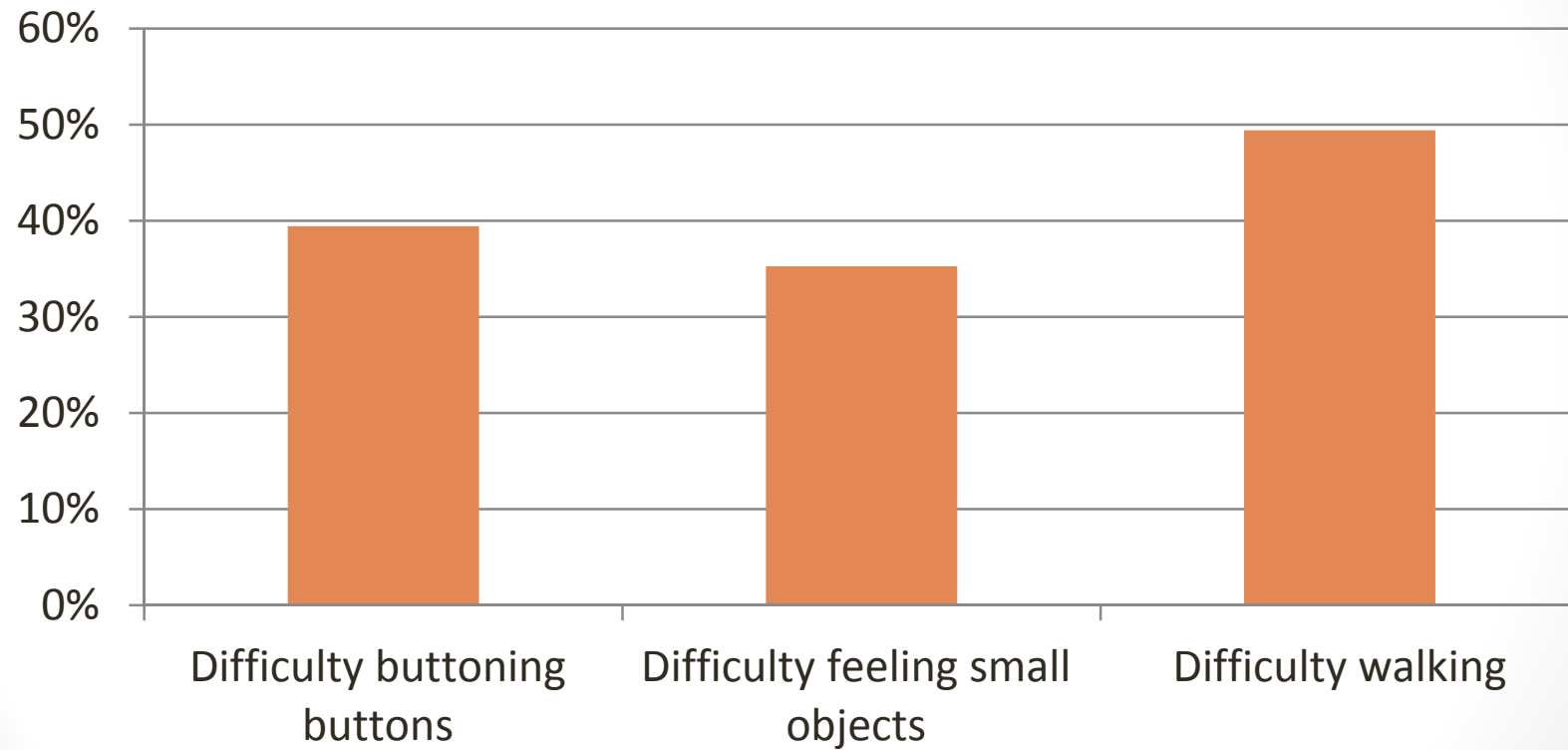
Numbness and tingling in hands (%)
60% experience this symptom to some degree



Numbness and tingling in feet (%)
69% experience this symptom to some degree



Neuropathic Symptoms: Functional Difficulties



Impact of chemotherapy side effects

Side effect	% rating: biggest impact
Fatigue	42.9%
CIPN	21.8%
Pain	13.0%
Insomnia	9.7%
Changes in sexual function	9.7%
Anxiety	9.1%

Impact of CIPN

- Respondents with CIPN had lower QoL (SF-36 total score; $p < 0.001$)
 - Physical Functioning ($p < 0.001$)
 - Bodily Pain ($p < 0.001$)
 - General Health ($p < 0.001$)
 - Vitality ($p = 0.001$)
- 57% of participants were 'limited a lot' in undertaking vigorous physical activity
 - Those with CIPN had scores indicating greater limitations ($p < 0.01$)
- CIPN has an impact on QoL, across domains associated with poorer physical health and energy levels

Conclusions

- CIPN has a significant impact on cancer survivors
 - Experienced by a significant percentage of those who receive neurotoxic chemotherapy
 - Breast cancer survivors are a major group who experience CIPN
 - Symptoms often last for years
 - A proportion of respondents see no improvement in symptoms with time
 - Affects QoL across a range of domains
 - Lasting impact supports need for further research into assessment, prevention and treatment
- Survey runs until mid 2018
- Survey link: <http://www.infocusstudy.org.au/survey/>
- Facebook: www.facebook.com/infocus.study

Acknowledgements

- Dr Susanna Park
- Prof David Goldstein
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 - Cancer Institute New South Wales
 - National Health & Medical Research Council

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- Survey link: <http://www.infocusstudy.org.au/survey/>
- Facebook: www.facebook.com/infocus.study